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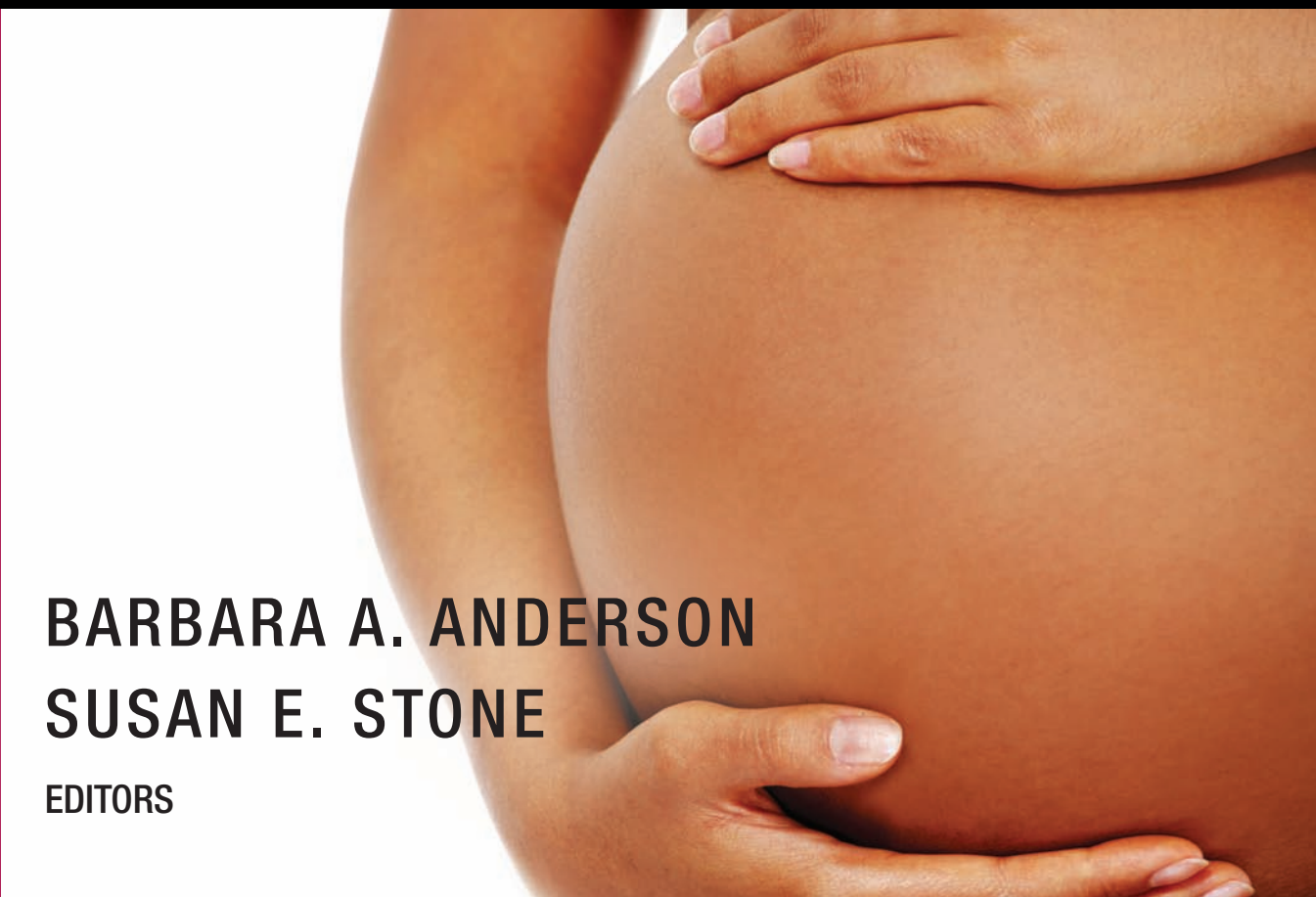
BEST PRACTICES IN MIDWIFERY

USING THE EVIDENCE TO IMPLEMENT CHANGE



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Best Practices in Midwifery

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Best Practices in Midwifery

Using the Evidence to Implement Change

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SPRINGER PUBLISHING COMPANY
NEW YORK

Springer Publishing Company, LLC
11 West 42nd Street
New York, NY 10036
www.springerpub.com

Acquisitions Editor: Margaret Zuccarini
Production Editor: Michael O'Connor
Composition: Absolute Service, Inc.

ISBN 978-0-8261-0885-2
E-book ISBN: 978-0-8261-0886-9

12 13 14 15 / 5 4 3 2 1

Library of Congress Cataloging-in-Publication Data

Best practices in midwifery : using the evidence to implement change / Barbara A. Anderson, Susan E. Stone, editors.
p. ; cm.
Includes bibliographical references and index.
ISBN 978-0-8261-0885-2 — ISBN 978-0-8261-0886-9 (e-ISBN)
I. Anderson, Barbara A. (Barbara Alice), 1944- II. Stone, Susan E.
[DNLM: 1. Midwifery—methods—United States. 2. Nurse Midwives—United States. 3. Evidence-Based Nursing—United States. 4. Labor, Obstetric—United States. 5. Obstetric Labor Complications—United States. WY 157]

618.200973—dc23

2012020057

Printed in the United States of America by Bang Printing.

To all midwives who, every day, are with woman;
helping childbearing women to make the best decisions
for themselves and their families.

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Foreword

Applying best evidence in the care of women and their infants is a cornerstone of midwifery practice. The challenge of evidence-based practice (EBP) is to know how to find the evidence, appraise its worth and applicability, and assure that each woman understands what it means so that it can inform her decision making. This book provides a well-rounded examination of the issues we face in using evidence to inform our everyday clinical decisions.

Over the past several decades, maternity care has admirably moved away from opinion-based practice to careful consideration of scientific evidence in clinical decision making. However, over time, as is often the case with practice trends, recommendations can become dogma.

EBP, in its earliest days out of Oxford, England, was a visionary formula comprising three pillars: (a) the best available evidence; (b) professionals' skills, expertise, and judgment; and (c) the needs and preferences of patients and families (Evidence-Based Medicine Working Group, 1992; National Health Service [NHS] Executive, 1999). However, the first pillar has too often superseded the others—science can trump women's knowledge of their bodies and/or clinicians' confidence in their skills. In isolation, each pillar in the triad is weaker compared to its collective power. I would argue that it is the dynamic interaction of the three pillars that makes EBP greater than the sum of its parts. Science is constantly producing new knowledge. That knowledge is open to interpretation by clinicians and women. Our job and challenge is to balance these perspectives.

The authors in this book have gathered current evidence and created practice scenarios to help the reader visualize EBP in action. Topics include place of birth, how to care for women throughout labor, and support of mental health, among many others. The novice or expert reader will have to place the summary of evidence into the clinical setting—what does it mean for their specific practices? The content can be used to strengthen and, when needed, change practice.

Midwives sometimes find themselves in clinical settings where their translation of evidence is not always accepted, where opinion-based care presides (by all types of clinicians). Kotaska argues for each of us to "find concrete, easily understandable examples that appeal to clinicians' and patients' common sense" (Klein, Enkin, Kotaska, & Shields, 2007, p. 266). For example, when "tethering" and "untethering" are described in this book, the visual interpretation helps the reader understand how old practices, poorly grounded in science, shackle our ability to care for women.

EBP is only effective when the clinician stays abreast of latest relevant scientific findings and evaluates how to translate them into practice. At the same time, the clinician draws on individual clinical experience and team experience. Not everything

important to practice can be evaluated in a randomized clinical trial or applied to every setting. Finally, each woman deserves to understand what the evidence means for her personal clinical situation and to be supported in her decisions. Our job is to provide unbiased evaluation and recommendations based on our understanding of the evidence, our skills, and the resources in our practice settings. We have the ethical responsibility to skillfully advocate for change of outdated and/or harmful practices. Above all, we must respect a woman's autonomy and assure that her voice represents an equal part of the EBP triad (Klein et al., 2007).

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REFERENCES

Evidence-Based Medicine Working Group. (1992). Evidence-based medicine: A new approach to teaching the practice of medicine. *The Journal of the American Medical Association, 268*(17), 2420–2425.

Klein, M. C., Enkin, M. W., Kotaska, A., & Shields, S. G. (2007). The patient-centered (R)evolution. *Birth*, *34*(3), 264–266.

National Health Service Executive. (1999). *What is evidence-based health care?* Unit 1. Critical Skills Appraisal Programme and Health Care Libraries Unit: Oxford.

Preface

Maternal–infant health in the United States is in crisis. Huge financial resources are devoted to care; yet maternal mortality, life-threatening maternal morbidity, preterm birth, and low birth weight are all very high. Outcomes for mothers and infants in America are the worst among high-income nations. In spite of efforts over the past 30 years to improve health care disparity among childbearing women, to provide available and accessible primary health care, and to avert complications through early intervention, outcomes have worsened. Poor health indicators among mothers and infants plague our nation. Many concerned voices are calling for change to evidence-based policy and practice in the care of childbearing women and their infants. The Institute of Medicine has led the discussion recommending strategies to promote evidence-based practices, including disseminating knowledge about deficits in the maternity care system and the need for care grounded in scientific evidence (Sakala & Corry, 2008).

When we began discussing this book, these facts were foremost in our minds. Maternity care in the United States needs to change. Nurse-midwives are key players. Both historically and in contemporary society, they challenge practices and advocate for the use of scientific evidence in the clinical setting. Through the Core Competencies for Midwifery Education and Standards for the Practice of Midwifery, nurse-midwives are grounded in an educational framework that espouses the normalcy of birth and the need for collaborative care models in improving quality of care.

This book is about controversial issues in the care of childbearing women in the United States. It examines various levels of evidence for existing practices, describes the effects of these practices on maternal and infant outcomes, and provides guidance on evidence-based best practices in nurse-midwifery care. It aims to provide a road map for nurse-midwives who strive to move unsubstantiated maternity care practices toward an evidence-based model.

There is no current book published in the United States that discusses evidence-based best practices for nurse-midwives around the most controversial areas of practice. With that point in mind, Springer Publishing Company approached Kitty Ernst, CNM, MPH, DSc (HON), and Mary Breckinridge, Chair of Midwifery at the historical Frontier Nursing University, about preparing such a book. Frontier Nursing University accepted this challenge. Written by alumni and faculty at Frontier Nursing University, this work examines 15 controversial topics from the perspectives of evidence-based best practices and strategies for changing clinical environments. Each chapter presents an exemplar case study.

The book is targeted toward practicing certified nurse-midwives, maternity care nurses and physicians, certified midwives, graduate students in midwifery and family nursing, doctoral students examining practice issues, nursing faculty teaching maternity nursing, and undergraduate nursing students. While we focus on

best practices for nurse-midwives, we embrace the contributions of all of our colleagues engaged in working with mothers and infants and offer our suggestions to all concerned for practices that support normal birth.

The editors and contributors are pleased to donate all royalties from this work to the scholarship fund for nurse-midwifery students at Frontier Nursing University. We would like to acknowledge the alumna and faculty who have graciously contributed their knowledge in writing this book. We would also like to acknowledge Rebeca Barroso, CNM, DNP, and Frances Sparti, FNP, DNP, from Frontier Nursing University, for their invaluable assistance and professional knowledge in the editing phase of this book. We also appreciate the editing work of Jacalyn Carfagno. Our gratitude to Margaret Zuccarini and the editorial staff at Springer Publishing Company, for their faith in our mission and their enthusiasm for this book.

Lastly, we acknowledge Mary Breckinridge, the founder of both the Frontier Nursing Service in Hyden, Kentucky and the Frontier Graduate School of Midwifery, today known as Frontier Nursing University. Mrs. Breckinridge developed a model of rural primary health care, family nursing, and nurse-midwifery that set a standard for the nation. Over the years since the Frontier Nursing Service was founded in 1925, the nurse-midwives of the Frontier Nursing Service have served the women of rural Eastern Kentucky, one of the most economically depressed areas in the nation. They have also carried the mission of midwifery care across the nation and the world.

One of Mrs. Breckinridge's dreams was that the nurse-midwives from Frontier Nursing University would share their knowledge through the written word. In her autobiography, *Wide Neighborhoods: A Story of the Frontier Nursing Service* (Breckinridge, 1952), she describes the need for an educational text by and for American nurse-midwives. As a visionary and organizer, Mrs. Breckinridge led a highly productive life, leaving this dream to those who followed.

While today there are many texts written by and for nurse-midwives, this text is unique in its approach. Frontier Nursing University, the birthplace of nurse-midwifery in America, is honored to build on the foundation that Mary Breckinridge laid. We offer a contemporary text addressing best practices and strategies for change for nurse-midwives and other clinicians who face on a daily basis controversial and often scientifically unsubstantiated approaches in the care of the mothers and infants in our nation.

Barbara A. Anderson and Susan E. Stone
Editors

REFERENCES

American College of Nurse-Midwives. (2002). *Core competencies for basic midwifery practice*. Retrieved from http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000000050/Core%20Competencies%20June%202012.pdf

Breckinridge, M. (1952). *Wide neigborhoods: A story of the frontier nursing service*. Lexington, KY: The University Press of Kentucky.

Sakala, C., & Corry, M. P. (2008). Achieving the Institute of Medicine's six aims for improvement in maternity care. *Women's Health Issues*, *18*(2), 75–78. http://dx.doi.org/10.1016/j.whi.2007.12.001.

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Evidence-Based Maternity Care: The External Environment

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Evaluating and Using the Evidence

1

Billie Anne Gebb, Zach G. Young, and Barbara A. Anderson

THE HIERARCHY OF EVIDENCE

In their seminal 1996 article, published in the *British Medical Journal*, Sackett, Rosenberg, Gray, Haynes, and Richardson defined evidence-based medicine (EBM) as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (para. 2). Sackett, Straus, Richardson, Rosenberg, and Haynes proposed a simpler definition in 2000: "Evidence-Based Medicine is the integration of best research evidence with clinical expertise and patient values" (p. 1). The concept of EBM was introduced "to provide a framework, methodological approach, and set of skills to enable clinicians to more effectively access clinically relevant research" (Perry & Kronenfeld, 2005, p. 3). The theory has since evolved into evidence-based health care (EBHC) because other health care fields, including nursing, have adopted the model (Perry & Kronenfeld, 2005). The methodology relies upon a series of steps to improve health care delivery and outcomes:

1. Identifying a clinical problem;
2. Formulating a focused, answerable question;
3. Locating relevant and appropriate resources;
4. Searching for information;
5. Critically appraising the information; and
6. Implementing in clinical practice.

Performing these steps and implementing the theory of EBM can be considered evidence-based practice (EBP; Perry & Kronenfeld, 2005; Scott & McSherry, 2008). EBM, EBHC, and EBP are often used interchangeably; although many argue that they are not exactly the same (Scott & McSherry, 2008). Likewise, many specialty areas of health care have adopted the evidence-based model to refer to their specialty, such as evidence-based health promotion (Scott & McSherry, 2008). Nursing is one of several health care fields that have embraced the use of evidence in clinical decision making.

There is a substantial argument for a separate definition of *evidence-based nursing* (EBN). Scott and McSherry (2008) performed an extensive literature review to explore definitions of EBN. The authors synthesized the results to create this definition: "an ongoing process by which evidence, nursing theory and the practitioners' clinical expertise are critically evaluated and considered, in conjunction with patient involvement, to provide delivery of optimum nursing care for the individual" (p. 1089). EBN differs from EBM in that EBN puts much more emphasis on patient involvement and also includes qualitative research (Scott & McSherry, 2008).

In an editorial in *Women and Birth*, Fahy (2008) calls for a more expansive definition of evidence and EBP for nurse-midwives. She advocates that EBP should include evidence of *appropriateness*, *meaningfulness*, and *feasibility;* mirroring the definition from the Joanna Briggs Institute (JBI; 2011a), an international collaboration that provides reliable evidence for nursing, allied health, and medical professionals.

Kronenfeld et al. (2007) point out that nurse-midwives and other advanced practice nurses, in their role as direct care providers, may approach EBP in a manner more similar to physicians. However, nurse-midwives bring elements of nursing care to their patients. Nurse-midwives performing EBP may elect to forge their own definition of evidence-based nurse-midwifery.

Although there may not be a clear agreement on terminology relating to EBP, all definitions include some form of research and utilization of evidence (Scott & McSherry, 2008). EBP is predicated on finding and evaluating evidence. So, what is considered evidence? It most often refers to research studies but can also include anecdotes and personal experience. Generally, evidence is organized into a hierarchy; with the highest quality evidence at the top and less reliable types of information on the bottom. The highest quality evidence comes from studies that are least prone to threats to internal validity. Studies at the bottom of the hierarchy are more susceptible to those threats (Ho, Peterson, & Masoudi, 2008; Trustees of Dartmouth College and Yale University, 2006; see Figure 1.1).

Systematic Reviews

Systematic reviews are at the top of the evidence hierarchy. Many articles may be called review articles, but a systematic review is an overview of all primary studies on a given topic. A systematic review contains a statement of objectives, materials, and methods and must be conducted in a way that is explained explicitly and can be reproduced (Greenhalgh, 2001). The Center for Outcomes Research and Education (CORE; 2011) describes a systematic review as "a thorough, comprehensive, and explicit way of interrogating the medical literature" (para. 2). Performing a systematic review is a multistep process. It begins with a stated objective of answering a clinical question, searches for studies, selects which studies to include based on inclusion and exclusion criteria, and summarizes the data in a standardized format (CORE, 2011; Greenhalgh, 2001).

Meta-Analyses

At the same level as systematic reviews on the evidence hierarchy are meta-analyses. Meta-analyses combine the statistical data from the individual studies into a

FIGURE 1.1

The hierarchy of evidence.

systematic review and recalculate the statistical tests to provide further study of the topic. Meta-analyses are based on systematic reviews, but not all systematic reviews become meta-analyses (CORE, 2011; Greenhalgh, 2001).

Critical Appraisal

Next on the evidence hierarchy are critically appraised topics and articles. These are short summaries created to answer a specific clinical question (Centre for Evidence Based Medicine, 2011). Critically appraised topics can be found in a number of evidence-based, point-of-care research tools and also in journal summaries.

Randomized Controlled Trials

Another high-quality evidence type is the randomized controlled trial (RCT). In the RCT, patients or research subjects are randomly assigned to either receive treatment or serve as a control. Because the subjects are assigned randomly, other variables do not come into play; any difference in outcomes between the two groups can be attributed to the intervention (Ho et al., 2008).

COHORT AND CASE-CONTROL STUDIES

Below RCTs in the hierarchy of evidence are cohort and case-control studies. These studies follow particular groups of people over time. A cohort study follows two groups of patients: one group with a certain condition or intervention and the second group without the condition or intervention. Outcomes from the two groups are compared (SUNY Downstate Medical Center, 2004b). Case-control studies are similar in that they also compare a group with a certain condition

or intervention to a group without that condition or intervention, but the groups are not followed over time. Comparisons are derived from the histories of the study participants (SUNY Downstate Medical Center, 2004a).

Consensus Statements

Consensus statements often provide guidelines issued by professional organizations. The main purpose of these guidelines is to make evidence-based standards both clear and accessible and to facilitate clinical decision making (Greenhalgh, 2001). For instance, the American College of Obstetricians and Gynecologists (ACOG) issues Practice Bulletins, which are subtitled as "Clinical Management Guidelines for Obstetrician-Gynecologists." The American College of Nurse-Midwives (ACNM) produces clinical bulletins. Nurse-midwives may also be interested in the clinical practice guidelines from the American Academy of Pediatrics (AAP). Derived from consensus statements, these guidelines are verified data that may be published in textbooks, journals, or online.

Anecdotal Information

Anecdotal information is the least reliable source because it cannot be verified. However, it does provide a rich description of experience. It builds on the bank of experiences that clinicians have and often corroborates best practices. However, a higher level of evidence must verify these practices.

SEARCHING FOR THE EVIDENCE

Finding evidence is an integral part of EBP. Although there may be many different types of knowledge acquisition, searching electronic resources such as bibliographic databases is essential in finding the best evidence. Searching was once the realm of librarians, who would deliver the results to clinicians. With the advent of the Internet, end user searching has become more prevalent (Perry & Kronenfeld, 2005). Today, it is common for clinicians to do their own searching. Indeed, it is an important time- and labor-saving skill. It is essential for evidence-based nurse-midwifery care that clinicians possess skills to find and analyze information. Systematic reviews, critically appraised topics, and RCTs are generally published in professional journals. The traditional bibliographic databases index these articles to facilitate discovery. Database vendors create a record for each article, which contain all the pertinent information (title, author, etc.). The records are then stored electronically and are machine read, so they can be searched by elements in the record.

Search Strategy

Searching for the evidence begins with formulating a comprehensive search strategy. The first step in a search strategy should be forming a clinical question. Rather than searching broad topics, an evidence-based search strategy attempts to answer a focused, answerable question. For example, rather than search for information on

morning sickness, a nurse-midwife might ask, "Does ginger decrease the severity of symptoms for women experiencing nausea and vomiting in pregnancy?"

To help build a question, practitioners can use a framework referred to as PICO, where:

P = patient, problem, or population
I = intervention
C = comparison
O = outcome

Using the PICO framework to search has been shown to increase the percentage of relevant results (Schardt, Adams, Owens, Keitz, & Fontelo, 2007). Applied to the preceding example, the framework results in:

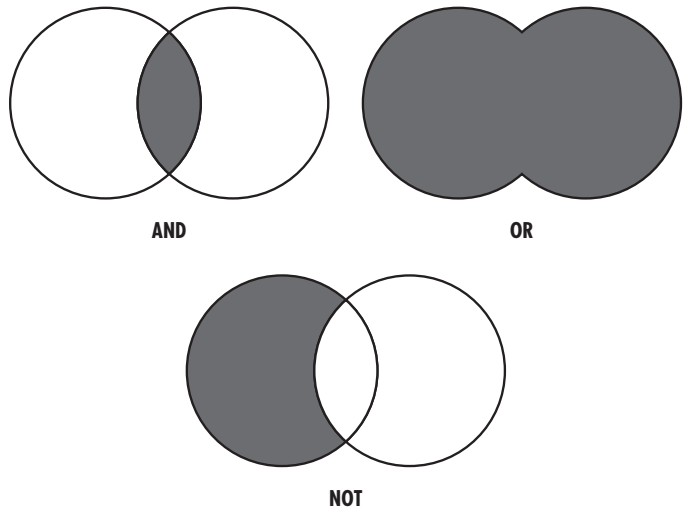
P = pregnant women
I = consumption of ginger
C = no intervention
O = decrease in symptoms, severity, adverse effects

Words from the PICO framework and their synonyms become keywords or important words used to search (Reitz, 2007). Keywords are combined with Boolean operators. *Boolean* refers to a system of logic developed by mathematician George Boole and is commonly used in algebra. There are three commands or operators used in this logic. The operators tell the database how to combine terms. The operators are

AND—includes both terms,
OR—includes either term, and
NOT—excludes terms (see Figure 1.2).

FIGURE 1.2

Venn diagram example.



The search for keywords can be limited to certain fields. A *field* is an individual piece of information contained within a record (Walker & James, 1993). Examples of common fields are title, author, source, and subject. Searching can be limited to look for terms only within the title of a work or only within an abstract. This feature is especially helpful when the citation is already known.

Subject Headings

Perhaps the most important tool for the searcher is subject headings. Most databases use subject headings, or a thesaurus, for indexing and specialized searching. Subject headings compose a list of preferred terms that a cataloger or indexer must assign to the record of a work. In this way, the terms are a controlled vocabulary. They indicate the content of the work in a catalog or database (Reitz, 2007). This process standardizes the terminology. For example, if the subject heading for teenagers is "adolescents," then an article titled "Dealing With Your Teenager" will have the subject heading of "adolescents," even though that term is not used in the article. Subject headings can also be used as a search access point.

Subject headings are specific to each database and based on the terminology of the discipline. Subject headings for individual databases are discussed later in this chapter. However, the standard subject headings for health care disciplines are the Medical Subject Headings (MeSH). MeSH is the controlled vocabulary thesaurus created and maintained by the National Library of Medicine (NLM). MeSH terms are arranged in a hierarchical structure from general, broad headings to more specific, narrow headings. As of 2011, there were 26,142 descriptors in MeSH. These terms are continually revised and updated, and searchers may suggest new terms (U.S. National Library of Medicine, 2011a).

Searching with these terms involves choosing the best terms from the list of subject headings. When searching for a term within a database's thesaurus, searchers will be presented with the term in such a way that its hierarchical relationship with other terms is shown. Therefore, the searcher can instantly see what terms are more general (broader) and which are more specific (narrower). If the term selected is not a subject heading, the preferred term will be suggested. In addition, a subject term will also list all other comparable or related terms. Subject headings usually include a *scope note*; that is, the term's intended use in the database (Reitz, 2007). The scope note assures the searcher of the term's meaning or alerts the searcher that the database infers a different meaning. For example, the scope note for the MeSH term "young adult" is "a person between 19 and 24 years of age" (U.S. National Library of Medicine, 2011e). If the searcher wishes to include persons at age 25, the searcher will need to use the MeSH term "adult" instead. Subject headings are particularly useful for alternate spellings. For example, using the preferred term "labor" will also retrieve articles that use "labour." They also eliminate the need to search for multiple variations of the same term. Postpartum depression may also be referred to as postnatal depression, but using the preferred term will retrieve articles that use either term. When the correct subject headings have been identified and selected, those terms can be added to the search. Most databases will run the search automatically, retrieving records with the chosen terms.

Limiters

Limiters are also very useful tools when searching for evidence-based articles. Limiters allow searchers to set certain parameters on their search results. A very common limiter is the date of publication. For instance, the searcher can elect to retrieve only articles published in the last year or last 5 years. Health care databases often include limiters associated with EBP, for example, RCTs. Limiters are essential for the best search strategy. However, the more limiters placed on a search, the smaller the number of results. It may be preferable to start with a broader search and then apply limiters as needed.

Indexing

The key to the search and retrieval process is proper indexing and maintaining of databases. An indexer reads an article to determine subject and content and then assigns appropriate headings (Reitz, 2007). The standards for indexing of databases require indexers who are well prepared. For example, indexers for the NLM minimally hold a bachelor's degree in a biomedical science (U.S. National Library of Medicine, 2011c). The computerized systems used by the indexers are programmed to guard against misspellings and other errors (U.S. National Library of Medicine, 2011b). Databases include criteria regarding which journals are indexed. A list of the publications indexed is usually available within each database.

DATABASES FOR EVIDENCE-BASED NURSE-MIDWIFERY PRACTICE

Large-scale bibliographic databases house most evidence-based information. For nurse-midwifery, the most relevant databases are MEDLINE and the Cumulative Index to Nursing and Allied Health Literature (CINAHL).

MEDLINE

Consisting of more than 20 million journal article and book citations, MEDLINE is the largest index of biomedical literature in the world (U.S. National Library of Medicine, 2011e). Items indexed in MEDLINE are assigned the MeSH controlled vocabulary. MEDLINE can be searched through both free and paid interfaces. PubMed is a free search interface for MEDLINE created by the NLM (U.S. National Library of Medicine, 2011d). Users of PubMed are granted extensive customization options using a service called "MyNCBI." Using MyNCBI within PubMed allows users to save search limiters, to run searches for chronological time intervals, and store user-created bibliographies. PubMed has also released a mobile version of its website, allowing users to conduct basic MEDLINE searches from their smart phones.

HubMed is a free version of MEDLINE. HubMed allows users to export citations directly into popular citation management software, create a Really Simple Syndication (RSS) feed for search results, and map keyword occurrence over a time. MEDLINE is also available through paid subscriptions from vendors such as OVID and EBSCOhost.

CINAHL

CINAHL is an online research database published by EBSCOhost. With around 3 million citations, including nursing journals, books, multimedia, dissertations, and conference proceedings, CINAHL provides a robust index for nurse-midwives. CINAHL is accessed through the EBSCOhost interface, which provides the My EBSCOhost tool. Using this tool, searchers are able to save and share citations, create RSS feeds of searches, and save searching preferences. Articles are indexed in CINAHL using the CINAHL Headings controlled vocabulary. An EBSCOhost mobile application (app) for iPhones and iPod touches allows CINAHL searches.

The Cochrane Collaboration

Other databases specifically index and house clinical evidence. The Cochrane Collaboration is the leader in this area. It produces the Cochrane Library, which includes the Cochrane Database of Systematic Reviews (CDSR), the Cochrane Central Register of Controlled Trials (CENTRAL), the Database of Abstracts of Reviews of Effects (DARE), the Cochrane Methodology Register, the Health Technology Assessment Database, and the National Health Service Economic Evaluation Database (NHS EED). Updated monthly, the CDSR, containing Cochrane Reviews, is the leading resource for systematic reviews in health care. Cochrane Reviews are prepared by one of the 53 Cochrane Review groups. Each of these groups focuses on a specific topic area and is responsible for editorial support and peer review; for example, pregnancy and childbirth (The Cochrane Library, 2011a). Abstracts of Cochrane Reviews are freely available. Many countries, as well as the state of Wyoming, have a provision or subscription to the full library. Elsewhere in the United States, the Cochrane Library is available as a subscription from John Wiley & Sons (The Cochrane Library, 2011b).

The Joanna Briggs Institute

The Joanna Briggs Institute (JBI), housed at the University of Adelaide, Australia, is similar to the Cochrane Collaboration but with more focus on nursing. JBI databases include JBI Library of Systematic Reviews, Best Practice Information Sheets, Evidence Summaries, and Evidence-Based Recommended Practices. A limited amount of information is free, with other information available to members of the Institute via JBI ConNect+ (Clinical Online Network of Evidence for Care and Therapeutics; JBI, 2011b, 2011c). ProQuest's Nursing and Allied Health Source database indexes Evidence Summaries, Systematic Reviews, and Best Practice Information Sheets from JBI (ProQuest, 2011).

Meta-Search Engines

Meta-search engines have been created to search multiple evidence sources simultaneously. SUMsearch (http://sumsearch.org) searches the National Guideline Clearinghouse (NGC), MEDLINE, and DARE simultaneously for systematic reviews, original studies, and practice guidelines (Crom, 2007). The TRIP database (http://www.tripdatabase.com) is a clinical search engine designed to help clinicians answer

questions quickly with the best available evidence (TRIP database, 2011). It searches hundreds of evidence-based resources, such as practice guidelines from around the world, patient information, and e-books. An advisory board of experts oversees the admission of resources to ensure accuracy of content (TRIP database, 2011).

Point-of-Care Tools

Evidence-based information is often needed very quickly. A new generation of databases and other information resources has been created to fill this need. These resources summarize and organize the vast body of clinical literature into electronic, easily readable formats. They are designed to be used at the bedside and are often referred to as point-of-care tools (Ketterman & Besaw, 2010). The advent of mobile computing devices has greatly accelerated the use of these tools and has given clinicians immediate access to information. The increasing use of smart phones exemplifies this trend. Drug reference software such as Epocrates, LexiComp, and Micromedex were some of the first resources to use handheld platforms.

Widely used, *UpToDate* was one of the first point-of-care tools available to clinicians. Currently owned by Wolters Kluwer Health, *UpToDate* provides an overview of clinical topics. The product includes more than 8500 topics in 17 health care specialties written by expert clinicians. Updates to *UpToDate* are released every four months (UpToDate, Inc., 2011a). *UpToDate* has a mobile web page for smart phone users with apps for iPhone, iPad, Android, and Android tablets (UpToDate, Inc., 2011b).

DynaMed is published by EBSCOhost and provides clinically organized summaries for more than 3200 topics. It is updated daily (EBSCO Publishing, 2011). A board of health care professionals produces content following a seven-step, evidence-based methodology for including and updating content (EBSCO Publishing, 2010b). References are assigned levels in the hierarchy of evidence. This hierarchy includes the quality and source of the evidence. Level 1 is considered reliable evidence, Level 2 is mid-level evidence, and Level 3 is lacking direct evidence (EBSCO Publishing, 2010a). These levels allow quick assessment of the best available evidence within a topic. Recommendations not assigned with an evidence level based on the underlying source are labeled with an evidence grade. Grade A is consistent high-quality evidence, Grade B is inconsistent or limited evidence, and Grade C is lacking direct evidence (EBSCO Publishing, 2010a). *DynaMed* provides a mobile application that runs through the Skyscape app and is compatible with most mobile platforms. Ketterman and Besaw (2010) compared *UpToDate* and *DynaMed* and found that the currency of updates was the major difference between the two tools. *DynaMed* has more current updates, but *UpToDate* has more references per topic. The authors suggest using multiple databases for answering clinical questions.

Essential Evidence Plus (*EE+*), formerly known as *InfoRetriever*, is produced by John Wiley & Sons, Inc. In addition to Essential Evidence Topics (background, diagnosis, treatment), users can simultaneously search other databases such as EBM Guidelines, CDSR, NGC Guidelines, and Decision Support Tools. EE+ contains Patient Oriented Evidence that Matters (POEMs) Research Summaries that synopsize new evidence. An alerting service e-mails this evidence to the user daily. Every recommendation in the database is given a strength-of-evidence rating (Essential Evidence Plus, 2011a, 2011b). There is a mobile-friendly version of the EE+ website.

Natural Standard is an evidence-based resource for complementary and alternative therapies. Information contained within *Natural Standard* is given a letter grade (A, *strong positive scientific evidence*, through F, *strong negative scientific evidence*) based on the amount and quality of data available on the topic (Natural Standard, 2011). *Natural Standard* also provides a mobile application through Skyscape.

Searching for evidence-based information is a best practice skill in providing nurse-midwifery care. Developing a search strategy and accessing resources, often at the point of care, can ultimately lead to better patient outcomes.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 1.1

Oral Health in Late Pregnancy: Finding the Evidence

Justin, CNM, practices full-scope nurse-midwifery in a rural, underserved low-income community where the preterm birth rate is very high, and women frequently do not access prenatal care until well into the second trimester. He always does an oral health assessment as part of his initial examination of a new pregnant patient, and he has noted a high prevalence of multiple dental caries among many of these women.

Justin has read about the link between preterm birth and poor oral health. He has observed the high incidence of preterm labor among this population. Armed with his clinical observation and search skills, he decided to explore the evidence. First he formulated focused, answerable questions: "What are the evidenced-based best practices for treating multiple dental caries during late second trimester pregnancy?"

He then searched for the evidence and evaluated it according to the hierarchy of evidence. Using MeSH, he identified subject headings (dental caries, pregnancy, preterm birth, second trimester) and used limiters (publications in the past 5 years) in major databases, including MEDLINE and the Cochrane Library.

His smart phone with apps enhanced his influence by allowing him to search for and disseminate information at point of care, such as in the clinic or at the local hospital where he attends the births of his patients. With smart phone in hand, he is able to educate not only his patients but also the physicians and nurses with whom he works.

Exemplar of Best Practice

Using his essential knowledge in problem identification, accessing databases, and evaluating best practices according to the hierarchy of evidence, Justin offers his pregnant patients and his colleagues the best information on the management of oral health during late pregnancy. He is respected by his colleagues for his ability to obtain and apply accurate and timely information.

REFERENCES

Center for Outcomes Research and Education. (2011). *What is the difference between a "systematic review" and a "meta-analysis"?* Retrieved from http://researchcore.org/faq/answers.php?recID=5

Centre for Evidence Based Medicine. (2011). *Glossary*. Retrieved from http://www.cebm.net/index.aspx?o=1116

The Cochrane Library. (2011a). *About the Cochrane Library*. Retrieved from http://www.thecochranelibrary.com/view/0/AboutTheCochraneLibrary.html

The Cochrane Library. (2011b). *Free online access through funded provisions*. Retrieved from http://www.thecochranelibrary.com/view/0/HowtoOrder.html

Crom, V. (2007). SUMsearch. *Journal of the Medical Library Association*, *95*(4), 471–473. http://dx.doi.org/10.3163/1536-5050.95.4.471

EBSCO Publishing. (2010a). *Content/editorial policies: Levels of evidence*. Retrieved from http://dynamed.ebscohost.com/content/LOE

EBSCO Publishing. (2010b). *Content/editorial policies: 7-step evidence-based methodology*. Retrieved from http://www.ebscohost.com/dynamed/content.php

EBSCO Publishing. (2012). *DynaMed Overview*. Retrieved from http://dynamed.ebscohost.com/about/about-us

Essential Evidence Plus. (2011a). *Essential Evidence Plus user guide (institutional)*. Retrieved from http://www.essentialevidenceplus.com/resources/EEP_guidebook_inst.pdf

Essential Evidence Plus (2011b). *Features: Resources & tools*. Retrieved from http://www.essentialevidenceplus.com/product/features_ir.cfm

Fahy, K. (2008). Evidence-based midwifery and power/knowledge. *Women and Birth*, *21*(1), 1–2.

Greenhalgh, T. (2001). *How to read a paper: The basics of evidence-based medicine* (2nd ed.). London, United Kingdom: BMJ Books.

Ho, P. M., Peterson, P. N., & Masoudi, F. A. (2008). Evaluating the evidence: Is there a rigid hierarchy? *Circulation*, *118*(16), 1675–1684.

The Joanna Briggs Institute. (2011a). *About us*. Retrieved from http://www.joannabriggs.edu.au/About%20Us

The Joanna Briggs Institute. (2011b). *Access evidence*. Retrieved from http://www.joannabriggs.edu.au/Access%20Evidence

The Joanna Briggs Institute. (2011c). *Welcome to JBI COnNECT+*. Retrieved from http://connect.jbiconnectplus.org/

Ketterman, E., & Besaw, M. E. (2010). An evaluation of citation counts, search results, and frequency of updates in DynaMed and UpToDate. *Journal of Electronic Resources in Medical Libraries*, *7*(4), 273–280.

Kronenfeld, M., Stephenson, P. L., Nail-Chiwetalu, B., ... Ratner, N. B. (2007). Review for librarians of evidence-based practice in nursing and the allied health professions in the United States. *Journal of the Medical Library Association*, *95*(4), 394–407.

Natural Standard. (2011). *Natural Standard: The authority on integrative medicine*. Retrieved from http://naturalstandard.com/index.asp

Perry, G. J., & Kronenfeld, M. R. (2005). Evidence-based practice: A new paradigm brings new opportunities for health sciences librarians. *Medical Reference Services Quarterly*, *24*(4), 1–16.

ProQuest. (2011). *ProQuest Nursing & Allied Health Source*. Retrieved from http://www.proquest.com/en-US/catalogs/databases/detail/pq_nursingahs.shtml

Reitz, J. M. (2007). *ODLIS—Online Dictionary for Library and Information Science*. Retrieved from http://lu.com/odlis/

Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence-based medicine: What it is and what it isn't. *BMJ*, *312*(7023),71–72. Retrieved from http://www.bmj.com/content/312/7023/71.full

Sackett, D. L., Straus, S. E., Richardson, W. S., Rosenberg W., & Haynes R. B. (2000). *Evidence-based medicine: How to practice and teach EBM* (2nd ed.). Edinburgh, Scotland: Churchill Livingstone.

Schardt, C., Adams, M. B., Owens, T., Keitz, S., & Fontelo, P. (2007). Utilization of the PICO framework to improve searching PubMed for clinical questions. *BMC Medical Informatics and Decision Making*, *7*,16. Retrieved from http://www.biomedcentral.com/1472-6947/7/16

Scott, K., & McSherry, R. (2008). Evidence-based nursing: Clarifying the concepts for nurses in practice. *Journal of Clinical Nursing*, *18*(8), 1085–1095.

SUNY Downstate Medical Center. (2004a). *SUNY Downstate EBM tutorial: Case control studies*. Retrieved from http://library.downstate.edu/EBM2/2500.htm

SUNY Downstate Medical Center. (2004b). *SUNY Downstate EBM tutorial: Cohort studies*. Retrieved from http://library.downstate.edu/EBM2/2400.htm

TRIP Database. (2011). *About TRIP*. Retrieved from http://www.tripdatabase.com/about

Trustees of Dartmouth College and Yale University. (2006). *Supporting clinical care: An institute in evidence-based practice for medical librarians*. Retrieved from http://www.dartmouth.edu/~biomed/institute2010/pyramid.html

U.S. National Library of Medicine. (2011a). *Fact sheet: Medical subject headings (MeSH)*. Retrieved from http://www.nlm.nih.gov/pubs/factsheets/mesh.html

U.S. National Library of Medicine. (2011b). *Fact sheet: Online indexing system*. Retrieved from http://www.nlm.nih.gov/pubs/factsheets/online_indexing_system.html

U.S. National Library of Medicine. (2011c). *Frequently asked questions about indexing for MEDLINE*. Retrieved from http://www.nlm.nih.gov/bsd/indexfaq.html

U.S. National Library of Medicine. (2011d). *PubMed home*. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed

U.S. National Library of Medicine. (2011e). *Young adult (MeSH result)*. Retrieved from http://www.ncbi.nlm.nih.gov/mesh/68055815

UpToDate, Inc. (2011a). *About UpToDate*. Retrieved from http://www.uptodate.com/home/about/index.html

UpToDate, Inc. (2011b). *UpToDate mobile access*. Retrieved from http://www.uptodate.com/home/about/mobile-access.html

Walker, G., & James, J. (1993). *Online retrieval: A dialogue of theory and practice* (2nd ed.). Englewood, CO: Libraries Unlimited.

The Evidence for Providing the Midwifery Workforce

2

Barbara A. Anderson and Rebeca Barroso

MATERNAL HEALTH IN THE UNITED STATES

The health of mothers in the United States is a rising concern. Although maternal mortality has been decreasing globally (Hogan et al., 2010), the secular trend in maternal mortality in the United States has been stagnant over the past 40 years and is now rising (Lang & King, 2008). The U.S. maternal mortality ratio (MMR) has dropped to 40th in the world, among the highest of developed nations (WHO, UNICEF, UNFPA, & World Bank, 2005). Half of the maternal mortality in the United States is preventable (Bacak, Berg, Desmarais, Hutchins, & Locke, 2006). A considerable number of U.S. women are not in these statistics because they are barely saved from pregnancy-related death.

Maternal morbidity is increasing, raising concern about these "near misses," the increasing number of woman barely saved (Danel, Berg, Johnson, & Atrash, 2003; Lang & King, 2008). In its 2010 landmark report, *Deadly Delivery: The Maternal Health Care Crisis in the USA*, Amnesty International USA (AIUSA) cites a 25% rise in "near misses" since 1998, with one third (1.7 million) of all childbearing American women each year experiencing pregnancy-related complications. Two to three maternal deaths occur each day in the United States (see Table 34 of Heron et al., 2009 for complete details), and death from pregnancy-related complications is four times higher among African American women than White women (AIUSA, 2010; Main, 2010). This disparity remains comparable to figures dating back to 1982 (Johnson & Rutledge, 1998). Yet, the United States expends more money on health care services than any other nation, with a large proportion ($86 million) spent on pregnancy- and childbirth-related hospital costs (Andrews, 2008).

Comparison With Global Maternal Mortality

Although extremely high, the global MMR (the number of maternal deaths compared to 100,000 live births) has shown an overall decrease. The United Nations

Millennium Development Goal (MDG) number 5, "Improve Maternal Health," aims for a global reduction of 75% in MMR by 2015 (United Nations Development Programme, 2006). Globally, there have been an estimated 526,300 maternal deaths per year since 1980 and that number has now dropped to 342,900 deaths per year, as measured in 2008 among 181 member nations of the United Nations. Fifty percent of maternal deaths in 2008 occurred in six countries (India, Nigeria, Pakistan, Afghanistan, Ethiopia, and the Democratic Republic of the Congo), pointing toward significant improvement in other nations (Hogan et al., 2010). Twenty-three nations are on track to meet MDG number 5, whereas four countries are ahead of the curve (Egypt, China, Ecuador, and Bolivia; Hogan et al., 2010). The four countries ahead of projections are low-resource countries, with major economic and logistical barriers to providing maternal health (first author, Anderson, personal working experience in these four nations).

According to Hogan et al. (2010), the MMR in the United States has increased from 12/100,000 to 17/100,000. This figure is a mean that does not reflect the wide ranges in U.S. MMR based on health disparities. In comparison, neighboring Canada, with a large Native American population, has remained steady during this period, with an MMR of 7/100,000, and Mexico has seen improvement from 124/100,000 in 1980 to 52/100,000 in 2009 (Hogan et al., 2010). The Centers for Disease Control and Prevention (CDC) publishes a different figure for MMR in the United States (12.7/100,000 live births in 2007), using this figure as the benchmark for the *Healthy People 2020* objective of 10% improvement to an MMR of 11.4/100,000 live births by 2020 (CDC, 2011a).

Some of the data disparity in U.S. maternal mortality figures can be attributed to recent enhanced statistical data collection. The 1999 revision in the coding of maternal deaths in the *International Classification of Diseases, Tenth Revision* (*ICD-10*) was expanded to include late maternal deaths, generally not included in U.S. statistics prior to this revision (Hoyert, 2007). In the United States, there currently has no federal requirement to report pregnancy-related deaths. Only six states have mandated reporting of maternal deaths, and maternal mortality review boards exist in a limited number of states. Although enhanced statistical data collection techniques since 1999 account for a limited portion of the difference, there is consensus among leaders in the field that the rise in MMR is more than a data artifact and that, in fact, MMR is underreported (AIUSA, 2010; Bacak et al., 2006). The Healthy People 2010 objective for a MMR less than 4/100,000 has not been achieved except among White women in three states: Maine, Nebraska, and Washington (AIUSA, 2010).

Largely, the U.S. population remains unaware of the huge differences in MMR among subpopulations in the United States and that MMR is significantly better in other developed nations and some developing nations. This lack of awareness is reflected in the media. The *Los Angeles Times*, a major national newspaper, recently ran an article entitled "Maternal Death Rate Soars in South Africa," citing MMR statistics of 12 African nations compared to the United States (quoted as being 24/100,00; Dixon, 2011). The article depicts horrible conditions for mothers in Africa while ignoring the fact that the quoted 24/100,000 MMR represents an extremely high MMR for a developed nation.

Maternal Morbidity in the United States

Healthy People 2020 targets reduction in maternal morbidity as well as mortality. The objective addressing morbidity targets a 10% improvement in reducing maternal illness and complications due to pregnancy during hospitalized labor and birth (CDC, 2011b). Some maternal morbidity issues, such as hypertension or substance abuse, that complicate the intrapartum period are often grounded in underlying, preexisting conditions. Examples include obesity, depression, substance abuse, and intimate partner violence (CDC, 2010; Danel et al., 2003; Reece, 2008; Siega-Riz & Laraia, 2006). These conditions are rooted in the social determinants of illness and reflect the health of the general population. In addition to prevalent pregnancy-linked morbidities (e.g., hemorrhage, eclampsia, thromboembolic events), there is growing concern about cardiac myopathy (Lang & King, 2008) and the high rates of short-term or failed breastfeeding as a factor in protecting women from certain cancers later in life (Engstrom & Meier, 2012; Ip et al., 2007; U.S. Department of Health and Human Services, 2000).

Social Determinants of Maternal Mortality and Morbidity

Maternal mortality and morbidity disproportionally affect vulnerable populations of women, such as those living in poverty, facing racial and ethnic discrimination, and having limited English language skills. From a public health perspective, infant mortality is considered the measuring stick for determining the health of the population, whereas maternal mortality is the divider between wealth and poverty. Maternal mortality disproportionally affects poor women in the United States.

Native American and African American women are among those with the highest rates of mortality and morbidity (Bryant, Worjoloh, Caughey, & Washington, 2010; MacDorman & Mathews, 2011; Tucker, Berg, Callaghan, & Hsia, 2007). Although minorities represent 32% of the population, 51% of minorities are medically uninsured or underinsured, contributing to difficulty in obtaining health care services. Some 13 million American women of reproductive age, 1 of every 5, have no health insurance (AIUSA, 2010). Even with health insurance, access to care is limited for many women, especially those living in rural areas, with 25% of vulnerable women unable to receive timely prenatal care (up to 33% among Native Americans and African Americans). Government-sponsored Medicaid benefits are often delayed until the woman is into the second or third trimester of her pregnancy (AIUSA, 2010). In addition, if a woman has a high-risk pregnancy, her risk of mortality is 5.3 times greater if she does not receive adequate and timely prenatal care (Rosenberg, Geller, Studee, & Cox, 2006).

An interesting exception to the poor outcomes among marginalized women is the "first-generation effect" seen among varying ethnicities of women who experience pregnancy as newly arrived, first-generation immigrants to the United States, and tend to have good birth outcomes (Gagnon, Zimbeck, & Zeitlin, 2009). In working with first-generation pregnant immigrants from Cambodia, Central America, and Mexico, the first author has noted the excellent birth outcomes and high rate of breastfeeding.

Although there are many social determinants of poor outcomes, access to care is a critical factor exacerbated by the current and growing health care provider

shortage in the United States. The midwifery model of care, as a safe and proven approach, has been endorsed as a part of the solution to access to care in key policy documents (CDC 2011a; Institute of Medicine [IOM], 2010). "Studies both in the USA and in other countries have documented the safety, benefits and positive outcomes for mothers and infants of a midwifery model of care" (AIUSA, 2010, p. 80). Yet, the United States has a significant deficit in the number of nurse-midwives. The focus of this chapter is on the factors driving this shortage and the evidence for providing the nurse-midwifery workforce as a key factor in improving maternal health in the United States.

THE MIDWIFERY WORKFORCE: THE EVIDENCE

The Workforce Shortage

The World Health Organization (WHO) MDGs target the critical health provider workforce shortage as a key factor in global health (WHO, 2005; WHO, 2006c). Two million (50%) of the estimated shortage of health care providers are nurses (WHO, 2006c). This shortage, most acutely felt in developing countries (WHO, 2006c), is further impacted by aggressive recruitment of nurses to affluent regions of the world. This highly politicized issue has profound effects on the delivery of primary health care services and public health programs in poor nations (Anderson & Isaacs, 2007; Chaguturu & Vallabhaneni, 2005; Garrett, 2007; International Council of Nurses, 2006; Mensah, Mackintosh, & Henry, 2005; Oulton, 2006; "Poaching Nurses," 2006; Proto & Dzurec, 2009; Ross, Polsky, & Sochalski, 2005; Spacracio, 2005). The WHO is striving with difficulty to stabilize the nursing workforce through strategies and road maps for capacity building (WHO, 2006b).

In the United States, multiple factors affect the growing demand for nurses, including the high acuity of illness, an aging population, and the attrition of the aging nursing workforce (Aiken, 2007; Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Buerhaus et al., 2007; IOM, 2001; IOM & Robert Wood Johnson Foundation, 2010; The Joint Commission [TJC], 2008). With 126,000 nursing positions currently vacant, inadequate numbers of students undergoing preparation for the profession, and an estimated deficit of 1 million nurses by 2020, the availability of nurses, including advanced practice nurses, such as nurse-midwives, is a front-line issue (Anderson & Camacho Carr, 2011; Buchan, 2006; Buerhaus, Staiger, & Auerbach, 2008; Chaguturu & Vallabhaneni, 2005; Kuehn, 2007; Raines, 2008). Hinshaw (2008) describes the situation as a "perfect storm" (p. 4).

The inadequate nursing workforce in the United States is symptomatic of deep issues in the health care system. One issue is the critical shortage of nursing faculty (Aiken, 2007; Allen, 2008; TJC, 2008). Failure to resolve this shortage directly contributes to problems in preparing adequate numbers of nurses and advanced practice nurses, thus limiting the number of certified nurse-midwives (CNMs) who can provide nurse-midwifery care for American women. At present, only a minority of women of childbearing age have access to nurse-midwife care in the United States (Declerq, 2011).

Building and Maintaining the Midwifery Workforce

Maintaining an adequate pipeline of nurses is essential to increasing the numbers of nurse-midwives in clinical practice. An expanded nurse-midwife workforce is essential to adequately serve the women and infants in need of primary health care and childbearing services in the United States (American College of Nurse-Midwives [ACNM], 2009; Breckinridge, 1952; Davis-Floyd & Johnson, 2006; Fullerton, Schuiling, & Sipe, 2005; Rooks, Ernst, Norsigian, & Guran, 2008). Two priorities of ACNM are

1. providing nurse-midwifery attended births for 20% of vaginal births in the United States by 2015 and
2. graduating and certifying 1000 new nurse-midwives every year by 2015 (ACNM, 2009).

In the landmark 2010 document on maternal health in the United States, the AIUSA discusses the critical shortage of nurse midwives in the provision of care for women with normal pregnancies. The document states,

> A central component of the right to health is the availability of sufficient health facilities and trained professionals. However, in the USA the shortage of health care professionals is a serious obstacle to timely and adequate health care for some women, particularly in rural areas and the inner cities. The USA has . . . the lowest proportion of midwives to birth (0.4 per 1000 births) of any of the industrialized countries reporting these figures. (p. 62)

"Making more nurse-midwives" (E. K. Ernst, personal communication, May 27, 2010) is one solution to overcoming this deficit and to providing the midwifery model of care for women in the United States.

Another key workforce issue is addressing low job satisfaction, attrition, and burnout (Christmas, 2008; Clark, 2010; *Employee and Nurse Check-up Report*, 2008; Hinshaw, 2008; Oulton, 2006; TJC, 2008). Preventing burnout and retaining practicing nurse-midwives is essential. However, multiple barriers to practice limit the expansion of the nurse-midwifery clinical workforce (Davis-Floyd & Johnson, 2006; Declerq, 2011; Goodman, 2007). One barrier is the prevalence of a hostile practice climate that can lead to burnout. *Burnout* is defined as a state of "emotional exhaustion, depersonalization and reduced level of personal accomplishments caused by long-term involvement in situations that are emotionally demanding" (Gustaffson, Eriksson, Strandberg, & Norberg, 2010, p. 23).

Burnout affects professionals in all clinical specialties (Maslach, Jackson, & Leiter, 1997; Schaufeli, Leiter, & Maslach, 2009). It negatively affects the quality of patient care and the quantity of clinical practitioners available. Known components of clinician burnout are compassion fatigue, job fatigue, and job dissatisfaction manifested as exhaustion, cynicism, and inefficacy (Adams, Boscarino, & Figley, 2006; Beaver, Sharp, & Cotsonis, 1986; Landon, Reschovsky, Hoangmai, & Blumenthal, 2006; Maslach & Leiter, 2005; Schaufeli & Buunk, 2003). Clinicians exhibiting these symptoms are likely to provide less than optimal care (Vahey, Aiken, Sloane, Clarke, & Vargas, 2004; Wee & Myers, 2003).

Clinicians suffering from burnout are poor role models for the profession, impacting the perceptions of patients, other clinicians, and students as new members to the profession (Abendroth & Flannery, 2006; Ben-Zur & Michael, 2007; Dyrbye et al., 2010). Eventual consequences of burnout include intent to withdraw from clinical practice, workplace turnover, and attrition resulting in cumulative instability and potential lack of growth in the profession (Crow & Hartman, 2005; Kim & Stoner, 2008; MacKusick & Minick, 2010; Masselink, Lee, & Konrad, 2008). In contrast, clinicians who are engaged and resilient provide beneficial service and model the profession's highest aspirations (Larrabee et al., 2010; Leiter & Maslach, 2010; Maslach, Schaufeli, & Leiter, 2001; Stewart, McNulty, Griffin, & Fitzpatrick, 2010).

Beaver et al. (1986) examined burnout among practicing nurse-midwives in the United States. However, there are no recent publications on intent to withdraw from clinical practice, workplace turnover, or clinical attrition among nurse-midwives. Personal communications with three national leaders in nurse-midwifery (K. Osborne, May 27, 2010; E. K. Ernst, May 28, 2010; E. S. Sharp, July 24, 2010) indicate that burnout continues to adversely affect the profession both quantitatively and qualitatively. It is a pervasive factor undermining efforts to build, maintain, and strengthen the nurse-midwifery workforce.

BEST PRACTICES FOR ENSURING THE MIDWIFERY WORKFORCE

Key national documents on reform of the U.S. health care delivery system provide strong support for nurse-midwifery as an essential strategy to building and stabilizing the health care system (CDC, 2011a, 2011b; IOM, 2010). The Transforming Maternity Care Symposium, held in Washington, DC in 2009, convened clinical experts, policy makers, program administrators, and advocates for maternal health to develop a national plan on reforming maternity care practices. A key component of this plan was support for the normalcy of birth, for the midwifery model of care, and for increasing the nurse-midwifery workforce in the United States (Transforming Maternity Care Symposium Steering Committee, 2010).

The U.S. approach to maternity care is not normative across the world. Across the globe, the midwifery model of care is considered the standard. Midwifery is a recognized, mainstream health care profession and an essential and primary care profession in the provision of maternal and newborn health services (Hatem, Sandall, Devane, Soltani, & Gates, 2009; WHO, 2006b).

Make More Midwives: Nurse-Midwifery Education

Improving nurse-midwifery education begins with improving the pipeline at the basic nursing education level. The issues of insufficient graduates and the faculty shortage are discussed earlier and are not the focus of this chapter. However, the story begins long before the beginning nursing student starts education. In order to build an adequate workforce of nurses and, subsequently, the nurses who will become the nurse-midwives serving the nation, it is essential for youth to be exposed to messages about career opportunities in nursing (Gormley, Frerick, &

Dean, 2009). Nurse-midwifery is very appealing to many youth once they have been exposed to the paradigm.

A best practice for educating beginning nursing students is to provide a positive exposure to childbearing and the role of the health care system in supporting normal birth. Unfortunately, basic nursing education prepares student nurses poorly in understanding normal birth or in the value of birth setting options for women. The opportunity for rotation in a birth center is an exceptional rather than a normative experience. The average nursing student is exposed only to highly technological hospital birth, even for the healthiest, most normal woman having a baby. Improving midwifery education begins at the basic nursing education level with a more balanced approach to childbearing, including exposure to normal, healthy women birthing in hospitals, birth centers, and homes. The nursing students need to work with the cadre of health professionals qualified to attend a childbearing woman, most especially nurse-midwives who can offer examples of the midwifery model of care. Such exposure provides nursing students with the opportunity to consider nurse-midwifery as a career option.

At the level of nurse-midwifery education, it is critical to expand clinical sites and availability of preceptors. The pace of care is often such that practicing nurse-midwives are reluctant to preceptor student nurse-midwives; yet, one of the greatest services and legacies of a nurse-midwife is to pass on the knowledge, attitudes, and skills inherent in the midwifery model of care. As best practice, nurse-midwifery programs need to place priority on obtaining and maintaining relationships at clinical sites and encouraging preceptors. There are a number of ways to reward preceptors including stipends (if possible), recognition, tuition reimbursement for courses, and adjunct faculty appointments.

A critical juncture in career development and satisfaction occurs when a newly graduated and credentialed nurse-midwife enters the profession. This is the point when the beginning midwife needs role and skill mentoring. Nurse-midwife residency programs and one-to-one mentoring with an expert nurse-midwife are best practices to enhance the early development of the novice nurse-midwife and ensure sufficient numbers of nurse-midwives continuing in the workforce.

Prioritizing doctoral preparation of advanced practice nurses, including nurse-midwives, is a best practice that has significant potential for optimizing health outcomes in the nation (American Association of Colleges of Nursing, 2010; IOM, 2010). Doctoral-level nurse-midwives bring leadership skills to the negotiating table, to nurse-midwifery education, and to the solution of complex clinical problems. Having clinically expert and articulate faculty is a hallmark of excellence in nurse-midwifery education.

Organizational Support for Professional Development

Another best practice for ensuring the nurse-midwifery workforce is organizational support for continuing education and discussion forums on the many issues facing the profession, such as practice management, relations with other professions caring for women and infants, or advocacy for targeted issues impacting practice.

Attending the annual ACNM national meeting and offerings of the regional affiliates are ways to support this best practice.

Support for Advocacy in Workforce Development

The landmark document, *The Future of Nursing: Leading Change, Advancing Health,* released by the Institute of Medicine and the Robert Wood Johnson Foundation, (2010) is a strong policy approach to addressing the workforce shortage. This document advances the following action agenda:

1. Full utilization of the training and education of nurses,
2. Support for higher levels of education in a seamless progression from the bachelor's level to the doctoral level,
3. Full partnership with physicians and other health care professionals in health care reform and redesign, and
4. Improved nursing workforce policy and planning.

The document recommends doubling the number of doctoral-prepared nurses by 2020 (IOM, 2010). Investment in nursing leadership and workforce development has been acknowledged as catalytic to reforming the health care system. Capacity building for an adequate nurse-midwifery workforce is a best practice in promoting the health of the nation, especially for rural, underserved communities with young families (Cramer, Duncan, Megel, & Pitkin, 2009; Ganley & Sheets, 2009). Making more nurse-midwives and keeping them in the workforce are key strategies in meeting the goals of *Healthy People 2020*.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 2.1

Overcoming Burnout and Building the Business of Midwifery

Susan, age 52, is a nurse-midwife who has been working in full scope practice for 15 years: "I'm tired of being invisible . . . all the responsibility and no power!" After working for 2 years at a large university-based practice, she started a community hospital nurse-midwife practice as part of the obstetrical service. Thirteen years later, Susan says that she is "totally spent with nothing left to give." The three nurse-midwives and the physicians in the practice have no serious conflicts in practice philosophy or workplace dynamics, but both services have been chronically understaffed. The nurse-midwife service covers clinics, 24/7 call for nurse-midwifery patients, day call for physician patients, and first-assist in cesarean sections. The nurse-midwives are also responsible for all after-hours calls, triage, and postpartum rounds.

(continued)

CASE STUDY *(continued)*

The nurse-midwife service has the best rates in the region for vaginal births and vaginal births after cesarean (VBACs). The service attends about 60 births per month. Over the past 8 years, the service has attended 62% of vaginal births and has been involved in 71% of all the births at the hospital, averaging 80–100 weekly work hours per nurse-midwife. Susan says, "The women and their families are lovely. . . . Salaries are well above the median but no longer begin to compensate for the constant stress and exhaustion."

Although the nurse-midwives attend most of the births, Susan still has to explain "what nurse-midwives do" to other departments at least once a month and every time a new administrator joins the institution. Due to mergers, it has become more difficult to account for nurse-midwife work productivity. The accounting system places admissions under the consulting physicians' names to "simplify" tracking and credits the director with all admissions and births, thus providing him with the only year-end bonus. Susan tracked nurse-midwife–generated revenue to refute the decision to cut nurse-midwife staffing due to "insufficient productivity" but was ignored.

Exemplar of Best Practice

Eight months later, with no changes in administrative stance, Susan and two nurse-midwife colleagues opened a private practice with the same obstetrician consultants and privileges to births at the same hospital. Susan took several coding and billing workshops. Mentor relationships were arranged through the business section of the American College of Nurse-Midwives and the Midwifery Business Network. Susan and the other nurse-midwife, Teresa, have set up a partnership, whereas the third nurse-midwife, Angela, chose to be an employee. The team has set up practice parameters, and the workload is evenly divided. The physicians agreed to be consultants and the nurse-midwives no longer cover call for the physicians. They bill directly for services on all first-assist work. Susan calculated that if 50% of the current nurse-midwifery clientele come to their service, the revenue will cover practice costs. The larger nurse-midwife community expressed support.

Salaries are average and benefits are adequate but less than at the hospital. Once the loan is paid off, Susan and Teresa expect to earn year-end bonuses and provide a pay raise for Angela. Susan says she has overcome burnout: "We will work hard and serve the women with the best services we can provide. We will be doing this work on our terms and that feels like a much lighter load."

REFERENCES

Abendroth, M., & Flannery, J. (2006). Predicting the risk of compassion fatigue: A study of hospice nurses. *Journal of Hospice and Palliative Nursing*, *8*(6), 346–356.

Adams, R. E., Boscarino, J. A., & Figley, C. R. (2006). Compassion fatigue and psychological distress among social workers: A validation study. *The American Journal of Orthopsychiatry*, *76*(1), 103–108.

Aiken, L. H. (2007). U.S. nurse labor market dynamics are key to global nurse sufficiency. *Health Services Research*, *42*(3 Pt. 2), 1299–1320.

Aiken, L. H., Clarke, S. P., Cheung, R. B., Sloane, D. M., & Silber, J. H. (2003). Educational levels of hospital nurses and surgical patient mortality. *Journal of the American Medical Association*, *290*(12), 1617–1623.

Allen, L. (2008). The nursing shortage continues as faculty shortage grows. *Nursing Economic$*, *26*(1), 35–40.

American Association of Colleges of Nursing. (2010). *Joint statement from the Tri-Council for Nursing on recent registered nurse supply and demand projections*. Retrieved from http://www.aacn.nche.edu/Education/pdf/Tricouncilrnsupply.pdf

American College of Nurse-Midwives. (2009). *ACNM future focus: Moving forward strategically to meet our long-term goals*. Retrieved from http://www.midwife.org/ACNM-Future-Focus

Amnesty International USA. (2010). *Deadly delivery: The maternal health care crisis in the USA*. London, United Kingdom: Amnesty International Secretariat Peter Benenson House.

Anderson, B. A., & Camacho Carr, K. (2011). The global nursing shortage: An issue of social justice. In P. Cowen & S. Moorhead (Eds.), *Current Issues in Nursing* (8th ed., pp. 766–775). St Louis, MO: Mosby Elsevier.

Anderson, B. A., & Isaacs, A. A. (2007). Simply not there: The impact of international migration of nurses and midwives—Perspectives from Guyana. *Journal of Midwifery & Women's Health*, *52*(4), 392–397.

Andrews, R. (2008). *The national hospital bill: The most expensive conditions by payer, 2006* (AHRQ, Healthcare Cost and Utilization Project, Statistical Brief No.59). Retrieved from http://www.hcup-us.ahrq.gov/reports/statbriefs/sb59.pdf

Bacak, S., Berg, C., Desmarais, J., Hutchins, E., & Locke, E. (Eds). (2006). *State maternal mortality review—accomplishments of nine states*. Atlanta, GA: Centers for Disease Control and Prevention.

Beaver, R. C., Sharp, E. S., & Cotsonis, G. A. (1986). Burnout experienced by nurse-midwives. *Journal of Nurse-Midwifery*, *31*(1), 3–15.

Ben-Zur, H., & Michael, K. (2007). Burnout, social support, and coping at work among social workers, psychologists, and nurses: The role of challenge/control appraisals. *Social Work in Health Care*, *45*(4), 63–82.

Breckinridge, M. (1952). *Wide neighborhoods: A story of the frontier nursing service*. Lexington, KY: The University Press of Kentucky.

Bryant, A. S., Worjoloh, A., Caughey, A. B., & Washington, A. E. (2010). Racial/ethnic disparities in obstetric outcomes and care: Prevalence and determinants. *American Journal of Obstetrics and Gynecology*, *202*(4), 335–343.

Buchan, J. (2006). The impact of global nursing migration on health services delivery. *Policy, Politics, & Nursing Practice*, *7*(Suppl. 3), 16S–25S.

Buerhaus, P. I., Donelan, K., Ulrich, B. T., Norman, L., DesRoches, C., & Dittus, R. (2007). Impact of the nurse shortage on hospital patient care: Comparative perspectives. *Health Affairs*, *26*(3), 853–862.

Buerhaus, P. I., Staiger, D., & Auerbach, D. (2008). *The future of the nursing workforce in the United States: Data, trends and implications*. Boston, MA: Jones and Bartlett.

Centers for Disease Control and Prevention. (2010). *Maternal and infant health research: Pregnancy complications*. Retrieved from http://www.cdc.gov/reproductivehealth/maternalinfanthealth/PregComplications.htm

Centers for Disease Control and Prevention. (2011a). *Healthy People 2020, topics and objectives—maternal, infant, and child health: MICH-5*. Retrieved from http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=26

Centers for Disease Control and Prevention. (2011b). *Healthy People 2020, topics and objectives—maternal, infant, and child health: MICH-6*. Retrieved from http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=26

Chaguturu, S., & Vallabhaneni, B. A. (2005). Aiding and abetting—Nursing crises at home and abroad. *New England Journal of Medicine*, *353*(17), 1761–1763.

Christmas, K. (2008). How work environment impacts retention. *Nursing Economic$*, *26*(5), 316–318.

Clark, C. (2010). The nursing shortage as a community transformational opportunity: An update. *Advances in Nursing Science*, *33*(1), 35–52.

Cramer, M., Duncan, K., Megel, M., & Pitkin, S. (2009). Partnering with rural communities to meet the demand for a qualified nursing workforce. *Nursing Outlook*, *57*(3), 148–157.

Crow, S. M., & Hartman, S. J. (2005). Nurse attrition as a process. *The Health Care Manager*, *24*(3), 276–283.

Danel, I., Berg, C., Johnson, C. H., & Atrash, H. (2003). Magnitude of maternal morbidity during labor and delivery: United States, 1993–1997. *American Journal of Public Health*, *93*(4), 631–634.

Davis-Floyd, R., & Johnson, C. B. (Eds.). (2006). *Mainstreaming midwives: The politics of change*. New York, NY: Rutledge Press.

Declerq, E. (2011). Trend in midwife-attended births, 1989 to 2007. *Journal of Midwifery & Women's Health*, *56*(2), 173–176.

Dixon, R. (2011, September 16). Maternal death rate soars in South Africa. *Los Angeles Times*, p. A6.

Dyrbye, L. N., Massie, F. S., Eacker, A., Harper, W., Power, D., Durning, S. J., . . . Shanafelt, T. D. (2010). Relationship between burnout and professional conduct and attitudes among US medical students. *Journal of the American Medical Association*, *304*(11), 1173–1180.

Employee and nurse check-up report: Employee and nurse perspectives on American health care organizations. (2008). South Bend, IN: Press Ganey Associates.

Engstrom, J., & Meier, P. (2012). Using self-efficacy theory to help vulnerable women breastfeed. In M. de Chesnay & B. Anderson (Eds.), *Caring for the vulnerable: Perspectives in nursing theory, practice and research* (3rd ed., pp. 169–181). Burlington, MA: Jones & Bartlett Learning.

Fullerton, J., Schuiling, K. D., & Sipe, T. A. (2005). Presidential priorities: 50 years of wisdom as the basis of an action agenda for the next half-century. *Journal of Midwifery & Women's Health*, *50*(2), 91–101.

Gagnon, A., Zimbeck, M., & Zeitlin, J. (2009). Migration to western industrialized countries and perinatal health: A systematic review. *Social Science & Medicine*, *69*(6), 934–946.

Ganley, B. J., & Sheets, I. (2009). A strategy to address the nursing shortage. *Journal of Nursing Education*, *48*(7), 401–405.

Garrett, L. (2007). *The challenge of global health*. Retrieved from http://www.foreignaffairs.com/articles/62268/laurie-garrett/the-challenge-of-global-health

Goodman, S. (2007). Piercing the veil: The marginalization of midwives in the United States. *Social Sciences & Medicine*, *65*(3), 610–621.

Gormley, D. K., Frerick, J. A., & Dean, A. (2009). Pathways to nursing: An innovative program to encourage high school students to enter nursing. *Kentucky Nurse*, *57*(4), 7–8.

Gustaffson, G., Eriksson, S., Strandberg, G., & Norberg, A. (2010). Burnout and perceptions of conscience among health care personnel: A pilot study. *Nursing Ethics*, *17*(1), 23–38.

Hatem, M., Sandall, J., Devane, D., Soltani, H., & Gates, S. (2009). Midwife-led versus other models of care for childbearing women. *Cochrane Database of Systematic Reviews*, (4), 1–22. doi:10:1002/14651858.CD004667.pub2

Heron, M., Hoyert, D. L., Murphy, S. L., Xu, J., Kochanek, K., & Tejada-Vera, B. (2009). Deaths: Final data for 2006. *National Vital Statistics Reports*, *57*(14), 1–134.

Hinshaw, A. S. (2008). Navigating the perfect storm: Balancing a culture of safety with workforce challenges. *Nursing Research*, *57*(Suppl. 1), S4–S10.

Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang, M., Makela, S. M., . . . Murray, C. J. (2010). Maternal mortality for 181 countries, 1980–2008: A systematic analysis of progress towards Millennium Development Goal 5. *The Lancet*, *375* (9726), 1609–1623. doi:10.1016/S0140-6736 (10) 60518-1

Hoyert, D. L. (2007). Maternal mortality and related concepts. *National Center for Health Statistics Vital Health Statistics*, (3), 1–13.

Institute of Medicine. (2001). *To err is human: Building a safer health system*. Washington, DC: The National Academy Press.

Institute of Medicine and the Robert Wood Johnson Foundation. (2010). *The future of nursing: Leading change, advancing health*. Washington, DC: The National Academy Press.

International Council of Nurses. (2006). *The global nursing shortage: Priority areas for intervention*. Geneva, Switzerland: Author.

Ip, S., Chung, M., Raman, G., Chew, P., Magula, N., DeVine, D., . . . Lau, J. (2007). *Breastfeeding and maternal and infant health outcomes in developed countries* (AHRQ Publication No. 07-E007). Rockville, MD: Government Printing Office.

Johnson, D., & Rutledge, R. (1998). Maternal mortality—United States, 1982–1996. *Morbidity and Mortality Weekly Report, Centers for Disease Control and Prevention*, *47*(34), 705–707.

The Joint Commission. (2008). *Health care at the crossroads: Guiding principles for the development of the hospital of the future*. Retrieved from http://www.jointcommission.org/assets/1/18/Hosptal_Future.pdf

Kim, H., & Stoner, M. (2008). Burnout and turnover intention among social workers: Effects of role stress, job autonomy, and social support. *Administration in Social Work*, *32*(3), 5–25.

Kuehn, B. (2007). No end in sight to nursing shortage: Bottleneck at nursing schools is key factor. *Journal of the American Medical Association*, *298*(14), 1623–1625.

Landon, B. E., Reschovsky, J. D., Hoangmai, H. P., & Blumenthal, D. (2006). Leaving medicine: The consequences of physician dissatisfaction. *Medical Care*, *44*(3), 234–242.

Lang, C., & King, J. (2008). Maternal mortality in the United States: Best practice & research. *Clinical Obstetrics and Gynaecology*, *22*(3), 517–531.

Larrabee, J. H., Wu, Y., Persily, C. A., Simoni, P. S., Johnson, P. A., Marcischak, T. L., . . . Gladden, S. D. (2010). Influence of stress resiliency on RN job satisfaction and intent to stay. *Western Journal of Nursing Research*, *32*(1), 81–102.

Leiter, M. P., & Maslach, C. (2010). Building engagement: The design and evaluation of interventions. In M. P. Leiter & B. Arnold (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 164–180). New York, NY: Psychology Press.

MacDorman, M., & Mathews, T. (2011). *Understanding racial and ethnic disparities in U.S. infant mortality rates* (NCHS Data Brief No.74). Hyattsville, MD: National Center for Health Statistics.

MacKusick, C. I., & Minick, P. (2010). Why are nurses leaving? Findings from an initial qualitative study on nursing attrition. *Medsurg Nursing*, *19*(6), 335–340.

Main, E. (2010). Maternal mortality: New strategies for measurement and prevention. *Current Opinion in Obstetrics & Gynecology*, *22*(6), 511–516.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1997). Maslach Burnout Inventory: Third edition. In C. P. Zalaquett & R. J. Wood (Eds.), *Evaluating stress: A book of resources* (pp. 191–218). Lanham, MD: Scarecrow Press.

Maslach, C., & Leiter, M. P. (2005). Stress and burnout: The critical research. In C. L. Cooper (Ed.), *Handbook of stress medicine and health* (2nd ed., pp. 143–170). London, United Kingdom: CRC Press.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, *52*, 397–422.

Masselink, L. E., Lee, S. Y., & Konrad, T. R. (2008). Workplace relational factors and physicians' intention to withdraw from practice. *Health Care Management Review*, *33*(2), 178–187.

Mensah, K., Mackintosh, M., & Henry, L. (2005). *The "skills drain" of health professionals from the developing world: A framework for policy formulation*. London, United Kingdom: Medact.

Oulton, J. A. (2006). The global nursing shortage: An overview of issues and actions. *Policy, Politics & Nursing Practice*, *7*(Suppl. 3), 34S–39S.

Poaching nurses from the developing world. (2006). *The Lancet*, *367*(9525), 791.

Proto, M. B., & Dzurec, L. C. (2009). Strategies for success management and oversight of nurse faculty workforce initiatives: Lessons from the field. *Journal of Professional Nursing*, *25*(2), 87–92.

Raines, F. (2008). *Seeking collaborative solutions to the nursing shortage*. Washington, DC: Solutions for Our Future, American Council on Education.

Reece, E. (2008). Perspectives on obesity, pregnancy and birth outcomes in the United States: The scope of the problem. *American Journal of Obstetrics and Gynecology*, *198*(1), 23–27.

Rooks, J. P., Ernst, E. K., Norsigian, J., & Guran, L. (2008). Marginalization of midwives in the United States: New responses to an old story. *Birth*, *35*(2), 158–161.

Rosenberg, D., Geller, S. E., Studee, L., & Cox, S. M. (2006). Disparities in mortality among high risk pregnant women in Illinois: A population based study. *Annals of Epidemiology*, *16*(1), 26–32.

Ross, S. J., Polsky, D., & Sochalski, J. (2005). Nursing shortages and international nurse immigration. *International Nursing Review*, *52*(4), 253–262.

Schaufeli, W. B., & Buunk, B. P. (2003). Burnout: An overview of 25 years of research and theorizing. In M. J. Schabracq, J. A. M. Winnubst, & C. L. Cooper (Eds.), *The handbook of work and health psychology* (pp. 383–425). Chichester, United Kingdom: Wiley.

Schaufeli, W. B., Leiter, M. P., & Maslach, C. (2009). Burnout: 35 years of research and practice. *Career Development International*, *14*(3), 204–220.

Siega-Riz, A. M., & Laraia, B. (2006). The implications of maternal overweight and obesity on the course of pregnancy and birth outcomes. *Maternal Child Health Journal*, *10*(Suppl. 1), 153–156.

Spacracio, D. (2005). Winged migration: International nurse recruitment—Friend or foe to the nursing crisis? *Journal of Nursing Law*, *10*(2), 97–114.

Stewart, J. G., McNulty, R., Griffin, M. T., & Fitzpatrick, J. J. (2010). Psychological empowerment and structural empowerment among nurse practitioners. *Journal of the American Academy of Nurse Practitioners*, *22*(1), 27–34.

Transforming Maternity Care Symposium Steering Committee. (2010). Blueprint for action: Steps toward a high quality, high-value maternity care system. *Women's Health Issues*, *20*(Suppl. 1), S18–S49.

Tucker, M. J., Berg, C. J., Callaghan, W. M., & Hsia, J. (2007). The black-white disparity in pregnancy-related mortality from 5 conditions: Differences in prevalence and case fatality rates. *American Journal of Public Health*, *97*(2) 247–251.

United Nations Development Programme. (2006). *About the MDGs: Basics*. Retrieved from http://www.undp.org/mdg/basics.shtml

U.S. Department of Health and Human Services. (2000). *HHS blueprint for action on breastfeeding*. Washington, DC: DHHS Office on Women's Health.

Vahey, D. C., Aiken, L. H., Sloane, D. M., Clarke, S. P., & Vargas, D. (2004). Nurse burnout and patient satisfaction. *Medical Care*, *42*(Suppl. 2), 57–66.

Wee, D., & Myers, D. (2003). Compassion satisfaction, compassion fatigue, and critical incident management. *International Journal of Emergency Mental Health*, *5*(1), 33–37.

WHO, UNICEF, UNFPA, & World Bank. (2005). *Maternal mortality in 2005*. Retrieved from http://www.who.int/whosis/mme_2005.pdf

World Health Organization. (2005). *Health and the millennium development goals: World Health Organization*. Retrieved from http://www.who.int/hdp/publications/mdg_en.pdf

World Health Organization. (2006a). *Global Health Workforce Alliance: List of 57 countries facing human resources for health crisis*. Retrieved from http://www.who.int/workforcealliance/countries/57crisiscountries.pdf

World Health Organization. (2006b). *Why the workforce is important*. Retrieved from http://www.who.int/whr/2006/overview/en/index.html

World Health Organization. (2006c). *Working together for health: The world health report 2006*. Geneva, Switzerland: Author. Retrieved from http://www.who.int/whr/2006/en/

II

Evidence-Based Best Practices in the Care of the Childbearing Woman

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Centering Pregnancy: An Evidence-Based Model of Prenatal Care

3

Deborah Brandt Karsnitz and Margaret Holcomb

HISTORY OF PRENATAL CARE

Modern prenatal care began with the work of Ballantyne, a renowned Scottish physician. In 1902, Ballantyne observed that care for mothers and babies during labor and birth did little to reduce the morbidity and mortality associated with congenital anomalies, multiple births, and fetal diseases (Moos, 2006).

Prenatal Care in the United States

In 1903, Lillian Wald, founder of the Henry Street Settlement and Visiting Nurse Association in New York City (NYC), was instrumental in the development of the Children's Bureau that later conducted an infant mortality study in NYC. The data identified a link between maternal health and infant mortality. A similar study in NYC in 1915 showed comparable findings, concluding that a relationship existed between no prenatal care and increased infant mortality. The findings from various studies on infant mortality in NYC led to the development of prenatal centers and the subsequent establishment of the Maternity Center Association (MCA; Varney, Kriebs, & Gregor, 2004). The MCA's most important project in the early 1900s was a nurse-led program specifically designed to increase access to prenatal care for women in NYC. It was later expanded throughout the United States (Varney et al., 2004).

In 1925, not long after the establishment of the MCA, Mary Breckinridge, founder of the Frontier Nursing Service (FNS), began her lifework to improve access to health care for families and to decrease maternal and infant mortality in rural southeastern Kentucky. Breckinridge believed that if she could demonstrate the effectiveness of nurse-midwifery care provided by British-trained nurse-midwives in a relatively inaccessible geographical region of the United States, this model of care could be replicated anywhere (Breckinridge, 1981). The MCA and

the FNS were pioneer efforts in the establishment of prenatal care that later became successful models of serving women at risk for poor perinatal outcomes.

In the 1920s, U.S. physicians began to assert that they should oversee prenatal care (Moos, 2006). The current model of prenatal care, endorsed by the American College of Obstetricians and Gynecologists (ACOG), is based on Ballantyne's work and has been in place since approximately 1929, with subsequent modifications related to initiating care earlier in the pregnancy and monthly visits until 28 weeks gestational age (Moos, 2006). This model has the first prenatal visit occurring at about 8 weeks' gestation, subsequent monthly visits until 28 weeks, biweekly visits until 36 weeks, and, finally, weekly visits until the time of birth, accounting for 14 individual visits per patient (Moos, 2006). The typical prenatal visit is scheduled for 15 minutes, resulting in about 3.5 minutes of scheduled time with the health care provider.

Greenberg (1983) examined the impact of prenatal care in a cross-sectional survey of all recorded pregnancies in the United States in 1977. He examined pregnancy outcomes among different socioeconomic and ethnic groups. The study used 1977 birth certificate data, comparing women who had "some" prenatal care and those who had "none." Birth weight was one of the evaluated outcome variables. Low-birth weight infants, less than 2500 g, were compared to infants weighing more than 2500 g regardless of gestational age. African American women, both educated and uneducated, were determined to be more likely to give birth to low-birth weight babies (relative risk [RR], 2.70) compared to the general population. Among White women, uneducated White women were more likely to give birth to low-birth weight infants (RR, 2.69) compared to the general population (Greenberg, 1983).

Although this data did support the hypothesis that prenatal care was effective depending on socioeconomic status and ethnicity, it did not examine potential confounding variables such as smoking, maternal age, parity, and history of prior low-birth weight infants. A limitation of the study was using only vital statistics data. Greenberg concluded that it is difficult to determine the effect that prenatal care had on pregnancy outcome.

The Midwifery Model of Prenatal Care

The midwifery model of care has been proposed as the standard of prenatal care. Hatem, Sandall, Devane, Soltani, and Gates (2008) conducted a systematic review in the Cochrane Database of midwife-led versus other models of care for childbearing women. This review concluded that midwife-led care benefits pregnant women and their babies, and that most women should be offered midwife-led models of care, including incorporating Centering Pregnancy. The findings led the authors to state, "The underpinning philosophy of midwife-led care is normality, continuity of care and being cared for by a known and trusted midwife during labour" (p. 2).

The midwifery model of care reflects contemporary thinking in prenatal care and is in line with the 2001 Institute of Medicine (IOM) consensus report, *Crossing the Quality Chasm*, which examined the future of health care in the 21st century. *Crossing the Quality Chasm* identified six aims for health system redesign: timely,

efficient, equitable, safe, effective, and patient centered (IOM, 2002). All of these aims are components of the midwifery model of care.

In a study evaluating satisfaction with midwifery care, Harvey, Rach, Stainton, Jarrell, and Brant (2002) examined the difference in women's satisfaction with maternity care provided by physicians and midwives. They reported greater satisfaction among women receiving midwifery care. A notable flaw is that all patients in the study were exposed to some midwifery care in the clinic, even though patients were randomized to either the physician or the midwife group. The results may be skewed toward midwifery care. These authors concluded that "women experiencing low-risk pregnancies were more satisfied with care by midwives than with care provided by doctors" (p. 260).

CENTERING PREGNANCY—A MIDWIFERY MODEL OF PRENATAL CARE

The Centering Pregnancy Model

Developed in 1993, the Centering Pregnancy model is based on work in Minnesota in the 1970s, when low-income women of similar gestational ages and their partners joined support groups to receive prenatal care from nurse-midwives (Rising, Kennedy, & Klima, 2004). A consumer survey developed by Rising in 1975 indicated a need for more personalized care and control over one's health care. The survey was instrumental in the development of the Childbearing Childrearing Center at the University of Minnesota. This center was composed of a team of nurse-midwives, pediatric nurse practitioners, adult nurse practitioners, and consumer support personnel providing care for women and couples during childbearing and childrearing. The childbearing couples met with the same group from midpregnancy through 4 months postpartum. Both consumers and providers reported satisfaction with the program (Rising, 1998).

Rising (1998) recognized the difficulty in measuring adequacy of prenatal care, referencing the findings of the Public Health Service Expert Panel on the content of prenatal care, described in *Caring for Our Future*. This pivotal document concluded that the content and quality of prenatal care had not been studied sufficiently and challenged the traditions and routines of prenatal care while highlighting the benefits of prenatal education (Rising et al., 2004; U.S. Department of Health and Human Services, 1989).

Rising designed the model for Centering Pregnancy using evidence from the literature and her involvement in the Childbearing Childrearing Center. She presented results from a pilot study of Centering Pregnancy in which 96% of women enrolled in the study preferred prenatal care in groups. The Centering Pregnancy model was further outlined by Rising et al. (2004), incorporating the recommendations of the IOM in *Crossing the Quality Chasm*. Today, the Centering Pregnancy approach to prenatal care is available in all 50 states and in 300 practices (http://www.centeringhealthcare.org).

The Centering Pregnancy model is based on the concept that care is better when the consumer and the provider actively work together using a support group model. Group care is combined with equal partnership (provider and patient on

same level) to create the Centering Pregnancy model. This model places all three components of prenatal care—risk assessment, education, and support—into the group setting. It fosters a sense of empowerment as prenatal group members are encouraged to take responsibility for their own health care (Rising, 1998).

The theoretical bases for the Centering Pregnancy model are feminist theory, the midwifery model of care, and social support theory (Rising et al., 2004). Self-management of one's health is a basic tenet of feminist theory. The midwifery model of care supports the belief that both the nurse-midwife and the woman bring knowledge and power to the relationship. Social support theory speaks to the value of community to one's sense of well-being. Women participating in the Centering Pregnancy model assume ownership of their care by logging weight, blood pressure, and other pertinent data into their own charts. Self-care is encouraged and expected. In addition to maintaining control of their own prenatal records, women complete self-assessment sheets at each visit, promoting patient-directed discussion among the provider, the patient, and the group. Group members are encouraged to seek information about healthy behaviors and common concerns of pregnancy, which builds a partnership between patient and provider (Massey, Rising, & Ickovics, 2006). As women become more confident in their ability to take care of themselves at prenatal visits, they also become more confident in their ability to make health care decisions for themselves (Rising et al., 2004). Also, the model has been noted as building self-confidence and leadership in decision making (Massey et al., 2006).

Centering Pregnancy provides community and social support (Rising et al., 2004). In contrast, the traditional model of prenatal care is authoritarian, in which a patient checks in, waits until her provider is ready to see her, and then is briefly told what she should do to keep herself and her baby healthy. Time for direct discussion and questions is usually limited to only a few minutes of the traditional 15-minute visit (Massey et al., 2006).

Support groups have been found to be an effective intervention for women suffering from depression (Chen, Tseng, Chou, & Wang, 2000). Centering Pregnancy may help to decrease depression among the participants. Women with perinatal depression describe a loss of self (Beck & Indman, 2005), yet they are often reluctant to report signs and symptoms due to the stigma placed on mental health disorders. This stigma is especially prominent among new mothers (Beck, 1999). As they take on new responsibilities with motherhood, women in the United States often combine multiple roles without the aid of family or friends. This lack of assistance at a critical time may contribute to the growing numbers of women suffering from postpartum depression (Locicero, Weiss, & Issokson, 1997). As women become empowered in a supportive environment, depression may be diminished (Rising et al., 2004).

Implementing the Model

Although the concept of Centering Pregnancy is simple—education, support, and risk assessment in a group setting—implementation of the model is challenging. It requires a change in practice and a redesign of the traditional care paradigm.

In the Centering Pregnancy model, women begin prenatal care at approximately 12 weeks' gestation and have 10 visits of 1–2 hours each. "The group model of prenatal care, which expands on the midwifery empowerment model is the most ambitious and revolutionary approach to prenatal care since the work of Ballantyne, a renowned Scottish physician in 1902" (Moos, 2006, p. 283).

Developing a Centering Pregnancy program is a multiphase process requiring careful planning. Recommendations also include starting the planning phase 2 years before the proposed implementation of a program and focusing on the following key principles:

- The patient and provider are at the same hierarchical level;
- The provider must have a facilitative leadership style;
- This model of care is not limited to prenatal education; and
- Groups are conducted in a circle, symbolizing equality.

Moeller, Vezeau, and Camancho Carr (2007) identified a number of challenges to implementation of a Centering Pregnancy program, including philosophy of practice, the need for experienced facilitators, patient confidentiality and reliability in self-care documentation, physical space, and scheduling. In addition, barriers to implementation may include lack of knowledge by providers and patients as well as lack of funding. Provider education regarding Centering Pregnancy and acquisition of funding from outside sources are important steps to initiate and sustain this program.

To normalize the idea of Centering Pregnancy, Colleen Senterfitt, CNM, chief operating officer of the Centering Healthcare Institute, suggests using an "opt out" method for patient enrollment (personal communication, July 8, 2011). Pregnant women are scheduled in groups according to their due dates. If an individual decides she would rather have traditional prenatal care, she must "opt out" of the group care. In implementing Centering Pregnancy, it is essential that pregnant women understand the philosophy and the process. Group care provides considerably more time for education compared to traditional prenatal care (Massey et al., 2006). Most traditional prenatal practices schedule patients every 15 minutes for return visits, allowing little time for anything more than the exam (Moos, 2006; Novick, 2004). The Centering Pregnancy model promotes facilitative leadership for educational sessions.

Each group session includes *mat time*—approximately 3 to 5 minutes per person of individual assessment with a nurse-midwife or other provider, generally behind a screen, and sometimes on a mat. Mat time typically lasts 30 minutes. Providing some privacy but keeping the group together is an important concept of Centering Pregnancy. After the mat time, the remaining time (60–90 minutes) involves facilitated group discussion where women are encouraged to reflect on what they already know (Novick, 2004). Each session has a theme; however, the women lead and control the direction of the discussion, and sharing prior experiences is encouraged (Rising, 1998).

The Centering Pregnancy model encourages social support by keeping a cohort of women of similar gestation together throughout pregnancy and often into the postpartum period (Rising, 1998). Each session includes time for socialization. Respect and privacy are encouraged as women share personal issues and become

familiar with their cohort (Rising et al., 2004). Discussions are held with group members and facilitators sitting in a circle.

After the individual mat time, the session begins with several minutes of relaxation techniques. Formal sessions include segments of social support and patient-directed discussion. Participants are encouraged to reflect and share feelings and beliefs that might otherwise not be discussed, leading to enhanced relationships (Rising et al., 2004). As women share their experiences, an atmosphere of support and empowerment develops, facilitating trust (Rising, 1998). Women learn to depend on group members for educational and emotional support (Rising et al., 2004). Feeling alone, overwhelmed, or unable to cope well with the responsibilities of new motherhood are a few commonalities described by women suffering from postpartum depression. Support groups offer a cohesiveness that helps women realize they are not alone (Beck, 2006).

Scheduling is a critical factor in implementing Centering Pregnancy. Hackley, Applebaum, Wilcox, and Arevalo (2009) examined two methods of scheduling as it affected group participation. This study was conducted in a health clinic in the Bronx where one third of the residents lacked a primary care provider, one third of pregnant women received late or no prenatal care, and the teen pregnancy rate was almost double the national average. All English-speaking women receiving prenatal care in this clinic, regardless of risk status, were offered group prenatal care. A total of 114 women participated in 13 groups. Outcomes analyzed included gestational age at enrollment to group prenatal care, attendance, and referral rates. Centering Pregnancy Groups 1 through 7 included 55 women who were referred to a provider availability–based system. They were compared to 59 women in Groups 8 through 13, who were referred based on estimated due date (EDD). There were no statistically significant differences in demographics among the groups (Hackley et al., 2009).

The EDD groups were enrolled at an earlier gestational age than the provider availability groups, although the difference was not statistically significant ($p = .058$). The EDD system of scheduling resulted in less variance in gestational age at enrollment, 16 to 18 weeks for the EDD-based system versus 10 to 24 weeks in the provider availability system. There was a significant difference in the maximum gestational age of enrollment between the groups ($p = .002$). There was a significant difference in the number of sessions offered in the EDD-based system, 8.2 compared to 6.7 in the provider availability system ($p < .001$; Hackley et al., 2009).

Barriers to implementation of group prenatal care in this study included provider reluctance to refer patients to group care, patient reluctance to change provider, space availability, and problems with scheduling. The researchers noted that more widespread use of Centering Pregnancy by other health care facilities could ease the task of enrolling a sufficient number of participants into group care by minimizing the need for women to change providers and allowing more time for educational activities (Hackley et al., 2009).

THE EVIDENCE FOR BEST PRACTICE

There is limited Level 1 research comparing outcomes of group prenatal care with the traditional model of care. Centering Pregnancy is a relatively new concept, a midwifery-led model of care in the United States where prenatal care is primarily

provided by physicians. "The paucity of funded and published research on centering is one of the great impediments to demonstrating its value, as well as to disseminating the model" (Novick, 2004, p. 408). More research is needed to compare outcomes as well as distinguish problems implementing the model.

Birth Weight and Gestational Age

Ickovics et al. (2003) examined the impact of group versus individual prenatal care on birth weight and gestational age. In a prospective, matched cohort study, 458 pregnant women in Atlanta, Georgia and New Haven, Connecticut were studied. Only healthy women enrolled in prenatal care prior to 24 weeks were included. Birth weight for infants in group prenatal care was greater than for those in traditional care ($p = .01$). The weight of preterm infants birthed by mothers in group prenatal care was also higher than that of preterm infants whose mothers received traditional care ($p < .05$). The difference was 2398 grams versus 1999 grams. There was a trend, although not statistically significant, toward fewer low-birth weight babies among the group prenatal care patient (Ickovics et al., 2003).

Knowledge and Social Support

Baldwin (2006) studied the effect of traditional prenatal care versus group prenatal care on selected pregnancy outcomes, maternal knowledge of pregnancy, social support, health locus of control, and satisfaction. This study was a nonequivalent control group, pretest/posttest design conducted at three sites ($n = 98$). Forty-eight patients were enrolled in traditional care, and 50 were enrolled in group care. Patients self-selected preference for type of care. The following four instruments were used for data collection:

- A pretest/posttest;
- Rising's Pregnancy Review Sheet;
- De Vellis's Health Locus of Control Tool; and
- Labs and Wurtele's Fetal Health Locus of Control (defined as the pregnant woman's perceived control over her unborn child's health; Baldwin, 2006).

Among the Centering Pregnancy participants, there was a significant difference in maternal knowledge of pregnancy from the mean pretest score of 10.4 and the mean posttest score of 11.38 ($p = .03$). The results did not show a difference in perceived social support from significant other, nurse-midwife, and other pregnant women between the group receiving traditional care and the Centering Pregnancy group. There was no significant difference between the groups on fetal health locus of control. High pretest scores (almost identical to the posttest scores) on the other variables contributed to a ceiling effect (no room for improvement) and may have limited the significance of the findings (Baldwin, 2006).

One problem identified in the study was the timing of the posttests. The traditional care group was given the posttest earlier in pregnancy (32 weeks and beyond) than the Centering Pregnancy group (38–40 weeks). This study did show increased

knowledge among the Centering Pregnancy group. However, findings of increased social support, fetal health locus of control, sense of participation, and satisfaction were not supported. Limitations of this study were small sample size, self-selection of participants to their preferred method of care, and lack of consistency in posttest administration (Baldwin, 2006).

Kennedy et al. (2009) randomly assigned 322 women into group prenatal care or individual care at two military health care facilities. A total of 234 women were interviewed during the postpartum period. In this qualitative study, three themes were identified by the authors as significant: the potential for continuity of care, a sense of community with other women and their families, and the leading identified theme, "I wasn't alone."

Outcomes Among Adolescents

Pregnancy in an adolescent can result in feelings of isolation from peers, increased stress, and difficulty dealing with body image and self-esteem. Adolescent pregnancy represents a developmental threat (Grady & Bloom, 2004). Centering Pregnancy can be an excellent alternative to traditional prenatal care in the adolescent pregnant population, providing a safe, supportive, and empowering environment, all characteristics important for adolescent development (Moeller et al., 2007). An early pilot study conducted by Fullar, Lum, Sprik, and Cooper (1988) focused on group self-care among pregnant teens. Patients checked each others, fundal heights, as well as tested and charted their weights and urine samples. Prenatal education and group discussion were emphasized. This pilot study, although low level in terms of quality of evidence, demonstrated positive outcomes and recommended further study.

Grady and Bloom (2004) examined selected outcomes among 124 pregnant adolescents in the Centering Pregnancy care program at Barnes-Jewish Hospital. The following research questions were addressed by the authors:

- What are the health visit rates for adolescents in Centering Pregnancy groups?
- What are the perinatal outcomes for adolescents in Centering Pregnancy groups? and
- What is the level of satisfaction for teens in Centering Pregnancy groups? (p. 414)

The findings among those adolescent mothers in the Centering Pregnancy group demonstrated a preterm birth rate of 10.5%, a cesarean section rate of 13.7%, a breastfeeding rate at discharge of 46%, and an identified pediatric provider at the time of birth of 79%. Satisfaction with the Centering Pregnancy model of care was high among the mothers, with a survey response rate of 69% and satisfaction rating of 9.2 on a scale of 10. When asked what appealed to them about the program, participants responded that they did not feel alone (Grady & Bloom, 2004).

A study by Hoyer, Jacobson, Ford, and Walsh (1994) randomly assigned adolescents to experimental and control groups, focusing on self-care, prenatal behaviors, and increased education. The purpose of the study was to determine if increased

education and self-care would change sexual behavior and pregnancy recidivism. A decrease in subsequent pregnancy within 2 years was statistically significant. Although postpartum depression was not a focus of this study, the study also demonstrated the benefit of group care in motivation for self-care.

Compared with adult pregnant women, adolescents have higher rates of preterm and low-birth weight babies (Moeller et al., 2007). In 2007, Ickovics et al. examined selected pregnancy outcomes among adolescent group prenatal care patients. This randomized controlled trial was conducted at two university-affiliated hospital prenatal clinics. Adolescent pregnant women ($n = 1047$) between ages 14 and 17 years were randomly assigned to either group or traditional care. The women assigned to group prenatal care had a preterm birth rate of 9.8% compared to 13.8% in the traditional care group, a risk reduction of 33%. Additionally, group prenatal care participants had better prenatal knowledge ($p < .001$) and felt more prepared for labor ($p < .001$). The 2007 findings by Ickovics et al. support the hypothesis that group prenatal care results in perinatal outcomes that are equal to or better than those of patients in traditional care.

Patient Preferences

A qualitative study by Mellor and Chambers (1995) revealed that women desired group prenatal care. Investigators individually interviewed 52 British women and also conducted two focus groups composed of 14 participants. Interviews and discussions focused on patients' feelings about routine prenatal care. Women discussed a need for support in pregnancy, favoring small group sessions as opposed to individual office visits. Based on study findings, prenatal visits were converted to small group sessions with women of similar age and gestation. This study was of a moderate quality level with an adequate sample size. A comparison of data from individual interviews and focus groups by Mellor and Chambers revealed that comments were similar, strengthening the evidence that small groups of women receiving prenatal care and education find greater social support, have increased positive birth outcomes, and decreased postpartum depression.

CENTERING PREGNANCY: EVIDENCE-BASED BEST PRACTICE

Centering Pregnancy, as an example of best practices in midwifery care, is designed to attend to women's physiologic and psychosocial needs while educating and encouraging responsibility for their own health care in a supportive environment (Rising, 1998). Education and social support may lead to empowerment and healthy behaviors. A sense of empowerment paired with a supportive network and education may increase self-esteem and coping mechanisms (Novick, 2004). Education, empowerment, and social support may also decrease stress, thus increasing awareness of complications (such as perinatal depression) and increasing healthy behaviors (Novick, 2004). Women participating in the Centering Pregnancy model may have better prenatal and postnatal outcomes, as they may take a proactive stance in their own health care while developing a network of support that may last beyond pregnancy (Rising, 1998).

Centering Pregnancy exemplifies an evidence-based best practice for nurse-midwives. It increases efficiency in patient teaching and increases the amount of provider–patient time (Morse, 2009), offering an innovative approach to time constraints for both the patient and the provider (Rising, 1998). Women who participate in the Centering Pregnancy model of care have 10 times more time with their provider, 20 hours compared to 3.5 hours in traditional care. They are less likely to have a premature birth, report less stress, have bigger babies on average regardless of gestational age, and report greater satisfaction with care. Centering Pregnancy is an evidence-based best practice built on the midwifery model of care.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 3.1

Centering Pregnancy

Mary, a certified nurse-midwife (CNM), practices full-scope midwifery in a self-owned clinic in a low-resource, inner city community where women do not regularly access prenatal care, and the preterm birth rate is very high. Mistrust of health care providers is a common thread among members of the community. Mary finds the traditional model of prenatal care delivery does not work well in her practice.

She has read numerous articles reporting growing evidence that Centering Pregnancy has shown positive outcomes, including a decrease in preterm births and low-birth weight infants, increased educational opportunities, a supportive network, and empowerment for women.

Mary initially went to the key stakeholders in her practice—board members, a consulting obstetrician/gynecologist, nurses, and technical staff. After she presented the evidence, the key stakeholders supported her efforts to plan and implement a Centering Pregnancy program of prenatal care. With this support, Mary held several focus groups with women in her prenatal clinic. The women showed interest and responded positively to the idea of group prenatal care.

To facilitate implementation and program development, Mary and the clinic staff attended a training workshop offered by the Centering Healthcare Institute. After the workshop, recognizing that change is never easy; Mary identified a framework for adopting organizational and cultural change from traditional to group prenatal care. Educational sessions were provided for staff and community members in various venues, such as informative luncheons, continuing education offerings, public discussions, and popular radio appearances. The Centering Pregnancy model of prenatal care was advertised at the practice site and in the community through flyers, posters, and public announcements in local newspapers and on the radio.

(continued)

CASE STUDY *(continued)*

After appropriate planning and community involvement, Mary was finally ready to enroll her first group. She actively sought funding to sustain the program. After implementing group prenatal for 1 year, she tracked an increase in prenatal attendance and a decrease in preterm and low-birth weight infants in her practice. She has continued to receive positive feedback from staff and participating patients and currently has four active centering groups.

Exemplar of Best Practice

Using essential skills in problem identification and synthesis of the evidence, Mary identified a need and a best practice in the management of prenatal and postnatal pregnancy care. She involved the community and stakeholders in the process, improving the potential for success in implementing this change in practice, and demonstrated improved outcomes for the infants in her community.

REFERENCES

Baldwin, K. A. (2006). Comparison of selected outcomes of Centering Pregnancy versus traditional prenatal care. *Journal of Midwifery & Women's Health*, *51*(4), 266–272. doi:10.1016/j.jmwh.2005.11.01.1

Beck, C. T. (1999). Postpartum depression. Stopping the thief that steals motherhood. *AWHONN Lifelines*, *3*(4), 41–44.

Beck, C. T. (2006). Postpartum depression: It isn't just the blues. *American Journal of Nursing*, *106*(5), 40–50.

Beck, C. T., & Indman, P. (2005). The many faces of postpartum depression. *Journal of Obstetrics, Gynecologic, and Neonatal Nursing*, *34*(5), 569–576.

Breckinridge, M. (1981). *Wide neighborhoods: A story of the Frontier Nursing Service*. Lexington, KY: University Press of Kentucky.

Chen, C. H., Tseng, Y. F., Chou, F. H., & Wang, S. Y. (2000). Effects of support group intervention in postnatally distressed women. A controlled study in Taiwan. *Journal of Psychosomatic Research*, *49*(6), 395–399.

Fullar, S. A., Lum, B., Sprik, M. G., & Cooper, E. M. (1988). A small group can go a long way. *The American Journal of Maternal Child Nursing*, *13*(6), 414–418.

Grady, M. A., & Bloom, K. C. (2004). Pregnancy outcomes of adolescents enrolled in a Centering Pregnancy program. *Journal of Midwifery & Women's Health*, *49*(5), 412–420.

Greenberg, R. (1983). The impact of prenatal care in different social groups. *American Journal of Obstetrics and Gynecology*, *145*(7), 797–801.

Hackley, B., Applebaum, J., Wilcox, W. C., & Arevalo, S. (2009). Impact of two scheduling systems on early enrollment in a group prenatal care program. *Journal of Midwifery & Women's Health*, *54*(3), 168–175.

Harvey, S., Rach, D., Stainton, M. C., Jarrell, J., & Brant, R. (2002). Evaluation of satisfaction with midwifery care. *Midwifery*, *18*(4), 260–267.

Hatem, M., Sandall, J., Devane, D., Soltani, H., & Gates, S. (2008). Midwife-led versus other models of care for childbearing women. *Cochrane Database of Systematic Reviews*, *4*, 1–22.

Hoyer, P. J., Jacobson, M., Ford, K., & Walsh, E. (1994). Pregnancy care for the adolescent. *Nurse Practitioner*, *19*(4), 27–28, 31–32.

Ickovics, J., Kershaw, T. S., Westdahl, C., Magriples, U., Massey, Z., Reynolds, H., & Rising, S. S. (2007). Group prenatal care and perinatal outcomes: A randomized controlled trial. *Obstetrics and Gynecology*, *110*(2 Pt. 1), 330–339.

Ickovics, J., Kershaw, T. S., Westdahl, C., Rising, S. S., Klima, C., Reynolds, H., & Magriples, U. (2003). Group prenatal care and preterm birth weight: Results from a matched cohort study at public clinics. *The American College of Obstetricians and Gynecologists*, *102*(5 Pt. 1), 1051–1057.

Institute of Medicine. (2002). Crossing the quality chasm: A new health system for the 21st century. *Journal of the American Medical Association 287*(5), 646–647.

Kennedy, H. P., Farrell, T., Paden, R., Hill, S., Joliet, R., Willetts, J., & Rising, S. S. (2009). "I wasn't alone"—A study of group prenatal care in the military. *Journal of Midwifery & Women's Health*, *54*(3), 176–183.

Locicero, A. K., Weiss, D. M., & Issokson, D. (1997). Postpartum depression: Proposal for prevention through an integrated care and support network. *Applied and Preventive Psychology*, *6*(4), 169–178.

Massey, Z., Rising, S. S., & Ickovics, J. (2006). Centering Pregnancy group prenatal care: Promoting relationship-centered care. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *35*(2), 286–294.

Mellor, J., & Chambers, N. (1995). Addressing the patient's agenda in the reorganization of antenatal and infant health care: Experience in one general practice. *British Journal of General Practice*, *45*(397), 423–425.

Moeller, A., Vezeau, T., & Camancho Carr, K. (2007). Centering Pregnancy: A new program for adolescent prenatal care. *The American Journal for Nurse Practitioners*, *11*(6), 48–58.

Moos, M. K. (2006). Prenatal care: Limitations and opportunities. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *35*(2), 278–285.

Morse, S. (2009). Group healthcare visits: Current models of care. *The American Journal for Nurse Practitioners*, *13*(10), 52–58.

Novick, G. (2004). Centering Pregnancy and the current state of prenatal care. *Journal of Midwifery & Women's Health*, *49*(5), 405–411.

Rising, S. S. (1998). Centering pregnancy. An interdisciplinary model of empowerment. *Journal of Nurse-Midwifery*, *43*(1), 46–54.

Rising, S. S., Kennedy, H. P., & Klima, C. S. (2004). Redesigning prenatal care through Centering Pregnancy. *Journal of Midwifery & Women's Health*, *49*(5), 398–404.

U.S. Department of Health and Human Services. (1989). *Caring for our future: The content of prenatal care. A report of the Public Health Service Expert Panel on the content of prenatal care* (NIH Publication No. 90-3182). Bethesda, MD: Author.

Varney, H., Kriebs, J. M., & Gegor, C. L. (2004). *Varney's midwifery* (4th ed.). Sudbury, MA: Jones and Bartlett.

Therapeutic Presence and Continuous Labor Support: Hallmarks of Nurse-Midwifery

4

Robin G. Jordan

WOMAN-CENTERED CHILDBIRTH

Childbearing is a major transformative life event that is both physically and emotionally demanding. The emotional processes that start in pregnant women and continue during the process of birth have a major impact on the evolving mother–child relationship (Wiklund, Edman, Larsson, & Andolf, 2009). A woman-centered approach to childbirth services acknowledges and attends to the psychological and social components of childbearing. Attention to these components during labor and birth is essential to a woman's feelings of mastery and satisfaction with this pivotal life experience. Research has repeatedly documented that attending to a woman's psychological and social needs via therapeutic presence and continuous labor support improves maternal and infant health outcomes (Hodnett, Gates, Hofmeyr, Sakala, & Weston, 2011).

One of the defining hallmarks of nurse-midwifery practice within the philosophy of care of the American College of Nurse-Midwives (ACNM, 2007) is the therapeutic value of human presence. Therapeutic presence is a human-to-human interaction that embodies caring behaviors and a supportive demeanor to help others in need (Folkman & Lazarus, 1988; Hodnett, 2002; Schaeffer, Coyne, & Lazarus, 1981). Labor support embodies therapeutic presence (Barrett & Stark, 2010; Sauls, 2004) and is an intentional tool provided to laboring women to improve outcomes. Current mainstream obstetrical practice substitutes technology for physical and emotional care. In hospital birth settings, it is common for continuous labor support to be overshadowed by the focus on the biomechanics of labor and birth and its attendant technology (Hayes, 2010). In most hospital settings, labor support is considered less important than the management of the biomechanics of birth. Substituting routine application of technology to the normal birth process for human support has created high rates of medical intervention with adverse effects (Coalition for Improving Maternity Services, Expert Work Group, 2007). Despite commitment to supporting women with therapeutic presence and

continuous labor support to achieve a normal birth, even nurse-midwives find it challenging in today's hospital-based childbearing culture to implement these practices (Sakala & Corry, 2008).

Therapeutic Presence and Continuous Labor Support

Therapeutic presence includes three elements:

- Emotional support, including physical presence, encouragement, reassurance, and a sense of security;
- Tangible assistance, including direct care and comfort measures; and
- Knowledge support, including explanation, advice, and information (Folkman & Lazarus, 1988; Hodnett, 2002; Schaeffer et al., 1981).

Lehrman (1988) developed a theoretical framework to describe relationships among nurse-midwifery care, psychosocial outcomes, and maternal psychosocial variables. Through her work, a construct for the concept of therapeutic presence was developed, summarized as "one on one personal attention and availability of the nurse-midwife for the woman in labor" (p. 44). Lehrman's research demonstrated that positive therapeutic presence by nurse-midwives increases a woman's self-esteem and satisfaction with the labor experience.

Labor support is the work of personal caring and support behaviors provided to the laboring woman and encompasses the dimensions of therapeutic presence. Continuous labor support is the third of six practices advocated to support normal birth as endorsed by the Lamaze International (2007). The specific behaviors of labor support can be categorized into three areas, which encompass the elements of therapeutic presence: emotional support, physical care and comfort, and advocacy for the laboring woman (Barrett & Stark, 2010; Sauls, 2004).

Emotional support behaviors are defined as a continuous human presence, providing reassurance, verbal support, and encouragement; exhibiting a caring attitude; providing care to the laboring woman's partner; and attending to spiritual aspects of the experience (Adams & Bianchi, 2008). Verbal encouragement that fosters a sense of ability to cope with the challenge of labor pain enhances the woman's ability to overcome fears and self-doubt about coping with pain and leads to feelings of pride, elation, and empowerment after birth (Leap, Sandall, Buckland, & Huber, 2010).

Physical care behaviors are directed toward providing comfort during labor and birth. These specific behaviors include repositioning and enhancing mobility, using therapeutic touch, massage, providing warm water therapy via tub or shower, providing for fluid intake, helping the woman maintain an empty bladder, using cold or hot compresses, and modifying the environment, for example, diminishing lighting and noise levels (Payant, Davies, Graham, Peterson, & Clinch, 2008). Providing physical care that promotes comfort during labor can enhance a woman's sense of control and confidence in her labor experience (Schuiling & Sampselle, 1999). A woman's perspective of her control and mastery during childbirth has been demonstrated to be a key component in maternal satisfaction with the childbirth experience (Ford, Ayers, & Wright, 2009).

Advocacy for the laboring woman is defined as providing a voice for the woman while she is focusing on the work of labor and protecting her from unwanted and/or unnecessary interventions. Advocacy is achieved by the support person acting as the woman's voice for making her needs known when she has turned inward, performing the work of labor, and protecting her from unnecessary intrusions and interruptions. When advocating for the laboring woman, the support person must convey respect, acknowledge the mother's expectations, and resolve conflict (Adams & Bianchi, 2008). A large body of evidence consistently documents benefits of continuous therapeutic labor support among women worldwide and across socioeconomic strata. Because continuous labor support is an evidence-based practice to improve maternal and infant outcomes, the question then becomes, "Why is this support not the standard of care within maternity units in U.S. hospitals?"

Barriers to Therapeutic Presence and Continuous Labor Support

Birth is unlike all other conditions that are dealt with in a hospital setting. Hospital-based birth is technology and provider driven (Sakala & Corry, 2008). The hospital is not an environment that generally places the woman at the center of decision making or moves with her intrinsic timing during the labor process (McCourt, 2009). Further, the transfer of research findings validating evidence-based practice is frequently obstructed by multiple barriers unrelated to the research findings (Graham, Logan, Davies, & Nimrod, 2004).

Institutional Barriers

Institutional policies are often directed toward meeting provider needs of efficiency, time management, and rapid outcome. Providers often control the timing of birth, obstetrical unit workflow, and their discomfort with the sounds of labor (McCourt, 2009). Induction of labor for improved physician lifestyle as well as productivity and reimbursement issues has become a common medical practice in the last decade (Simpson, 2010). Anesthesia department policies may include rounding on each laboring woman, even if uninvited, to offer epidural anesthesia services in order to generate income (Sakala & Corry, 2008). A dedicated support person providing therapeutic presence and continuous labor support becomes interference in a well-oiled production line (Martin, 2001). Hospital staffing often precludes one-to-one nursing care and support for each laboring woman. Remote monitoring systems allow nurses to observe the labor patterns of multiple women at one time. It is an efficient method to care for several women at once, saving hospital dollars on nursing staff. Each woman's labor is an unknown as to time, process, and maternal and fetal reaction. This makes staffing needs and length of stay times difficult to predict. Hospital practices are geared toward eliminating uncertainty by controlling labor timing and process (elective induction or cesarean birth) and eliminating unknown reactions from women (epidural anesthesia). This scenario provides an operationally efficient unit, albeit at the expense of an individual woman's needs and desires.

Barriers for Labor Nurses

Young labor nurses and nursing students lack role models and mentoring in promoting the normalcy of birth and in advocating for continuous labor support. They may never see birth occur under a woman's own power and they lack skill in labor support (Sleutel, Schultz, & Wyble, 2007). Although older and more experienced nurses are more likely to provide labor support (Barrett & Stark, 2010), they are often expected to do so with minimal guidelines or formal instruction on effective support measures (Sauls, 2006). The nurses report being unable to provide labor support while caring for more than one woman (Barrett & Stark, 2010) and perceive that women with epidural analgesia need minimal support (Payant et al., 2008). Nurses may be unaware of the benefits of labor support. As a measure to manage information overload, maternity care curricula in some baccalaureate programs have been modified to cover "what nurses actually do with the majority of patients" (Forbes & Hickey, 2009). Unfortunately, the majority of nurses working within labor and birth units in the United States do not provide labor support, thus this content many not be taught. Assuming new nurses possess knowledge of the benefits and methods of continuous labor support, new graduates quickly modify care practices to conform to expected practice norms in order to feel competent within the group they are joining (Mooney, 2007).

Barriers for Childbearing Women

Birthing women face multiple barriers in receiving the therapeutic presence and continuous labor support needed for optimal childbearing. These barriers include the cost and accessibility of doulas, lack of institutional valuing of the benefits of therapeutic presence, and an environment of conflict that punishes any positive deviance from institutional norms (McCourt, 2009). The lack of nurse-midwifery services in many areas of the United States also leaves women with fewer options for support during hospitalized labor and birth.

The Western concept of pain as a purely physiologic occurrence without purpose and the need to avoid pain at all costs affects how providers, women, their partners, and the general society perceive labor and birth. The idea of pain in childbirth has eclipsed the event of giving birth itself as an experience with inherent meaning and significance, deserving of distinct treatment (Wolf, 2009). Significant cultural barriers and socialization of girls and young women create an environment of fear and avoidance on the topic of childbirth.

Negative Implications With Neglect of Continuous Labor Support

Overuse of childbirth technology for nontherapeutic reasons is wasteful of both human resources and health care dollars as well as unethical. However, the physical and emotional costs to women are even greater. Concerns stemming from the almost universal use of labor epidurals during normal labor, the escalating cesarean birth rate with its attendant placental problems in subsequent

pregnancies, repeat operative deliveries, and widespread professional neglect of evidence around the safety of vaginal birth after cesarean (VBAC) are covered elsewhere in this book.

Less apparent are the psychosocial and emotional effects of highly interventive birth coupled with lack of therapeutic presence and continuous labor support. Recent research is documenting links among lack of support, negative birth experiences, and stress disorders. A phenomenological descriptive study was conducted with women pregnant with their second child who reported intense fear of birth due to a prior negative birth experience. All participants cited lack of support during labor as a primary source of their prior negative experience (Nilsson, Bondas, & Lundgren, 2010).

Negative birth experiences have been associated with the development of postpartum depression and posttraumatic stress disorder (PTSD). Although complicated instrumental and operative birth can be associated with PTSD, many women with severe PTSD symptoms have had a normal vaginal birth (Ayers & Ford, 2009). Research by Ford and Ayers (2008) investigated how stressful labor events and support from hospital staff affect a woman's anxiety and perception of control. Findings indicated that a woman's emotional and anxiety reactions are affected more by the level of support they receive during birth than by the level of complications or interventions during birth.

Research findings suggest that meeting a woman's innate social need for therapeutic presence and support is highly relevant to reducing emotional trauma and pathology after birth. Those providing care to childbearing women need to acknowledge the high prevalence of PTSD diagnosis among postpartum women and examine how emotional trauma can be avoided through providing continuous labor support.

THERAPEUTIC PRESENCE AND CONTINUOUS LABOR SUPPORT: EVIDENCE FOR BEST PRACTICE

Birth Outcomes

A large body of evidence documents the positive influence of continuous labor support on maternal and fetal outcomes across socioeconomic strata and nations. A landmark meta-analysis of six randomized controlled trials (RCTs) was conducted in South Africa, Canada, Guatemala, the United States, and Finland in 1999. Findings indicated that among women receiving continuous labor support, cesarean births were reduced by 50%, epidural anesthesia births were reduced by 60%, and the use of pain medication was reduced by 30% (Klaus, Kennell, Berkowitz, & Klaus, 1992). An RCT done by McGrath and Kennell (2008) with 420 middle-class women in the United States demonstrated that continuous labor support significantly reduced the incidence of cesarean birth and the need for analgesia and increased positive feelings women had about their childbirth experience.

The Cochrane systematic review entitled "Continuous Support for Women during Childbirth" presents compelling evidence of the benefits of continuous labor support. This meta-analysis included 21 clinical trials from 15 countries examining

more than 15,000 childbearing women in a variety of settings (Hodnett et al., 2011). Outcome benefits are consistent and significant. Women with continuous one-to-one labor support had

- shorter labors,
- fewer cesarean births,
- less need for analgesia and anesthesia,
- reduced use of synthetic oxytocin in labor,
- greater maternal satisfaction with the childbirth experience, and
- enhanced coping skills during the experience.

Infant outcomes were also improved. Babies born to women with continuous labor support had higher Apgar scores. Cochrane reviewers concluded that continuous labor support is a no-risk intervention that substantially improves outcomes and should be provided to all women throughout labor (Hodnett et al., 2011).

Unlike other interventions that are used routinely in childbirth, such as continuous electronic monitoring (Level C evidence—a consensus opinion), the intervention of continuous labor support is Level A evidence (consistent with science and highly reliable). Ordinary intuition informs us that human touch and supportive care during the profound experience of labor and birth can have powerful and positive effects on a woman in labor. Twenty-first century clinical research firmly supports this intuitive assertion.

Positive Physiological Responses to Continuous Labor Support

The positive maternal outcomes of continuous labor support are likely due to the physiologic response to this kind of support. The fight-or-flight stress response is generated by the laboring woman's sympathetic nervous system in response to the stress of labor pain, anxiety, and fear. This response increases production of the catecholamines, epinephrine, and norepinephrine. Increased epinephrine can negatively influence fetal heart rate (FHR) patterns, causing providers to interpret fetal distress and initiate a cascade of technological interventions (Lederman, Lederman, Work, & McCann, 1981). Animal and human research indicates that when catecholamine levels increase in labor, they block release of oxytocin from the posterior pituitary, uterine contractions are decreased, and blood flow to the uterus and placenta is reduced. The decrease in uterine blood flow sets up a cascade of interlocking events: reduced uterine contractility and slower dilation of the cervix making for a longer labor (Kennell, Klaus, McGrath, Robertson, & Hinkley, 1991; Lederman et al., 1981; Simkin & Ancheta, 2010). Increased catecholamine secretion also increases pain perception (Simkin & O'Hara, 2002).

The laboring environment can influence this fight-or-flight response and increase in catecholamines and epinephrine. Individuals engaged in continuous labor support help to manage the birth environment as part of comfort and advocacy behaviors to reduce interruptions for the laboring woman and to promote labor progress. Hospital rooms are generally perceived by patients and hospital

staff to be a space that belongs to the staff not the patient, and therefore they enter and manage the environment at will (Taylor, 1979). Auditory, physical, and spatial intrusions by various unknown personnel for examinations, procedures, cleaning, and restocking supplies are common in a hospital setting. Providing a measure of personal control over visual access, bodily exposure, family visitation, as well as meeting emotional and physical needs allows the woman to respond to labor unimpeded and focus on the work of laboring and birthing.

Mediating the birthing environment can also influence labor progress. For example, lighting may help or hinder a woman's physiologic labor processes. Our bodies increase production of melatonin, the hormone responsible for inducing sleep, in darkness and, in most humans, melatonin levels peak in the early hours of the morning. Melatonin synergizes with oxytocin to promote uterine smooth muscle contractions and to facilitate the gap junction activity required for effective labor (Sharkey, Puttaramu, Word, & Olcese, 2009). It is reasonable to conclude that laboring women may benefit from lower light levels to enhance melatonin production.

Women who are well supported during labor and birth are more likely to have freedom of movement to assume positions that facilitate labor progress, avoiding the need for exogenous oxytocin (Romano & Lothian, 2008). Endogenous oxytocin is sometimes called the hormone of love because of its role in regulating emotion, sexual activity, orgasm, birth, and breastfeeding. It is released from the hypothalamus gland to initiate the rhythmic uterine contractions of labor. At the end of labor, the stretch receptors in the lower vaginal vault give positive feedback to the pituitary to release large amounts of oxytocin to coordinate the final powerful uterine contractions, promoting rapid passage of the fetal head, termed the *fetal ejection reflex*. Additional oxytocin is released postbirth in response to skin-to-skin contact with the infant and breast stimulation with breastfeeding. These physical events protect the mother against hemorrhage.

Tethering the woman during labor is a key factor precipitating the cascade of events that results in a high level of intervention as well as dampening down the effects of naturally produced oxytocin. Continuous labor support promotes the natural production of oxytocin and helps inhibit stress response, thus promoting increased mobility, maternal relaxation, cervical muscle dilation rate, and increased pelvic capacity—a variable in promoting fetal passage through the pelvis and soft tissues (Romano & Lothian, 2008).

Oxytocin has important roles beyond the birthing period. It is linked with establishing mothering behaviors, altruistic and adaptive behaviors, slowing heart rate, and reducing blood pressure (Buckley, 2003; Gutkowska, Jankowski, Mukaddem-Daher, & McCann, 2000). Research also demonstrates that malfunction in the production of oxytocin is implicated in autism spectrum disorders, drug dependency behaviors, and schizophrenia (Bartz & Hollander, 2008; Heinrichs, von Dawans, & Domes, 2009). Science does not yet fully understand the significance of endogenous oxytocin. However, current scientific evidence strongly favors care practices that facilitate a woman's oxytocin production during labor.

Continuous Labor Support and Birth Satisfaction

Women receiving continuous labor support report high levels of satisfaction and positive memories of the birth experience (Harvey, Rach, Stainton, Jarrell, & Brant, 2002; McGrath & Kennell, 2008). A sustaining human presence during labor decreases pain, anxiety, and fear that detract significantly from positive memories and perceptions of birth (Hodnett, 2002; Waldenström, 2004). Bryanton, Gagnon, Johnston, and Hatem (2008) examined factors that influence a woman's perceptions of her childbirth experience. Of the 20 predictors of a woman's childbirth perceptions, the two strongest were type of birth and the degree of awareness, relaxation, and control she had during labor and birth. Receiving therapeutic presence from a knowledgeable person throughout labor and birth increases the woman's sense of control and self-confidence with the birth experience (Bryanton et al., 2008; Hayes, 2010).

A systematic review examined 137 studies of factors that influenced women's satisfaction with the childbirth experience (Hodnett, 2002). Three factors emerged from the data as influencing birth satisfaction more powerfully than pain experienced, analgesia or anesthesia used, or medical interventions:

- Personal expectations. Women who had high expectations of the birth experience that were met or exceeded expressed high satisfaction.
- Labor support and caregiver communication. Continuous labor support along with good communication was a strong predicative of satisfaction with childbirth.
- Personal control and involvement with decision making. Women who felt they had control over what happened to them during labor and birth reported high satisfaction (Hodnett, 2002).

Other studies since that meta-analysis have confirmed the strong link between continuous labor support and satisfaction with birth. An RCT of 420 middle- and upper-class women examined the influence of continuous labor support by a doula. All women in the doula group rated the doula's presence as *positive* to *very positive* during labor and birth and said it enhanced the birth experience (McGrath & Kennell, 2008). In an effort to determine relationships among labor support from nurses, stress during childbirth, and perceptions of the childbirth experience, a questionnaire was administered to 122 new mothers 1 to 2 days after giving birth (Srisuthisak, 2009). Stress reduction due to support received from the nursing staff was a significant predictor of a positive childbirth experience. Childbirth is a significant event in a woman's life; indeed, many women characterize it as the most important event in their lives. Childbirth memories are vivid, poignant, and deeply felt even 15 to 20 years after the birth (Simkin, 1992). Attending to a woman's need for therapeutic support during labor has long-term positive effects on satisfaction with childbearing experiences (Waldenström, 2004)

Although continuous therapeutic labor support can be provided by a variety of individuals, studies suggest that support provided by an experienced person, such as a birth doula or nurse-midwife, who is not in the woman's social support group

or family is most beneficial to women (Campbell, Lake, Falk, & Backstrand, 2006; Hodnett et al., 2011; Pascali-Bonaro & Kroeger, 2004). Although women have been serving as doulas throughout time, birth doulas have experienced a surge in popularity in the last two decades, providing emotional, physical, and informational support to a woman and her family during labor.

The Cochrane systematic review examined the effect of support from those in a woman's social network, hospital nursing staff, and companions intentionally chosen by the woman to provide labor support, such as a doula or nurse-midwife (Hodnett et al., 2011). Labor support provided by a person from the woman's social network, such as a partner or friend, increased satisfaction with the birth experience but did not influence other factors such as length of labor or the use of medical interventions. Labor support provided by a nurse did not have any detected influence on maternal satisfaction with the birth experience or cesarean birth rates. However, women who received continuous labor support care provided by a knowledgeable companion for the purpose of labor support, such as a doula, were

- 28% less likely to have a cesarean birth,
- 31% less likely to use synthetic oxytocin to augment labor,
- 9% less likely to use any pain medication, and
- 34% less likely to rate their childbirth experience negatively (Hodnett et al., 2011).

Continuous support that begins earlier in labor appears to be more effective than support that begins later in labor. Labor support from fathers did not appear to confer the same outcome benefits as support from a doula or midwife (Scott, Klaus, & Klaus, 1999).

CONTINUOUS LABOR SUPPORT: BEST PRACTICES

Exemplary midwives and midwifery educators consider continuous one-to-one labor support to be an expected behavior of nurse-midwives (Kennedy, 2000; Rooks, 1999). Laboring women also highly value and expect this behavior (Bryanton et al., 2008). In actual practice, this translates into using time-intensive physical and emotional energy to encourage, support, and comfort women during active labor, which highly impacts staffing patterns. The daily life of a nurse-midwife is physically and emotionally demanding, and optimal scheduling for both personal life and client needs can be challenging. Scheduling call days separate from office days, and developing team caseloads in large practices can allow for more time-intensive, one-to-one labor care (Page & McCandlish, 2006). Supporting partner midwives in their efforts to provide continuous labor support is crucial.

Educators need to be cognizant of the opportunities afforded by nurse-midwifery students to learn and practice behaviors of therapeutic continuous labor support. Students may or may not experience providing continuous labor support when they are in their clinical rotations. Although it is well known that young

labor nurses and nursing students often lack role models and mentoring in promoting the normalcy of birth (Sleutel et al., 2007), the question arises whether nurse-midwife students observe and are mentored in exemplary midwifery practice, including therapeutic presence and continuous labor support. Lange (see Lange & Kennedy, 2006) asked new midwifery graduates to rate select dimensions of nurse-midwifery practice on two items: the importance they placed on dimensions of midwifery practice and how much emphasis they observed their preceptors placing on that practice. "Support for the normal processes of birth" had the highest degree of incongruence between stated importance placed on this value and actual preceptor practice behaviors. While supporting the normal processes of birth is idealized and espoused as an important part of midwifery philosophy of care, Lange's study indicated that this concept was not reflected in care practices among the majority of preceptors in her study sample (Lange & Kennedy, 2006). Best practices in nurse-midwifery education include didactic teaching of the outcome benefits of continuous labor support, how to perform continuous labor support, and designing clinical experiences for students to implement the specific continuous labor support behaviors. Adams and Bianchi (2008) identify the following curricular content:

- Positioning and movement,
- Use of hot/cold therapy,
- Relaxation techniques using breathing and focus,
- Use of therapeutic touch,
- Verbal support and encouragement,
- Informational support,
- Partner support, and
- Birth environment management.

Adams and Bianchi (2008) discussed the need to teach continuous labor support behaviors as a best practice not only to students but also to practicing midwives. Nurse-midwives working within hospital settings can provide educational in-services to nursing and obstetrical staff on the benefits and methods of continuous labor support for all laboring women. In maternity care practices where continuous labor support is precluded by institutional restraints, nurse-midwives can assist pregnant women in finding doula services and supporting agencies that will provide funding for them. Some insurance companies now offer full or partial payment for doula services. Educating hospital administrators, obstetricians, childbirth educators, pregnant women, and other stakeholders on the multiple maternal outcomes afforded by continuous labor support can lead to collaborative efforts toward changing institutional practice. There is a growing movement for more humane and evidence-based childbirth care within the health care system and the public via groups like Childbirth Connection, Lamaze International, Coalition for Improving Maternity Services, and BirthNetwork National. A best practice for nurse midwives is to join and provide a voice for these efforts.

Women worldwide share a common need and desire for continuous therapeutic support in labor (Campero et al., 1998; Mahdi & Habib, 2010; Price,

Noseworthy, & Thornton, 2007). Continuous therapeutic labor support promotes improved maternal and fetal health outcomes without risk and should be provided as a routine for all laboring women. One of the 16 hallmarks of the nurse-midwifery profession is the value of therapeutic presence in providing health care to women. Nurse-midwives are ideal leaders in educating nurses, obstetrical teams, and childbearing women on the benefits and implementation of continuous labor support for all women as a routine intervention in all birth settings.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 4.1

Therapeutic Presence and Continuous Labor Support: Using the Evidence

Leigh and Gail, nurse-midwives, joined a four-physician practice 2 years ago. They have their own caseload, attending about 20 births per month in the local 400-bed regional referral hospital. Women in the community are signing up for nurse-midwifery services in larger numbers. The physicians are asking that they take on more clients; however, they remain dedicated to providing labor support. In an effort to bring their physician colleagues to a better understanding of their practice scheduling, Leigh and Gail presented the evidence on the outcome benefits of continuous labor support during a monthly staff meeting.

This presentation prompted discussion on outcome markers and strategies to allow physician group clients to benefit from this support. A subcommittee of one nurse-midwife, one MD, and one RN from the labor and birth unit was formed to gather evidence and ideas to bring back to the group. The subcommittee recommendations included using privately hired doulas, enlisting the support of the director of the school of nursing who subsequently agreed to integrate labor support behaviors in the didactic and clinical maternity nursing courses. All students had to function as a doula twice: once alongside a mentor RN or with one of the nurse-midwives, and again with RN supervision for a physician group client.

Leigh and the unit RN presented an in-service to the labor and birth unit nursing staff on the benefits of continuous labor support. Gail, one of the physicians, and the hospital childbirth education director met with a local doula to discuss doula services, costs, and availability. It was decided that doulas would teach one of the childbirth education classes covering support in labor. Informational brochures about doula services would be provided during the class as well as at the nurse-midwife and physician offices.

Before this project began, the nurse-midwives and physicians decided to track select outcomes pre- and post-labor support intervention. Initial changes included nurses providing one-to-one labor support, when staffing allowed, and nursing students acting as doulas.

(continued)

CASE STUDY *(continued)*

Exemplar of Best Practice

In reviewing outcome markers at the 8-month period, data indicated that, for the physician group clients, 101 of 249 women received continuous labor support from a nurse, doula, or nursing student. Operative birth decreased by 8% to 19%, oxytocin use decreased by 10% to 17%, and client satisfaction with their birth experience increased by 34%.

Hospital administration was impressed by the efforts of the nurse-midwife and physician groups to improve outcomes. They noted a concomitant decrease in hospital length of stay, likely related to the decrease in operative birth. At this point, they became more involved in efforts to provide one-to-one care in the labor and birth unit, and began actively working with the nursing department to examine staffing patterns. Hospital administrators also used funds from the childbirth education department to pay for doula services for women unable to afford the cost. Efforts are ongoing to enlist the involvement of all nurses on the unit to provide continuous labor support and to orient new nurses to labor support behaviors.

REFERENCES

Adams, E. D., & Bianchi, A. L. (2008). A practical approach to labor support. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *37*(1), 106–115.

American College of Nurse-Midwives. (2007). *Hallmarks of midwifery care. Core competencies for basic midwifery practice*. Retrieved from http://www.acnm.org/siteFiles/descriptive/Core_Competencies__6_07.pdf

Ayers, S., & Ford, E. (2009). Birth trauma: Widening our knowledge of postnatal mental health. *The European Health Psychologist*, *11*(2), 16–19.

Barrett, S. J., & Stark, M. (2010). Factors associated with labor support behaviors of nurses. *The Journal of Perinatal Education*, *19*(1), 12–18.

Bartz, J. A., & Hollander, E. (2008). Oxytocin and experimental therapeutics in autism spectrum disorder. *Progress in Brain Research*, *170*(8), 451–462.

Bryanton, J., Gagnon, A. J., Johnston, C., & Hatem, M. (2008). Predictors of women's perceptions of the childbirth experience. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *37*(1), 24–34.

Buckley, S. (2003). Undisturbed birth: Nature's blueprint for ease and ecstasy. *Journal of Prenatal and Perinatal Psychology and Health*, *17*(4), 261–288.

Campbell, D. A., Lake, M. F., Falk, M., & Backstrand, J. R. (2006). A randomized control trial of continuous support in labor by a doula. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *35*(4), 456–464.

Campero, L., Garcia, C., Duaz, C., Ortiz, O., Reynoso, S., & Langer, A. (1998). "Alone, I wouldn't have known what to do": A qualitative study on social support during labor and delivery in Mexico. *Social Science & Medicine*, *47*(3), 395–403.

Coalition for Improving Maternity Care Services, Expert Work Group. (2007). Evidence basis for the ten steps of mother-friendly care. *Journal of Perinatal Education*, *16*(Suppl. 1).

Folkman, S., & Lazarus, R. S. (1988). The relationship between coping and emotion: Implications for theory and research. *Social Science & Medicine*, *26*(3), 309–317.

Forbes, M. O., & Hickey, M. T. (2009). Curriculum reform in baccalaureate nursing education: Review of the literature. *International Journal of Nursing Education Scholarship*, *6*(1).

Ford, E., & Ayers, S. (2008). Stressful events and support during birth: The effect on anxiety, mood and perceived control. *Journal of Anxiety Disorders*, *23*(2), 260–268.

Ford, E., Ayers, S., & Wright, D. B. (2009). Measurement of maternal perception of support and control in birth (SCIB). *Journal of Women's Health*, *18*(2), 245–252. doi:10.1089/jwh.2008.0882

Graham, I. D., Logan, J., Davies, B., & Nimrod, C. (2004). Changing the use of electronic fetal monitoring and labor support: A case study of barriers and facilitators. *Birth*, *31*(4), 293–301.

Gutkowska, J., Jankowski, M., Mukaddem-Daher, S., & McCann, S. M. (2000). Oxytocin is a cardiovascular hormone. *Brazilian Journal of Medical and Biological Research*, *33*(6), 625–633. doi:10.1590/S0100-879X2000000600002

Harvey, S., Rach, D., Stainton, C., Jarrell, J., & Brant, R. (2002). Evaluation of satisfaction with midwifery care. *Midwifery*, *18*(4), 260–267.

Hayes, T. (2010). Labour and birth: Self control and the laboring woman. *MIDIRS Midwifery Digest*, *20*(3), 335–341.

Heinrichs, M., von Dawans, B., & Domes, G. (2009). Oxytocin, vasopressin, and human social behavior. *Frontiers in Neuroendocrinology*, *30*(4), 548–557.

Hodnett, E. D. (2002). Pain and women's satisfaction with the experience of childbirth: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(5 Suppl. Nature), S160–S172.

Hodnett, E. D., Gates, S., Hofmeyr, G. J., Sakala C., & Weston, J. (2011). Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews*, (2), CD003766. doi:10.1002/14651858

Kennedy, H. P. (2000). A model of exemplary midwifery practice: Results of a Delphi study. *Journal of Midwifery & Women's Health*, *45*(1), 4–19.

Kennell, J., Klaus, M., McGrath, S., Robertson, S., & Hinkley, C. (1991). Continuous emotional support during labor is a U.S. hospital. *Journal of the American Medical Association*, *265*(17), 2197–2201.

Klaus, M., Kennell, J., Berkowitz, G., & Klaus, P. (1992). Maternal assistance and support in labor: Father, nurse, midwife, or doula? *Clinical Consultations in Obstetrics and Gynecology*, *4*(4), 211–217.

Lamaze International. (2007). *The six care practices that support normal birth*. Retrieved from http://www.lamaze.org/LinkClick.aspx?fileticket=FuucOJ91Tvw%3D&tabid=108&mid=556

Lange, G., & Kennedy, H. P. (2006). Student perceptions of ideal and actual midwifery practice. *Journal of Midwifery & Women's Health*, *51*(2), 71–77.

Leap, N., Sandall, J., Buckland, S., & Huber, U. (2010). Journey to confidence: Women's experiences of pain in labour and relational continuity of care. *Journal of Midwifery & Women's Health*, *55*(3), 234–242.

Lederman, R. P., Lederman, E., Work, B. A., Jr., & McCann, D. S. (1981). The relationship of maternal prenatal development to progress in labor and fetal-newborn health. *American Journal of Obstetrics & Gynecology*, *139*(8), 956–958.

Lehrman, E. (1988). A theoretical framework for nurse-midwifery practice. *Dissertation Abstracts International*, 49–173:5230. (UMI No. 8905798)

Mahdi, S. S., & Habib, O. S. (2010). A study on preferences and practices of women regarding place of delivery. *Eastern Mediterranean Health Journal*, *16*(8), 874–878.

Martin, E. (2001). *The woman in the body: A cultural analysis of reproduction*. Boston, MA: Beacon Press.

McCourt, C. (Ed.). (2009). *Childbirth, midwifery and concepts of time*. New York, NY: Berghahn Books.

McGrath, S. K., & Kennell, J. H. (2008). A randomized controlled trial of continuous labor support for middle class couples: Effect on cesarean delivery rates. *Birth*, *35*(2), 92–97.

Mooney, M. (2007). Professional socialization: The key to survival as a newly qualified nurse. *International Journal of Nursing Practice*, *13*(2), 75–80.

Nilsson, C., Bondas, T., & Lundgren, I. (2010). Previous birth experience in women with intense fear of childbirth. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *39*(3), 290–309.

Page, L., & McCandlish, R. (2006). *The new midwifery; Science and sensibility in practice*. (2nd ed.). Philadelphia, PA: Churchill Livingstone.

Pascali-Bonaro, D., & Kroeger, M. (2004). Continuous female companion during childbirth: A crucial resources in times of stress or calm. *Journal of Midwifery & Women's Health*, *49*(4 Suppl. 1), 19–27.

Payant, L., Davies, B., Graham, I. D., Peterson, W. E., & Clinch, J. (2008). Nurses' intentions to provide continuous labor support to women. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *37*(4), 405–414.

Price, S., Noseworthy, J., & Thornton, J. (2007). Women's experience with social presence during childbirth. *The American Journal of Maternal Child Nursing*, *32*(3), 184–191.

Romano, A. M., & Lothian, J. A. (2008). Promoting, protecting, and supporting normal birth: A look at the evidence. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *37*(1), 94–104.

Rooks, J. P. (1999). The midwifery model of care. *Journal of Nurse-Midwifery*, *44*(4), 370–374.

Sakala, C., & Corry, M. (2008). *Evidence–based maternity care: What it is and what it can achieve*. Retrieved from http://www.milbank.org/reports/0809MaternityCare/0809MaternityCare.html

Sauls, D. J. (2004). Adolescents' perception of support during labor. *Journal of Perinatal Education*, *13*(4), 36–42.

Sauls, D. J. (2006). Dimensions of professional labor support for intrapartum practice. *Journal of Nursing Scholarship*, *38*(1), 36–41.

Schaeffer, C., Coyne, J. C., & Lazarus, R. S. (1981). The health-related functions of social support. *Journal of Behavioral Medicine*, *4*(4), 381–406.

Schuiling, K. D., & Sampselle, C. M. (1999). Comfort in labor and midwifery art. *The Journal of Nursing Scholarship*, *31*(1), 77–81.

Scott, K. D., Klaus, P. H., & Klaus, M. H. (1999). The obstetrical and postpartum benefits of continuous support during childbirth. *Journal of Women's Health & Gender-Based Medicine*, *8*(10), 1257–1264.

Sharkey, J. T., Puttaramu, R., Word, R. A., & Olcese, J. (2009). Melatonin synergizes with oxytocin to enhance contractility of human myometrial smooth muscle cells. *Journal of Clinical Endocrinology and Metabolism*, *94*(2), 421–427.

Sleutel, M., Schultz, S., & Wyble, K. (2007). Nurses' views of factors that help and hinder their intrapartum care. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *36*(3), 203–211.

Simkin, P. (1992). Just another day in a woman's life? Part II: Nature and consistency of women's long-term memories of their first birth experiences. *Birth*, *19*(2), 64–81.

Simkin, P., & Ancheta, R. (2010). *Labor progress handbook: Early interventions to prevent and treat dystocia*. (3rd ed.). Boston, MA: Wiley-Blackwell.

Simkin, P., & O'Hara, M. (2002). Nonpharmacologic relief of pain during labor: Systematic reviews of five methods. *American Journal of Obstetrics and Gynecology*, *186*(5 Suppl. Nature), S131–S159.

Simpson, K. R. (2010). Reconsideration of the cost of convenience: Quality, operational, and fiscal strategies to minimize elective labor induction. *Journal of Perinatal & Neonatal Nursing*, *24*(1), 43–52.

Srisuthisak, S. (2009). *Relationships among stress of labor, support and experience of childbirth in postpartum mothers*. Unpublished doctoral dissertation, Virginia Commonwealth University—Richmond, VA. Retrieved from http://hdl.handle.net/10156/2631

Taylor, S. (1979). Hospital patient behavior: Reactance, helplessness or control? *Journal of Social Issues*, *35*(1), 156–184.

Waldenström, U. (2004). Why do some women change their opinion about childbirth over time? *Birth*, *31*(2), 102–107.

Wiklund, I., Edman, G., Larsson, C., & Andolf, E. (2009). First-time mothers and changes in personality in relation to mode of delivery. *Journal of Advanced Nursing*, *65*(8), 1636–1644.

Wolf, J. H. (2009). *Deliver me from pain: Anesthesia & birth in America*. Baltimore, MD: The John Hopkins University Press.

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Home Birth: Evidence and Controversy

5

Suzan Ulrich and Tonya B. Nicholson

THE PLACE OF BIRTH

The place of birth is a highly charged issue. Less than 1% of women in the United States choose to give birth outside the hospital (MacDorman, Menacker, & Declercq, 2010). In the United Kingdom, the Royal College of Obstetricians and Gynaecologists openly supports home birth; the rate of women practicing home birth in the United Kingdom is about 2%. It is speculated that this rate in the United Kingdom would be 8% to 10% if women were given more choice (Royal College of Obstetricians and Gynaecologists & Royal College of Midwives, 2005). Although supported by public policy in the United Kingdom, home birth is not selected by the majority of women (Malloy, 2010).

Advocates for home birth must prove it is as safe as birth within the hospital. This is ironic because moving birth into the hospital was an experiment with no evidence to support the movement of low-risk women into the hospital setting and much evidence to suggest that it was less safe than birth at home (Leavitt, 1986). This massive shift of birthing women to hospitals with no evidence and no randomized trials earned the field of obstetrics the *wooden spoon* award from Archie Cochrane (Enkin, 2006). In 1971, Cochrane lamented the move of all births to the hospital setting as well as the introduction of interventions without evaluation of benefit (Enkin, 2006).

The Transition in Birth Setting

Home was the birth setting for millennia until the advent of modern obstetrics around 1900. Only 5% of American women gave birth in a hospital in 1900, and these women were typically indigent. This percentage increased to 50% by 1939 as 75% of urban women had hospital births. By 1960, virtually all births occurred in hospitals (Wertz & Wertz, 1979). The move to the hospital as the setting for birth paralleled the rise in obstetrical specialists using medications and instruments

to assist with birth. The hospital was seen as a place that provided more safety and pain relief. It also gave women respite from household chores in the puerperal period, previously done by women friends and the family but not as available in the industrial age (Leavitt, 1986; Wertz & Wertz, 1979). Obstetricians and women desired hospital births but for different reasons.

Hospital birth in the 1920s and 1930s was not safer than home birth. The White House Conference on Child Health and Protection reported that maternal mortality did not decline between 1915 and 1930 even though hospital births had increased substantially. Infant mortality from injuries sustained in operative births increased by 40% to 50% (Wertz & Wertz, 1979). Even the prominent obstetrician, Dr. Joseph DeLee, decried the increase in maternal morbidity and mortality associated with increasing numbers of hospital births. He stated home birth was safer than hospital birth. His solution was not to return to the home birth setting but to improve the vigilance against infection in hospitals. Some physicians advised low-risk women to give birth at home (Leavitt, 1986).

The advent of antibiotics and blood transfusions in the late 1930s decreased maternal mortality significantly. Using cesarean section in place of high forceps resulted in less maternal morbidity and mortality. Physicians generally considered birth as a pathological process, thereby justifying and institutionalizing many obstetrical interventions. Women were seeking hospital birth for perceived safety, pain relief, and time for lying-in (Wertz & Wertz, 1979). For women, the cost of moving birth to the hospital was loss of personal control, submission to the authority of the specialist, and separation from their support systems (Leavitt, 1986).

The natural childbirth movement began as American women became dissatisfied with hospital birth where they were not in control and often not awake. They looked to Europe, where women were giving birth without so much intervention. Dr. Grantly Dick-Read proposed that fear increased pain in childbirth, a concept embraced by many American women. Also, American women wanted to experience birth with their families (Wertz & Wertz, 1979). The movement for natural birth coincided with the feminist movement as well as general anti-establishment consciousness, resulting in a resurgence of births outside the hospital and consumer demand for natural, family-centered births in the hospital.

Out-of-hospital births have accounted for about 1% of births in the United States since 1969 (MacDorman et al., 2010). Recently, the National Center for Health Statistics indicated out-of-hospital births increased by 0.03% from 0.87% in 2004 to 0.90% of American births in 2005 and 2006. This is the first increase since out-of-hospital births slowly declined from slightly more than 1% in 1990 to 0.87% in 2004. Home births accounted for almost 65% of the out-of-hospital births in 2006, whereas freestanding birth centers accounted for 28%. This is a decline in the percentage of births in freestanding birth centers and an increase in the percentage of home births since 1990 (MacDorman et al., 2010).

The reason for this increase in out-of-hospital births may be related to concern about cesarean section. In the United States, almost one third of childbearing women now give birth through operative birth (Menacker & Hamilton, 2010). A qualitative study by Boucher, Bennett, McFarlin, and Freeze (2009) found that the top five reasons for selecting home birth as stated by at least 30% of the women

were safety, lack of interventions, previous negative experience with hospital birth, control, and comfortable setting. Twenty-five percent of the women studied also said they trusted the birth process (Boucher et al., 2009).

The media has recently popularized home birth with celebrity endorsements, including the writings and media presentation by Lake and Epstein (2009). The effects of media attention on women's choice of birthplace are difficult to measure. According to Lake and Epstein, the American Medical Association "issued a resolution against home birth that singled out Ricki Lake for sharing her experience" (p. 59). The controversy about home birth makes it difficult for women to evaluate their options (Keirse, 2010; Olsen & Jewell, 1998).

Planned Home Birth

In the United States, home birth elicits strong reactions positively and negatively. Dependence on the hospital for women who are experiencing low-risk pregnancies results in increased intervention and adverse outcomes (Hodnett, Walsh, & Weston, 2010). Many women have had negative experiences of technological birth, especially when it was not needed (Hodnett et al., 2010; Kitzinger, 2006). The midwifery model of care supports that women should have the opportunity to examine their options with a balanced presentation of the evidence (American College of Nurse-Midwives [ACNM], 2003).

HOME BIRTH: THE EVIDENCE

Studying the safety of birth setting poses many methodological issues. Randomized controlled trials (RCTs) are the gold standard for evidence-based practice (Gyte et al., 2009). Studies of the safety of place of birth must have large numbers because adverse events in childbirth are relatively uncommon (Gyte et al., 2009). Further, it is essential that out-of-hospital births, such as freestanding birth center or planned home births, be clearly differentiated from unplanned home or unexpected community-based births (such as in a car en route to care). It is well established that unplanned and often unattended births have a higher incidence of poor outcomes (Gyte et al., 2009; Olsen, 1997). If a home birth is planned when the woman enters prenatal care, any complications that develop prior to labor (for example, preterm labor or hypertension) confound the results. Only women who have no identified risk factors at the onset of labor should be included in evaluating the safety of planned home birth, or the confounders should be identified in the study (Gyte et al., 2009). Some experts believe that questions concerning place of birth are so complex and the outcomes are so multifactorial that the research leaves more questions than answers (Enkin, 2006; Walsh, 2007).

Cohort Studies on Home Birth

Cohort studies observe the outcomes of various groups over time to determine the effects of interventions or treatments. Often, cohort studies control for variables known to influence the outcome, either by matching the groups or by applying

different treatments. This chapter will examine cohort studies that provide good evidence about the safety of planned home birth for women at low risk and cohort studies with serious methodological flaws.

Methodologically Sound Cohort Studies Supporting Safety of Home Birth

A national study of home births in the Netherlands (n = 529,688) had sufficient statistical power to predict adverse birth outcomes, generally uncommon events (De Jonge et al., 2009). In the Netherlands, 30% of women give birth at home. The maternity system is designed at two levels. At the primary level, women at low risk are cared for by midwives and have the option to give birth at home or in the hospital. The secondary level includes women with risk factors for pregnancy and birth complications who are cared for by obstetricians with births in the hospital. The system allows seamless referral of women to a secondary level of care when indicated. Comprehensive data on maternity care are recorded in the Netherlands Perinatal Registry (De Jonge et al., 2009).

Women in the primary midwifery-led level of care at the time of labor initiation and those who gave birth between January 1, 2000 and December 21, 2006 were included in this analysis. The study included those women who gave birth between 37 and 41 weeks' gestation to one fetus in the cephalic presentation. Data were analyzed based on intended place of birth: home, hospital, or unspecified. Outcome measures included neonatal death during the intrapartal period up to 7 days of age as well as admission to the neonatal intensive care unit (NICU). Confounding variables (e.g., maternal age, gestational age, parity, ethnicity, socioeconomic status) were analyzed according to place of birth. Multiple logistic regression was used to determine the effects of each confounder (De Jonge et al., 2009).

This study found that women planning a home birth were more likely to be older than age 25, multiparous, of Dutch origin, have higher incomes, and on average gave birth at 41 weeks. They were least likely to give birth at 37 weeks' gestation. There was no significant difference in the relative risk of perinatal mortality between the three groups. Higher risk of mortality was associated with primiparous women, those who gave birth at gestational extremes (<37 or >41 weeks' gestation), or were 35 years of age or older. Study participants who were not Dutch in origin had an increased relative risk for perinatal mortality. Babies born to mothers with an undetermined place of birth had increased risk of being admitted to the NICU. Admission to the NICU was elevated for primiparous women who gave birth at gestational extremes (<37 or >41 weeks' gestation), were 35 years of age or older, of non-Dutch origin, and with lower incomes (De Jonge et al., 2009).

The authors concluded that a planned home birth "does not increase the risk of perinatal mortality among low risk women, provided the maternity care system facilitates this choice through the availability of well-trained midwives and through a good transportation and referral system" (De Jonge et al., 2009, p. 1177). Limitations of the study include the retrospective design and the lack of recoding of intended place of birth for 8.5% of the sample (De Jonge et al., 2009). This

study provides evidence for the maternity care model in the Netherlands, which is designed to support women with low-risk pregnancies who choose home birth.

A cohort study ($n \geq 12{,}000$) by Janssen, Saxell et al., (2009)—conducted between January 1, 2000 and December 31, 2004—used the Perinatal Database Registry of British Columbia, Canada, which has a 97% accuracy rate. A unique feature of this study was that both the planned home birth cohort ($n = 2899$) and one of the planned hospital birth cohorts ($n = 4752$) were cared for by the same group of midwives, thus eliminating the confounding variable of care provider. The third cohort ($n = 5331$) was a planned hospital birth cohort attended by physicians. Women who planned to give birth at home were found to have fewer interventions and fewer adverse outcomes but have comparable Apgar scores with the hospital birth cohorts. The rate of perinatal death was less than 1 per 1000 live births (Janssen, Saxell et al., 2009).

All three groups met the eligibility criteria for home births in British Columbia, including no chronic diseases or complications of pregnancy, although two of the groups planned a hospital birth. All labors were spontaneous or with outpatient induction, and the women had singletons in cephalic presentation with a gestational age of 36 to 41 weeks. Women with one previous cesarean section were also included in the study because vaginal birth after cesarean (VBAC) is a standard of care in British Columbia. The data were analyzed using planned place of birth, regardless of where the birth actually occurred (Janssen, Saxell et al., 2009).

The main outcome variable was perinatal death, defined as ". . . stillbirth after 20 weeks' gestation or death in the first seven days of life" (Janssen, Saxell et al., 2009, p. 379). The sample size was adequate to have 92% power to predict perinatal death rates within 3 births per 1000 (95% confidence level). Another outcome variable was the use of obstetric interventions, including electronic fetal monitoring, induction and augmentation of labor, analgesia for labor, episiotomy, assisted operative vaginal birth, and cesarean section. Maternal and newborn complications were also studied (Janssen, Saxell et al., 2009).

The three cohort groups were found to be similar in characteristics, although the women who planned to give birth at home were less likely to be single or primiparous. The perinatal mortality rate was less than 1 per 1000 live births, comparable in all three groups and there were no maternal deaths or neonatal deaths after 7 days of life. The women with planned home birth had fewer interventions and significantly less adverse outcomes. Newborns in the planned home birth group had Apgar scores comparable to the planned hospital birth group neonates and had similar or decreased risk for all newborn complications except admission to the hospital. The authors speculated that this difference was related to hyperbilirubinemia because it is a common reason for admission. The home birth group might show more newborn initial admissions to the hospital because at least 40% of the hyperbilirubinemia cases are identified and treated in hospital-born infants before they are discharged (Janssen, Saxell et al., 2009).

The strengths of this study included the use of the highly accurate national registry of birth data, the same group of midwives caring for women who planned home birth and women who planned a midwife-attended hospital birth. Limitations included inability to measure the home birth environment and possible

unique qualities of women who choose home birth. The authors identified some misclassification of planned place of birth in both of the groups cared for by midwives. Adjusting for this bias by placing all the perinatal deaths in the planned home birth group did not affect the results (Janssen, Saxell et al., 2009).

The authors stated that this study made a significant contribution to the evidence, showing the relative safety of home birth in a system where midwives and home birth are an integral part of maternity services. The rate of 1 perinatal death per 1000 live births was identified as a good benchmark for monitoring the safety of home births (Janssen, Saxell et al., 2009).

Another cohort study of home ($n = 6692$) versus hospital births ($n = 6692$) was conducted in Ontario, Canada from 2003 to 2006 (Hutton, Reitsma, & Kaufman, 2009). This study retrospectively examined Ministry of Health data on births attended by midwives in the home setting with a matched group of women who elected hospital birth. Midwives attend only women at low risk for obstetrical problems and who, therefore, have the option to choose the birth setting.

The study noted the woman's intention for planned home birth or hospital birth at the onset of labor. Some of the cohort sample would not have been at home based on the interventions used. This subset was removed from the initial analysis and was included as part of the home birth group in a secondary analysis. This data manipulation did not significantly change the results. The data was stratified by parity and previous cesarean birth. The women in the two groups were very similar except that women planning home birth were more likely to have had care by a midwife in a previous pregnancy (Hutton et al., 2009).

Outcome measures included neonatal mortality (either stillbirth or neonatal death, except with lethal anomalies) and neonatal complications (including resuscitation with cardiac compressions and the need for admission to the NICU for more than 4 days). Other outcomes included maternal mortality and morbidity, obstetric interventions, and breastfeeding exclusively at 1 and 6 weeks postpartum. The home birth group experienced the same rate of mortality and morbidity as the hospital cohort. The neonatal mortality in this study was 1 death per 1000 live births, and the authors noted this was similar to another home birth study from British Columbia. Babies born at home were more likely to be exclusively breastfed at 1 and 6 weeks postpartum (Hutton et al., 2009).

There were no maternal deaths in the cohorts. Women giving birth at home had fewer obstetrical interventions, including "an absolute decrease of 2.9 percent in the rate of cesarean section" (Hutton et al., 2009, p. 186). There were fewer transfers to an obstetrician from the home birth group than from the planned hospital group. The authors conducted a subgroup analysis of nulliparous versus parous women and found fewer first time mothers choose home birth. They also had a higher rate of ambulance transfer from home to hospital. Nulliparous women in both groups were more likely to have consultation with an obstetrician, augmentation of labor, perineal trauma, blood loss >1000 ml, assisted births, or cesarean births. The planned hospital nulliparous women experienced the same or more obstetric interventions compared to nulliparous women who planned home births, although the neonatal mortality and morbidity rates were the same. The women most likely to be breastfeeding exclusively at 6 weeks postpartum were

multiparous choosing home birth followed by the nulliparous women choosing home birth (Hutton et al., 2009).

This study supports the safety of home birth for low-risk women cared for by midwives in a maternity care system that fosters home birth (Hutton et al., 2009). It used registry data to conduct analysis based on planned place of birth, including secondary analysis of possibly misclassified records. The authors noted that, as midwives in Canada attend home and hospital births, both cohorts had the same care providers practicing in a similar fashion in both settings. The authors speculated that women who chose home birth may have been more interested in unmedicated births with less use of obstetrical interventions. They also posited that the hospital setting itself may have contributed to the 2.9% increase in cesarean births because women lost their trusted provider, the midwife, due to institutional policies requiring transfer of care to an obstetrician (Hutton et al., 2009).

Flawed Cohort Study on the Safety of Home Birth

South Australian researchers examined the differences in outcomes of planned home births versus hospital births from 1991 through 2006 (Kennare, Keirse, Tucker, & Chan, 2009). The study used the perinatal statistics from the Pregnancy Outcome Unit of South Australia Health for 298,333 births, excluding births to mothers who received no prenatal care. The outcome variables were perinatal death, intrapartal death, and death attributed to hypoxia in labor as determined by the Maternal Perinatal and Infant Mortality Committee using the Whitefield classifications. Other outcome measures included Apgar scores less than 7 at 5 minutes and the need for intensive pediatric care of the newborn. Maternal outcomes included operative birth, episiotomy, perineal lacerations, and postpartum hemorrhage (Kennare et al., 2009).

Data were analyzed for predictors of obstetrical outcomes. There were 1141 (0.38%) planned home births, with 792 occurring at home and the remaining 349 transferred to the hospital. The data did not indicate if the transfer was before the labor began or not. However, in the case of perinatal death, the committee review was able to determine this information (Kennare et al., 2009).

The women planning home births were older, of higher socioeconomic status, living in urban areas, multiparous, and more likely to give birth after 42 weeks' gestation. Home births included women with previous cesarean births as well as five sets of twins. The study demonstrated a perinatal death rate of 7.9 per 1000 live births with the planned home birth group as compared to 8.2 per 1000 live births in the planned hospital group (Kennare et al., 2009). Of the nine perinatal deaths in the planned home birth group, two occurred at home and seven occurred after transfer to the hospital (Kennare et al., 2009). One of the two deaths at home was a baby with a suspected anomaly on prior ultrasound. The parents declined additional testing, choosing comfort measures as the only treatment, and the baby subsequently died of congenital anomalies. The other death at home was an intrapartal stillbirth. Two of the seven perinatal deaths transferred to the hospital were to women who were high risk. The first one was postdate with an induction and the baby died of a lethal congenital anomaly. The second one was a twin

pregnancy. The mother refused a hospital birth and had a difficult transfer during labor. The second twin asphyxiated. The other five deaths included three antepartum demises unrelated to prenatal care. The final two deaths involved women who developed complications. One had premature rupture of membranes and the baby died of pulmonary hypoplasia. The other woman refused any interventions, including electronic fetal monitoring, for a pregnancy exceeding 42 weeks' gestation while laboring in the hospital. This infant death was attributed to intrapartal asphyxia. The authors found no significant difference in the rate of perinatal deaths between planned home births and planned hospital births when congenital anomalies were excluded from the analysis (Kennare et al., 2009).

Among infants with low 5-minute Apgar scores and the need for pediatric intervention, there was no difference between the planned home birth group and the planned hospital group. Yet, the authors highlighted the higher rate of low 5-minute Apgar scores among the seven infants in the planned home birth group who ended up being born in the hospital. They also found that planned home birth mothers had fewer operative births and less perineal trauma (Kennare et al., 2009).

In their discussion of the these nine infant deaths among the planned home birth mothers, Kennare et al. (2009) state, "Planned home births had a perinatal mortality rate similar to that of planned hospital births, but had a sevenfold higher risk of intrapartal death and a 27-fold higher risk of death from intrapartal asphyxia" (p. 78). They do not account for the failure in risk screening for these high-risk women with planned home birth nor the ultimate setting of demise for the infants. According to Gyte et al. (2009), in the 16 years of the study, three infant deaths in the planned home birth group could have been prevented by a different choice of provider and birth setting. These deaths occurred in infants whose mothers were high risk and should not have been in the planned home birth setting. An editorial article and a press release accompanying this study in the *Medical Journal of Australia* added fuel to the debate over home birth. It highlighted neonatal deaths due to intrapartal asphyxia without clearly stating that the perinatal mortality rate for planned home births was statistically equivalent to the perinatal mortality rate for hospital births (Bainbridge, 2010; Pesce, 2010; Sweet, 2010). The large confidence intervals and use of odds ratios based on two intrapartal deaths and three deaths related to intrapartal asphyxia were considered inappropriate (Delamothe, 2010).

This retrospective study draws conclusions poorly supported by the data, especially regarding the lack of difference in neonatal outcomes among low-risk home birth mothers and mothers with planned hospital births. The study was limited by lack of data about whether transfer to hospital was prior to labor or during labor. Care providers for home birth were independent midwives not well integrated into the health care delivery system. At that point in time, risk assessment for planned home birth and midwifery education were limited in Canada. The authors concluded that some of the excess neonatal mortality deaths might be traced to these factors. Further, they supported integrating providers of home birth into the health care system so they could provide referral as needed and have support for better risk assessment of women planning to give birth at home (Kennare et al., 2009).

Meta-Analyses on Home Birth

Meta-analysis, comparing multiple studies, is a powerful tool to increase study numbers and to enhance the evidence about the safety of place of birth.

Methodologically Sound Meta-Analyses Supporting Safety of Home Birth

Olsen (1997) conducted a meta-analysis of observational studies. Six controlled observational studies of women with low risk for obstetrical complications were analyzed ($n = 24{,}092$). There was no significant difference in the perinatal mortality rate for home and hospital birth. The rate of low Apgar scores and severe perineal lacerations was significantly lower in the home birth group. In addition, there were more interventions noted in the hospital birth group, including induction of labor, augmentation of labor, episiotomy, and operative and cesarean births. The author concluded, "Home birth is an acceptable alternative to hospital confinement for selected pregnant women, and leads to reduced medical interventions" (Olsen, 1997, p. 4).

Another systematic review of RCTs comparing planned home birth with planned hospital birth was done by Olsen and Jewell (1998). Only one study was found that met the inclusion criteria. It was a small trial to determine if women could be randomized into home and hospital groups for a larger clinical trial. The authors deemed this study to be of "intermediate to high quality evidence" (Olsen & Jewell, 1998, p. 4). Because there were only 11 women in the study, the authors stated that no results could be drawn. One interesting finding was that the majority of the mothers randomized to the hospital birth group expressed disappointment with their birth experience. Further, the authors concluded that the findings of this study were similar to the previous meta-analysis of home births by Olsen (1997) and that there was no evidence determining place of birth for women with low-risk pregnancies (Olsen & Jewell, 1998).

Flawed Meta-Analysis on the Safety of Home Birth

Wax et al. (2010) conducted a meta-analysis of maternal and newborn outcome studies with planned home births. Unfortunately, the study was seriously flawed (Keirse, 2010). This analysis by Wax and colleagues was an *editor's choice* article in the September 2010 issue of the *American Journal of Obstetrics and Gynecology*. The editors commented,

> The report by Wax et al. from the Society for Maternal-Fetal Medicine supports the safety of planned home birth for the mother, but raises serious concerns about increased risks of home birth for the newborn infant. This topic deserves more attention from public health officials at state and national levels. (Garite & Kim, 2010, p. 10A)

It garnered much attention in professional journals, including *The Lancet*, *The Lamp*, *Midwives*, *British Medical Journal*, *British Journal of Midwifery*, and *Birth*.

Some used the article to justify a stance against home births including an editorial in *The Lancet*, stating, "Women have a right to choose how and where to give birth, but they do not have the right to put their baby at risk" (Gyte et al., 2010, p. 303). Others contended the study was seriously defective and should be retracted (Horton, 2010; Zohar & De Vries, 2011). The Royal College of Midwives stated, "A flawed analysis is being used to deter women from choosing midwives and home birth" (Warwick, 2010, p. 11).

The meta-analysis by Wax et al. (2010) reviewed 237 citations published between 1947 and 2008. Of these citations, 190 were excluded and 47 were analyzed in depth. Twelve studies from 1976 through 2008 from eight countries were accepted for meta-analysis. All but one study was a cohort design using either retrospective review or prospective design, some with matched controls. The one randomized trial had an extremely low sample size, whereas the other studies had samples ranging from 387 to 484,563 births. Data collection methods included government registries and databases, birth records, questionnaires, and data collection forms designed for the study.

The results showed less obstetric intervention and fewer maternal complications in planned home births. Newborns born at home were more likely to be more than 42 weeks' gestation, large for gestational age, and in need of more assisted ventilation after birth. They were less likely to be premature or low birth weight. The data on perinatal death rate showed no difference between home and hospital births, but the authors reported a tripling of the neonatal mortality rate in the home birth group. They suggested this excess mortality was related to the lack of obstetrical interventions. They concluded, "Less medical intervention during planned home birth is associated with a tripling of the neonatal mortality rate" (Wax et al., 2010, p. 243).

This statement was highly controversial, as the data on the tripling of neonatal deaths in the home birth setting were from a study of U.S. birth certificate data that did not differentiate between planned and unplanned home births (Keirse, 2010). Yet, Wax et al. (2010) used the term "planned home birth" in their statement (p. 344). This is a serious flaw in the conclusions of the meta-analysis. Another major issue was excluding a study of 10,000 planned home births in the Netherlands from the analysis of neonatal deaths while keeping it in the analysis of perinatal deaths. This resulted in basing the neonatal mortality conclusions on a number too small to have the sufficient statistical power (Mayor, 2010). Another major concern in the analysis was comparing results from countries with very different maternity care systems. For example, the British system has a seamless approach from home birth with trained midwives to hospital transport as needed, whereas the United States has a convoluted, time-delay system that often involves changing health care provider (Mayor, 2010). Other concerns with the meta-analysis by Wax et al. (2010) included the selection criteria used to determine which articles would be used and the age of some studies included. There was no critical review of the similarities and differences among the various studies included in the analysis, and the method of accounting for sample size was not discussed. When studies that included *untrained* home birth providers were removed from the analysis, there

was no increase in neonatal mortality in the home setting (Stockdale, Jokinen, & Macdonald, 2010).

Evidence on Women's Satisfaction With Home Birth

Walsh (2007) describes the experience of childbirth as ". . . a fundamental and formative experience for women and their families" (p. 4). Yet, most of the research on home birth focuses only on morbidity and mortality outcomes while ignoring the women's experiences and satisfaction with the process of labor and birth. In determining best practices, it is important to go beyond the quantitative outcomes and examine the women's experiences (Enkin, 2006). High satisfaction with both planned home births and planned births occurring in freestanding birth centers has been documented (Cunningham, 1993; Green, Coupland, & Kitzinger, 1990; Rijnders et al., 2008; Rooks et al., 1989).

A recent study confirmed that women who achieved a planned home birth were highly positive about their experience (Janssen, Henderson, & Vedam, 2009). The first 500 women who gave birth at home in British Columbia after midwifery-attended home birth was adopted by the province were included in the study. The authors found that these women felt empowered and confident because they received emotional support and their midwives included them in decision making about their care. The women expressed that the home environment was familiar, allowing them to relax and experience natural birth with family involvement (Janssen, Henderson et al., 2009).

In a study of the birth stories from 700 women with planned home births in Sweden, the overarching theme was a sense of control (Lindgren & Erlandsson, 2010). The women expressed that they achieved inner strength by accepting the physical sensations of labor and birth and the physical and emotional support from the care provider. The women experienced birth as ". . . greater than anything else they ever experienced" and resulted in an "overwhelming feeling of power and being empowered" (Lindgren & Erlandsson, 2010, p. 315).

This sense of control and satisfaction was also found in a descriptive study of 671 Swedish women choosing planned home birth compared with 126 Swedish women choosing planned cesarean section without labor (Hildingsson, Rådestad, & Lindgren, 2010). Both options are not accepted components of the maternity care system in Sweden but do occur. Women selecting home births were compared with those planning cesarean sections, adjusting for confounding variables. The results showed that women planning home birth were happier with their level of decision making, felt more encouragement from their midwives, experienced higher sense of control, and had more positive birth experiences (Hildingsson et al., 2010).

A study using the Labour Agentry Scale with a matched cohort measured sense of control during childbirth (Hodnett & Simmons-Tropea, 1987). Women planning a home birth with a midwife were compared with women planning a hospital birth with a midwife. Both groups had high levels of satisfaction and a sense of control, but there was a statistically significant higher level of satisfaction and sense of control among the home birth group ($p < .001$). The women with planned home births used the following words to describe their experiences: competent, responsible, secure,

adequate, relaxed, and victorious, whereas those women with planned hospital births more often described their experiences using words such as powerless, awkward, incapable, fearful confined, and anxious (Hodnett & Simmons-Tropea, 1987, p. 93).

Cluster analysis was conducted, consisting of women who scored high for control in labor. Fifty-seven percent of the planned home birth women had a high score for control in labor compared to 33.3% of the women with planned hospital birth. Another cluster examined women who scored low on all items, thus indicating a low sense of control in labor. Among the planned home birth women, 23.1% indicated low sense of control in labor compared to 36% of the planned hospital group. When the intended place of birth was actually the place where the birth occurred, women with home births scored the highest on the Labour Agentry Scale and statistically higher than women who planned and received a hospital birth (Hodnett & Simmons-Tropea, 1987).

BEST PRACTICES IN SELECTING THE PLACE OF BIRTH

Policies Supporting Birth Setting Selection

Women value having choice of birth setting (Janssen, Carty, & Reime, 2006), and there is substantial evidence for the safety of planned home birth among women with low-risk pregnancies, providing that the health care system provides for consultation, referral, and transport as needed (Olsen & Jewell, 1998). Benefits of home births have also been documented (Hodnett & Simmons-Tropea, 1987; Janssen, Henderson et al., 2009; Lindgren & Erlandsson, 2010). "Home and hospital birth are sufficiently safe for safety no longer to be of overriding importance" (Olsen & Jewell, 1998, p. 5). However, policy in supporting choice of birth settings varies widely across nations. The World Health Organization (WHO) supports out-of-hospital birth as a safe practice for low-risk women:

> For a low-risk pregnant woman this can be at home, at a small maternity clinic or birth centre in town or perhaps at the maternity unit of a larger hospital. However, it must be a place where all the attention and care are focused on her needs and safety, as close to home and her own culture as possible. If birth does take place at home or in a small peripheral birth centre, contingency plans for access to a properly-staffed referral centre should form part of the antenatal preparations. (WHO, p. 12)

In the United States, informed choice of birth setting is limited and home birth is marginalized (Walsh, 2007). However, other developed countries have been in alignment with the WHO position. For example, the Royal College of Obstetricians and Gynaecologists and the Royal College of Midwives (2007) issued a joint opinion statement supporting home birth for low-risk women,

> There is no reason why home birth should not be offered to women at low risk of complications and it may confer considerable benefits for them and their families. There is ample evidence showing that labouring at home increases a woman's likelihood of a birth that is both satisfying and safe, with implications for her health and that of her baby. (p. 1)

The Society of Obstetricians and Gynaecologists of Canada (SOGC) has not issued an official position on home birth for Canadian women. However, it did issue a policy statement supporting the return of birth to rural and Aboriginal communities, rather than transferring all rural and Aboriginal women, regardless of level of risk, at 36 weeks' gestation to a referral hospital away from the community. This statement recognizes the importance of women's choice and family unity around births occurring in remote communities. The SOGC (2010) notes, "Programs in Canada and Australia have shown that women with low-risk pregnancies can safely give birth in remote communities without immediate surgical back-up" (p. 1187). The province of British Columbia requires all midwives to explain the options and offer the choice of hospital, freestanding birth center, or home as the birth setting. In British Columbia, around 22% of women choose home birth (Janssen et al., 2006).

The ACNM (2003) has guidelines supporting planned home birth, which include identifying the risk level of the pregnancy, the qualifications of the provider, and a system with adequate support for referral and transport as needed. Further, the ACNM has issued a position paper calling for third-party reimbursement for home birth, professional liability coverage for providers who attend home births, the development of an improved system of referral, and further research on planned home birth that examines maternal–neonatal outcomes and maternal satisfaction (ACNM, 2011b).

The American College of Obstetricians and Gynecologists (ACOG, 2011) issued a statement committing to partnership with clients in the document entitled "Committee Opinion No. 476: Planned Home Birth." This opinion statement supports clients' rights for partnership in care and decision making and states that ACOG ". . . respects the right of a woman to make a medically informed decision about delivery" (p. 427). It is a softening of the earlier policy opposing home births (ACOG, 2006). Nonetheless, the ACOG continues to posit that there is insufficient evidence for planned home birth in the United States, purporting that hospitals or freestanding birth centers are the safest birth setting. Further, the ACOG states that women need to be educated about the ACOG's opinion of perceived increased risks associated with home birth (ACOG, 2011). The document calls for a supportive health care system that includes qualified midwives and physicians (ACOG, 2011). The ACNM responded to the 2011 opinion statement with guarded enthusiasm. The respect for women's choice was applauded, and the possibility for collaborative work was recognized (ACNM, 2011a).

Shortly after the statement by ACOG and the response from ACNM, the two groups issued a *Joint Statement of Practice Relations between Obstetricians-Gynecologists and Certified Nurse Midwives/Certified Midwives* (College Executive Board, 2011). While acknowledging the difference in opinion over home birth, this statement is a positive step toward change, laying the groundwork for best practices. It highlights common ground in supporting women's choices in health care and a mutual goal of providing seamless care to childbearing women in the United States (College Executive Board, 2011).

Exemplar of Best Practices: The Canadian Model

Canada offers a successful model of care that promotes best practices. The practice of nurse-midwifery in Canada, built on the midwifery model of care, is monitored and regulated under provincial and territorial legislation. Midwives practice as autonomous care providers and have access to appropriate consultation and referral within the health care system (College of Midwives of British Columbia, 1996). There is provision to practice across specified territorial borders (Royal College of Obstetricians and Gynaecologists and Royal College of Midwives, 2005). One of the core components in the Canadian model is informed choice. This partnership includes choices about pain management and genetic testing options (Janssen et al., 2006). Since 1998, midwives in British Columbia are legally required to offer choice of birth setting: hospital, freestanding birth center, or home. Midwifery care is fiscally covered by the Ministry of Health and must be available to all clinically appropriate women (Janssen, Saxell et al., 2009).

Implementing Best Practices in the United States

A critical issue for U.S. nurse-midwives is promoting viable options in selecting the place of birth for low-risk women. The United States lacks a national health care plan with established policies and priorities. The practice of obstetrics in the United States uses high levels of intervention and spends more money on maternity services than other developed countries, yet the outcomes are poor (Sakala & Corry, 2008). Amnesty International USA (AIUSA, 2010), in *Deadly Delivery: The Maternal Health Care Crisis in the United States*, states, "Women in the USA have a greater lifetime risk of dying of pregnancy-related complications than women in 40 other countries" (p. 1).

One approach aimed at improving this situation was the Transforming Maternity Care Symposium held in Washington, DC in 2009. The purpose of this national symposium was to develop a blueprint for change in practices of maternity care in the United States (Transforming Maternity Care Symposium Steering Committee, 2009). The symposium brought together diverse stakeholders, including policy makers, advocates, health care financers, program administrators, clinicians, educators, researchers, and quality experts. The stakeholders included persons representing the option of out-of-hospital care (Transforming Maternity Care Symposium Steering Committee, 2009), basing their work on the 2020 Vision for High-Quality, High-Value Maternity Care System (Sakala & Corry, 2008). The major recommendations of the symposium included developing family-centered maternity care homes (a medical home concept), standards for appropriate care based on defined risk factors, good coordination of services, promotion of physiological childbirth, decreased use of unwarranted interventions, and financial support through insurance payment and reforms ensuring access to various maternity care options. Consumer choice was highlighted. Other recommendations included measuring quality, changing payment structure, eliminating access disparities, and reforming the liability system, all essential to promoting out-of-hospital birth (Transforming Maternity Care Symposium Steering Committee, 2009).

The maternity workforce also was addressed in this report, recommending that attention should be paid to aligning the workforce to the goals of high-quality maternity services including increasing the number of skilled midwives to provide primary maternity care (Transforming Maternity Care Symposium Steering Committee, 2009). The United States needs more maternity care providers who are experts in physiological birth and competent in providing out-of-hospital care (Walsh, 2007). Most nurse-midwives in the United States are educated in hospitals with little access to experiencing home birth.

Vedam, Stoll, White, Aaker, and Schummers (2009) conducted a study to investigate nurse-midwives' attitudes and experience with home birth. Ninety-two percent had attended hospital births, whereas 74% had never attended a birth in the home. Only 5% of practicing nurse-midwives were currently attending home births. Among those who were not attending home births, 57% were unwilling or ambivalent about offering this service to their clients. The authors found that exposure to home birth was related to higher scores on the Provider Attitudes towards Planned Home Birth scale (Vedam et al., 2009). For U.S. nurse-midwives to offer women the option of home birth, they need to have experience in home birth settings.

Expanding the nurse-midwifery workforce through increased opportunities for education is essential to increasing the option for home birth. Expanding the workforce is a strategic goal of ACNM (2009) but can only be accomplished if nurse-midwives encourage nurses in the study of nurse-midwifery (Ulrich, 2004). Nurse-midwives need to commit to being preceptors and mentors for students. Education programs need to include content and experience on out-of-hospital birth. This is crucial for improving access to out-of-hospital birth (Vedam et al., 2009).

The choice of birthplace within a system that allows for adequate client selection, informed choice, and seamless care will result in excellent outcomes and increased maternal satisfaction with the birth experience. This is best practice supported by the evidence and amenable to change.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 5.1

Home Birth in the Canadian Health Care System

Jane, a 31-year-old primigravida, had her initial prenatal visit at 7 weeks 2 days with her preferred nurse-midwife, Sarah. Jane was sure of her last menstrual period (LMP), and she had no significant health problems. She was thrilled with the idea of a baby. She and the baby's father have a 6-year relationship and plan to marry soon. They live in the Canadian province of British Columbia.

Sarah performed a physical exam. Her findings were consistent with Jane's report of her LMP. Because Jane was low risk, Sarah determined that Jane was a good candidate to choose any site for birth. They discussed choice of birthplace.

(continued)

CASE STUDY *(continued)*

Jane was interested in home birth but unsure if it is safe. Sarah discussed the risks and benefits of birth at home, in a birthing center, and in a hospital. Jane and her partner decided to plan a home birth.

Jane's pregnancy progressed without complications. During her pregnancy, the midwife did a home visit. She instructed the couple on supplies needed for birth, when to call the midwife, and the plan for transfer to the hospital if needed. Jane and her partner grew in confidence and excitement about the birth. They considered Sarah a friend.

At term, Jane awakened with mild cramping progressing to contractions. At 3 p.m., Jane's partner called Sarah, who arrived, finding Jane in her bathtub, clearly uncomfortable but breathing through contractions. Sarah examined her, determining she was 6 cm and coping well with labor. Her partner was supportive and her family arrived at the house.

Around 10 p.m., a new sound joined the hushed whispers of awe in the bedroom . . . the sound of a mewling baby. Baby Seth was born into the loving hands of his father as Sarah guided and supported. Jane describes this day as the most difficult, daring, and delightful day of her life. She has become a mother while surrounded by her family in her own home. This home, her haven in the past, became a testimony to her strength.

Later, reflecting on this experience, she said, "I felt like I could do my own thing" . . . "Everything and everyone I love surrounded me" . . . "I knew that if I could do this, I could do anything."

Exemplar of Best Practice

Because Jane was guided to trust her own body and her choice of birthplace, she found power and strength through her birth experience. Her confidence in her body and in her ability to make wise decisions for her family was nurtured.

REFERENCES

American College of Nurse-Midwives. (2003). Criteria for provision of home birth services. 2003. *Journal of Midwifery & Women's Health*, *48*(4), 299–301.

American College of Nurse-Midwives. (2009). *ACNM future focus*. Retrieved from http://www.midwife.org/ACNM-Future-Focus

American College of Nurse-Midwives. (2011a). *Issue brief: ACOG committe opinion on planned home birth: Opening the door to collaborative care*. Retrieved from http://www.internationalmidwives.org/Portals/5/2011/ACNM%20ISSUE%20BRIEF.pdf

American College of Nurse-Midwives. (2011b). *Position statement: Home birth*. Retrieved from http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000000251/Home%20Birth%20Aug%202011.pdf

American College of Obstetricians and Gynecologists. (2006). *ACOG statement of policy: Out-of-hospital births is the United States*. Washington, DC: Author.

American College of Obstetricians and Gynecologists. (2011). ACOG Committee opinion no. 476: Planned home birth. *Obstetrics and Gynecology*, *117*(2 Pt. 1), 425–428.

Amnesty International USA. (2010). *Deadly delivery: The maternity health care crisis in the United States*. Retrieved from http://www.amnesty.org/en/library/asset/AMR51/007/2010/en/926e361c-4941-45c5-9368-ab18859254fd/amr510072010en.pdf

Bainbridge, J. (2010). Australian researchers claim home birth increases risk of babies dying. *British Journal of Midwifery*, *18*(2), 111.

Boucher, D., Bennett, C., McFarlin, B., & Freeze, R. (2009). Staying home to give birth: Why women in the Unites States choose home birth. *Journal of Midwifery & Women's Health*, *54*(2), 119–126. doi:10.1016/j.jmwh_2008.09.006

College Executive Board. (2011). *Joint statement of practice relations between obstetricians-gynecologists and certified nurse midwives/certified midwives*. Washington, DC: American College of Obstetricians and Gynecologists and American College of Nurse Midwives. Retrieved from http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000000224/ACNM.ACOG%20Joint%20Statement%203.30.11.pdf

College of Midwives of British Columbia. (1996). *Standards of practice*. Retrieved from http://www.cmbc.bc.ca/pdf.shtml?Registrants-Handbook-11-01-Standards-of-Practice

Cunningham, J. D. (1993). Experiences of Australian mothers who gave birth either at home, at a birth centre, or in hospital labour wards. *Social Science & Medicine*, *36*(4), 475–483.

De Jonge, A., van der Goes, B. Y., Ravelli, A. C., Amelink-Verburg, M. P., Mol, B. W., Nijhuis, J. G., . . . Buitendijk, S. E. (2009). Perinatal mortality and morbidity in a nationwide cohort of 529,688 low-risk planned home and hospital births. *British Journal of Obstetrics and Gynaecology*, *116*(9), 1177–1184. doi:10.1111/j.11471-0528-.2009.02175.x

Delamothe, T. (2010). Throwing the baby back into the bathwater. *British Medical Journal*, *341*, 331.

Enkin, M. (2006). Beyond the evidence: The complexity of maternity care. *Birth*, *33*(4), 265–269.

Garite, T. J., & Kim, M. H. (Eds.). (2010). Maternal and newborn outcomes in planned home birth vs. planned hospital birth: A meta-analysis [Editors' commentary]. *American Journal of Obstetrics & Gynecology*, *203*(3), 10A.

Green, J. M., Coupland, V. A., & Kitzinger, J. V. (1990). Expectations, experiences, and psychological outcomes of childbirth: A prospective study of 825 women. *Birth*, *17*(1), 15–24.

Gyte, G., Dodwell, M., Newburn, M., Sandall, J., Macfarlane, A., & Bewley, S. (2009). Estimating intrapartum-related perinatal mortality rates for booked home births: When the 'best' available data are not good enough. *British Journal of Obstetrics and Gynaecology*, *116*(7), 933–941. doi:10.1111/j.1471-0528.2009.02147

Gyte, G., Dodwell, M., Newburn, M., Sandall, J., Macfarlane, A., & Bewley, S. (2010). Safety of planned home birth [Letter to the editor]. *British Medical Journal*, *341*, c4033.

Hildingsson, I., Rådestad, I., & Lindgren, H. (2010). Birth preferences that deviate from the norm in Sweden: Planned home birth versus planned cesarean section. *Birth*, *37*(4), 288–295.

Hodnett, E. D., & Simmons-Tropea, D. A. (1987). The Labour Agentry Scale: Psychometric properties of an instrument measuring control during childbirth. *Research in Nursing*, *10*(5), 301–310.

Hodnett, E. D., Walsh, D. S., & Weston, J. (2010). Alternative versus conventional institutional settings for birth. *The Cochrane Library*, *9*, 1–53.

Horton, R. (2010). Offline: Urgency and concern about home births. *The Lancet*, *376*(9755), 1812.

Hutton, E. K., Reitsma, A. H., & Kaufman, K. (2009). Outcomes associated with planned home and planned hospital births in low-risk women attended by midwives in Ontario, Canada, 2003–2006: A retrospective cohort study. *Birth*, *36*(3), 180–189.

Janssen, P. A., Carty, E. A., & Reime, B. (2006). Satisfaction with planned place of birth among midwifery clients in British Columbia. *Journal of Midwifery & Women's Health*, *51*(2), 91–97. doi:10.1016/j.jmwh2005.10.012

Janssen, P. A., Henderson, A. D., & Vedam, S. (2009). The experience of planned home birth: Views of the first 500 women. *Birth*, *36*(4), 297–304.

Janssen, P. A., Saxell, L., Page, L. A., Klein, M. C., Liston, R. M., & Lee, S. K. (2009). Outcomes of planned home birth with a registered midwife versus planned hospital birth with midwife or physician. *Canadian Medical Association Journal*, *181*(6–7), 377–383. doi:10.1503/cmaj.081869

Keirse, M. J. (2010). Home birth: Gone away, gone astray, and here to stay. *Birth*, *37*(4), 341–346.

Kennare, R. M., Keirse, M. J., Tucker, G. R., & Chan, A. C. (2009). Planned home and hospital births in South Australia, 1991–2006: Differences in outcomes. *Medical Journal of Australia*, *192*(2), 76–80.

Kitzinger, S. (2006). *Birth crisis*. New York, NY: Routledge Press.

Lake, R., & Epstein, A. (2009). *Your best birth*. New York, NY: Hachette Book.

Leavitt, J. W. (1986). *Brought to bed: Childbearing in America, 1750–1950*. New York, NY: Oxford University Press.

Lindgren, H., & Erlandsson, K. (2010). Women's experience of empowerment in a planned home birth: A Swedish population-based study. *Birth*, *37*(4), 309–317.

MacDorman, M. F., Menacker, F., & Declercq, E. (2010). Trends and characteristics of home and other out-of-hospital births in the United States, 1990–2006. *National Vital Statistics Reports*, *58*(11), 1–14, 16.

Malloy, M. H. (2010). Infant outcomes of certified nurse midwife attended home births: United States 2000 to 2004. *Journal of Perinatology*, *30*(9), 622–627.

Mayor, S. (2010). Planned home births are linked with higher rates of neonatal mortality, study shows. *British Medical Journal*, *341*, c3551.

Menacker, F., & Hamilton, B. E. (2010). Recent trends in Cesarean delivery in the United States. *National Center for Health Statistics* (NCHS Data Brief No. 35). Retrieved from http://www.cdc.gov/nchs/data/databriefs/db35.pdf

Olsen, O. (1997). Meta-analysis of the safety of home birth. *Birth*, *24*(1), 4–13.

Olsen, O., & Jewell, M. D. (1998). Home versus hospital birth. *Cochrane Database Systemic Reviews*, (2). doi:10.1002/14651858.CD000352

Pesce, A. F. (2010). Planned home birth in Australia: Politics of science? *Medical Journal of Australia*, *192*(2), 60–61.

Rijnders, M., Baston, H., Schönbeck, Y., van der Pal, K., Prins, M., Green, J., & Buitendijk, S. (2008). Perinatal factors related to negative or positive recall of birth experience in women 3 years postpartum in the Netherlands. *Birth*, *35*(2), 107–116.

Rooks, J. P., Weatherby, N. L., Ernst, E. K., Stapleton, S., Rosen, D., & Rosenfield, A. (1989). Outcomes of care in birth centers. The national birth center study. *The New England Journal of Medicine*, *321*(26), 1804–1811.

Royal College of Obstetricians and Gynaecologists, & Royal College of Midwives. (2005). *Mutual recognition agreement: Agreement on mobility for midwifery in Canada*. Retrieved from http://cmrc-ccosf.ca/files/pdf/MRAEnglish.pdf

Royal College of Obstetricians and Gynaecologists, & Royal College of Midwives. (2007). *Home births* (Joint Statement No. 2). Retrieved from http://www.rcog.org.uk/files/rcog-corp/uploaded-files/JointStatmentHomeBirths2007.pdf

Sakala, C., & Corry, M. P. (2008). *Evidence-based maternity care: What it is and what it can achieve*. New York, NY: Milbank Memorial Fund. Retrieved from http://www.milbank.org/reports/0809MaternityCare/0809MaternityCare.html

Society of Obstetricians and Gynaecologists of Canada. (2010). SOGC policy statement. No. 251, December 2010. Returning birth to aboriginal, rural, and remote communities. *Journal of Obstetrics and Gynaecology Canada*, *32*(12), 1186–1188.

Stockdale, J., Jokinen, M., & Macdonald, S. (2010). Look out for the limitations. *Midwives*, *13*(5), 15.

Sweet, M. (2010). Science, politics and headlines in the home birth war. *British Medical Journal*, *340*, c826.

Transforming Maternity Care Symposium Steering Committee. (2009). Blueprint for action: Steps toward a high-quality, high-value maternity care system. *Women's Health Issues*, *20*(Suppl. 1), S18–S49.

Ulrich, S. (2004). First birth stories of student midwives: Keys to professional affective socialization. *Journal of Midwifery & Women's Health*, *49*(5), 390–397.

Vedam, S., Stoll, K., White, S., Aaker, J., & Schummers, L. (2009). Nurse-midwives' experience with home birth: Impact on attitudes and practice. *Birth*, *36*(4), 274–282.

Walsh, D. (2007). *Evidence-based care for normal labour and birth: A guide for midwives*. New York, NY: Routledge Press.

Warwick, C. (2010). Nurses criticize home birth risk report. *The Lamp*, *67*(8), 373.

Wax, J. R., Lucas, F. L., Lamont, M., Pinette, M. G., Cartin, A., & Blackstone, J. (2010). Maternal and newborn outcomes in planned home birth vs. planned hospital births: A meta-analysis. *American Journal of Obstetrics & Gynecology*, *203*(3), 243, e1–e8.

Wertz, R. W., & Wertz, D. C. (1979). *Lying-in: A history of childbirth in America*. New York, NY: Schocken Books.

World Health Organization. (1996). *Care in normal birth: A practical guide*. Retrieved from http://www.who.int/making_pregnancy_safer/publications/archived_publications/care_in_normal_birth_practical_guide.pdf

Zohar, N., & De Vries, R. (2011). Study validity questioned [Letter]. *American Journal of Obstetrics & Gynecology*, *204*(4), e14. doi:10.1016/j.ajog.2010.08.052

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The Birth Center: Innovation in Evidence-Based Midwifery Care

6

Eunice K. M. Ernst and Susan E. Stone

THE HISTORY OF BIRTH CENTERS IN THE UNITED STATES

As an innovation, the birth center is an accessible and cost-effective option for birthplace. Dr. Mathew Spitzer (1995), president of the nongovernmental organization, Doctors Without Borders, at the conclusion of his investigation on birth centers, stated,

> Comprehensive data have clearly demonstrated that birth centers are as safe as hospitals for low-risk births, do fewer invasive procedures and cesarean sections, are less expensive, and have high rates of patient satisfaction. Furthermore, birth centers effectively shift the locus of control of the pregnancy from physician to mother, and conform closely to ideal models of empowerment structures described in the literature. (p. 371)

In the United States, the contemporary freestanding birth center has an excellent 35-year record of safety, client and family satisfaction, and cost savings (Faison, Pisani, Douglas, Cranch, & Lubic, 1979; Garite, Snell, Walker, & Darrow, 1995; MacDorman, Menacker, & Declercq, 2010; Rooks et al., 1989; Scupholme, McLeon, & Robertson, 1986). This chapter examines the current status of the birth center movement in the United States as well as achievements and challenges during this era of health care reform. It reviews the historical shift toward hospital births in the United States and describes the contributions of the Maternity Center Association (MCA), renamed Childbirth Connection in 2005, in launching the freestanding birth center model as a viable option for place of birth and provision of midwifery care (see http://www.childbirthconnection.org).

Public Health Measures to Improve Maternal–Infant Health

Reform in the delivery of care never seems to come easily or quickly. The classic example for maternity care was the observation by Ignaz Semmelweis, Hungarian

gynecologist in the 19th century, that puerperal fever and maternal mortality was five times higher on the physician services than on the midwife services because the doctors were not washing their hands between doing autopsies and delivering babies. He tested this by requiring all students working with him to wash their hands before procedures and attending births and reduced the mortality rate for his care to almost zero. But it was fifty years before hand washing took hold. Thus, the reluctance in medicine of people and systems to change has been called the *Semmelweis effect* (*see* semmelweis.org/about/dr-semmelweis-biography).

In the early 20th century, public health measures, safe water supply, sewage disposal, and improved working and living conditions were aggressively employed in the United States in the effort to reduce high rates of maternal and infant mortality. Nursing, medicine, and public health targeted improvements in maternal–infant health through the development of prenatal care, family planning, rigorous professional preparation, hospital care for childbirth complications, attention to asepsis in hospitals, and safe management of blood transfusions, antibiotics, surgery, and anesthesia. Contrary to existing evidence of safe care by many practicing traditional midwives and unlike the professional development of midwifery in other high-resource countries, the practice of midwifery in the United States was almost eliminated during this period (Rooks, 1997).

Leaders in obstetrics engaged in debate over "the midwife problem" and successfully made the case against traditional midwifery using authoritative pronouncements that childbirth was a pathological process for the majority of women. It was asserted, "If the profession would realize that parturition viewed with modern eyes is no longer a normal function, but that it has imposing pathological dignity . . . the midwife would be impossible to even mention" (DeLee, 1915 as cited in Rooks, 1997, p. 25).

A Changing Paradigm

As births moved from home, under the care of traditional midwives, to management by obstetric/surgical specialists in hospitals, a major paradigm shift about the normalcy of birth occurred. Routine hospitalization and medical intervention for normal birth escalated. There was no need for triage for high-risk care in a hospital setting by an obstetric specialist because 99% of childbearing women gave birth in hospitals. Minimal attention was given to the informational, physical, or emotional needs of healthy, low-risk women. Hospital routines were designed to care for high-risk mothers and infants without accommodation for the majority of women with normal births. Women were often heavily sedated, thus unable to give birth. They were tied down, anesthetized, and delivered by forceps. It was not uncommon for women under the influence of heavy sedation to become agitated during their labor and then restrained either by a camisole (straight jacket) or wrist-to-bed restraints. Newborns, drugged and separated from their mothers, recovered under observation in newborn nurseries while feeding on sugar water. The evidence for maternal–infant skin-to-skin contact and early breastfeeding as requisite to maternal attachment, factors well known in the world of animal husbandry, had not yet been researched among human mothers and babies (Ernst, 1994).

The Development of the Health Care Industry

The evolving insurance industry provided significant support for the shift of birth from midwifery-attended home birth to physician-attended hospital birth, reimbursing only physician care and hospital confinement. After World War II, the insurance industry expanded, adding employer-funded health insurance plans. Background historical events shaping health care expectations, included the doubling of medical school enrollment, the GI Bill covering the cost of medical education, the Hill–Burton Act financing the building of hospitals, and Medicaid legislation for uninsured, disadvantaged families (Dawley, 2003). These far-reaching and frequently positive changes resulted in the advancement of medical technologies and pharmaceuticals that relied on equipment and supply industries to support the evolving model of health care (Relman, 1991).

On the negative side, medical interventions, often without sufficient study and evidence, became normative practice in caring for childbearing women. Examples include labor induction, augmentation, intravenous therapy, continuous electronic fetal monitoring, epidural anesthesia, and, most recently, various rationales for elective cesarean birth. These interventions, applied routinely, were fueled by the emergence of for-profit hospitals, medical specialization, health maintenance organizations (HMOs), and fee-for-service payment mechanisms. The early health reform movement merged toward a system of industrialized health care, increased costs, and fragmented care (Relman, 1991).

Nurse-Midwifery: A Model of Community-Based Birth

During this era, there were exceptions to the widespread hospital model of birth. These exceptions framed the reemergence of the midwife and the origins of the birth center movement in the United States. In the remote Appalachian Mountains of rural Kentucky, nurse-midwives, a new discipline in the United States, provided community-based care to poverty-stricken childbearing women, children, and families through the Frontier Nursing Service. In the slums of New York City, poor women were cared for in their homes by nurse-midwives from the MCA. This model of nurse plus midwife provided a clinician with a broad scope of skills in maternal health care, public health, and primary care. Working collaboratively with physicians, their services demonstrated significantly improved health care outcomes among women and infants. These services supported the natural process of birth unless medical intervention was indicated, and these nurse-midwives were pivotal in defining the practice of midwifery and developing nurse-midwifery education in the United States (Stone, 2000).

The first author (E. K. Ernst) recounts her exposure as a nursing student to hospital births where women were drugged, restrained, and "delivered" in comparison to her observation of a strong Appalachian mountain woman attended by nurse-midwives and surrounded by her family in their one-room cabin. She witnessed the empowerment of a woman in control of her labor, supported in her experience of "giving birth." This experience guided her thinking about community-based nurse-midwifery care.

Consumer Demand for Control of the Birth Experience

In the mid-1950s, Lesser and Keane (1956), a sociologist and a nurse-midwife team at New York Cornell University Medical Center, collaborated on a study asking childbearing women what they needed from their nurses. The women identified the very factors that had been lost when the paradigm shifted to the high-intervention, controlled hospital model. The women cited the need for information during pregnancy, a sustaining presence during labor, and contact with their babies after birth. Consumer demands spoke to these vacuums in care. With support from the general public as well as many nurses, midwives, and physicians, the milieu around childbirth began to change.

Information During Pregnancy

The vacuum for information in pregnancy was filled by organized childbirth education for natural birth and the promotion of breastfeeding (Noble, 2000). Classic works of this era include *Childbirth Without Fear* (Grantly Dick-Read), *Thank You Dr. Lamaze* (Marjorie Karmel), *Birth Without Violence* (Frederick Leboyer), and *Birth Reborn* (Michel Odent; as cited in Noble, 2000). An explosion of information followed. Today, the Internet provides access to past and current information on pregnancy, childbirth, birthplace options, and infant care. Mobile applications are now widely used by health care providers to communicate with the women they serve.

Sustaining Presence in Labor

Providing a sustaining presence in labor began with inclusion of fathers or family members in labor and delivery rooms and the organization of the doula movement. Continuous electronic fetal monitoring, routinely applied to low-risk women in part to relieve the bedside nursing shortage, began to be questioned. Concern was raised about the failure to provide a sustaining presence in labor with rising cesarean section rates (Haverkamp et al., 1979).

Early and Continuous Contact With the Infant

Hospital delivery services, frequently nurse-driven, reached out to the public with demonstration projects supporting early and continuous maternal contact with the newborn infant, rooming-in units, and the single uninterrupted labor-delivery setting called the Labor, Delivery, Recovery, and Postpartum (LDRP) room, where a woman entered in labor and left upon discharge without room changes (Rooks, 1997).

The Reemergence of Community-Based Maternity Care

However, for a growing number of birth activists, these innovations still restricted control over the birth experience. Some decided to give birth at home, either unattended or under the care of an emerging apprentice-trained, unlicensed midwife

(Rooks, 1997). In the late 1960s and early 1970s, the increasing number of unattended home births among educated, insured, and informed women drew media attention. Policy makers saw this movement as a potential public health problem (Rooks, 1997).

In some locations, however, there were options. A limited number of nurse-midwifery services, maternity centers, clinics, and family practice doctors had regularly provided full-scope services over the years. Although some of these services were unregulated, they responded to the needs of communities for birthplaces—clinics, offices, and in the home. These services were often characterized by environments that had a scarcity of health care providers; underserved populations unable to pay for hospital care; limited access to care in remote, rural areas; and cultural preferences for community-based birth. For instance, La Casita, established in 1946 by two nuns from the Medical Mission Sisters—Sister Mary Theophane Shoemaker and Sister Mary Patrick Shean—was a nurse-midwifery service offering care to underserved women in Santa Fe, New Mexico (Cockerham & Keeling, 2010). Another example was the nurse-midwifery service in Raymondville, Texas, along the border with Mexico, established in 1972 by Sister Angela Murdaugh, a nun in the San Franciscan Sisters of Mary order (Texas Women's University, 2010).

The Maternity Center Association (MCA) entered the debate about place of birth, speaking to the failure of the health care system to form health care teams that included midwives, mothers, and families in formulating decisions about birth. They listened to and supported the women who rejected the imposition of routine policies and medical interventions for healthy childbearing women. As described earlier, between 1930 and 1960, the MCA had operated a successful home birth service with nurse-midwives for uninsured and socially at-risk women in both east and central Harlem and in the south Bronx of New York City. They then debated whether to reestablish this service or to create a community-based center where women could come to give birth safely while retaining control over their experience. Concurrently, in 1971, the American College of Obstetricians and Gynecologists (ACOG), under the leadership of J. Robert Wilson, and the American College of Nurse-Midwives (ACNM) issued the first joint statement defining a team approach to obstetrician–nurse-midwifery practice. This statement was key in eliminating the marginalization of midwifery in the United States and creating the environment to demonstrate the birth center model (Rooks, 1997).

In the 1970's, the MCA, located in New York City, provided consultation to the Salvation Army's Booth Maternity Center in Philadelphia. This facility was converted from a home for unwed pregnant adolescents into a family-centered maternity hospital with nurse-midwives as the primary care providers (Baruffi et al., 1984). There was no such facility available in New York, and the cost of development was prohibitive. Financial estimates for reinstating a home birth service were also high. There was discussion and concern that locating the envisioned birth center within a hospital setting would compromise the freedom to develop and sustain the principles of maternal self-responsibility and control and the provision of nurse-midwives as primary care providers. The MCA decided to locate this demonstration project, named the Childbearing Center (CbC), within its

spacious, Upper East Side Manhattan townhouse located in an affluent neighborhood (Lubic, 1979).

The primary goal of the CbC was to implement and evaluate a model of care that would address the needs of low-risk childbearing women. Three concerns identified in the plan were:

- Safety: Creating a portal of entry for referral and transfer of "low-risk" women if the risk status changed. This necessitated identifying evidence-based risk criteria for enrollment into care in the birth center.
- Satisfaction: Ensuring evidence-based information in prenatal education, informed consent, and personal control over the birth experience.
- Savings: Designing a program of time- and education-intensive care that would nurture self-reliance and self-responsibility for personal and family health during childbearing and in subsequent family life while being cost effective (Lubic, 1979).

This proposal for a birth center, freestanding from the hospital setting, situated within the complex regulatory system of New York City, necessitated a different approach from previous birth center services. The model of care was presented as a continuum within the existing health care system. It aimed to provide a legitimate, recognizable, and reimbursable service with a team approach to nurse-midwifery–led primary care. The birth center proposed to serve the middle-class women seeking alternatives and to model care that shifted control of decision making about the childbirth experience to the mother and family (Lubic, 1979).

The first challenge was to approach the Certificate of Need Board about the compelling need and to assure all parties that the plan would meet requirements for construction, licensure, accreditation, liability coverage, and financial reimbursement. A multidisciplinary research advisory committee was commissioned to draft evidence-based criteria for low-risk childbearing women eligible to use the service (Lubic, 1979).

Most of the negotiations were conducted in a largely hostile environment where a "culture of fear" had been engendered, a social message purporting that all out-of-hospital births were unsafe and that midwifery care was neither necessary nor desirable. The most frequent response to the word "midwife" was, "I didn't know we had them anymore." Negotiations with the multiple agencies involved began with evidence-based information on the benefits of nurse-midwifery care and the safety of planned, organized out-of-hospital birth. After more than 3 years of intensive planning, the CbC opened in December 1975 as the first licensed birth center in the United States. Financial reimbursement came from Blue Cross Blue Shield, the major health care insurer in New York. The birth center primarily served middle-class women and modeled care that demonstrated a shift of control over decision making about the childbirth experience to the mother and family. Services focused on childbirth education, maternal and family responsibility for healthy behaviors, and an in-house nurse practitioner to provide continuity of care beyond birth (Lubic, 1979).

Replication and National Organization of the Birth Center Model

The CbC was quickly replicated by nurse-midwives establishing birth centers in other states in response to public demand for an alternative to hospital birth. In 1979, an MCA consultant conducted a national tour to assess the needs of these new birth centers. Major issues identified were needs for

- national standards,
- licensure regulations, and
- reimbursement for services.

Based on the findings, the MCA established the Cooperative Birth Center Network (CBCN) in 1981 to facilitate communication and share information. The MCA approached the American Public Health Association (APHA), the largest organization speaking for public health in the United States, for guidance in developing national standards to ensure quality and to support replication of the model. In 1982, the APHA appointed a multidisciplinary team, charging the team with issuing guidelines defining birth center licensure and regulation. APHA defined a birth center for regulatory agencies as follows, "Any health facility, place or institution which is not a hospital or in a hospital and where births are planned to occur away from the mother's residence following normal, uncomplicated pregnancy" (Section IV, A-1).

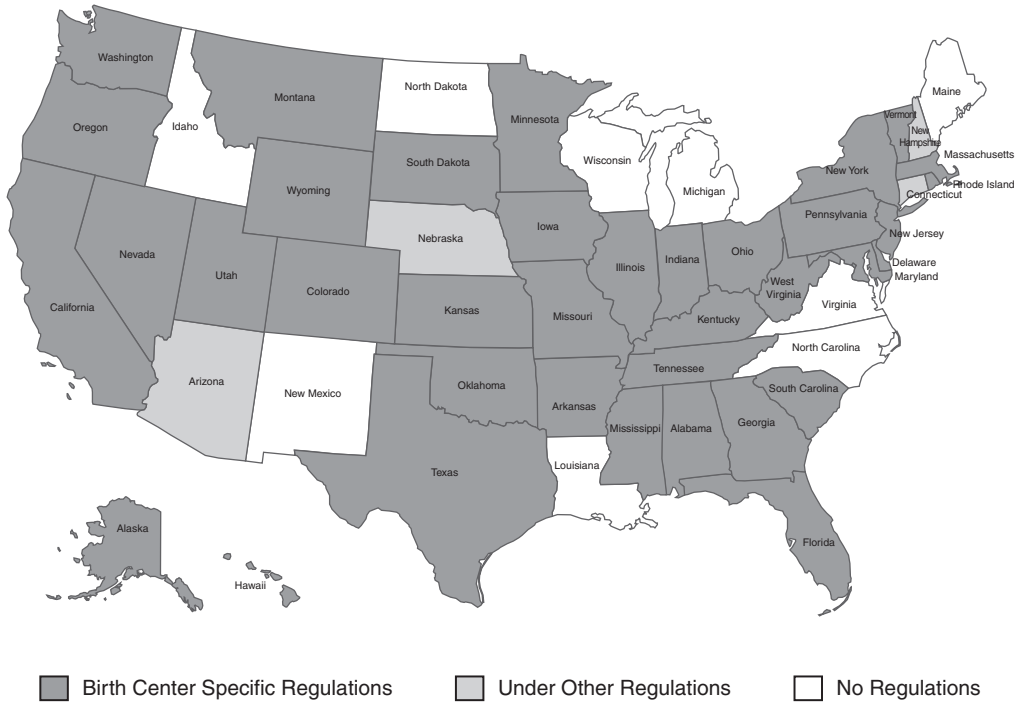
In 1983, under the direction of key players such as MCA's General Director, Ruth Watson Lubic, Phyllis Rothschild Farley, and the Board of Directors, the Cooperative Birth Center Network (CBCN) became the National Association of Childbearing Centers (NACC) with the goal of ensuring quality of care through promotion of licensure, development of national standards for accreditation, and promotion of reimbursement of services. In 2005, at the request of its members, NACC changed its name to the American Association of Birth Centers (AABC). Today, the AABC is the leader of birth center movement in the United States. Birth centers are now licensed under regulations adopted by 41 states with two states in process (see Figure 6.1). AABC (2011) developed an active program of birth center accreditation discussed in the next section.

BIRTH CENTER RESEARCH AND EVIDENCE

There are no randomized controlled trials (RCTs) in the United States comparing births in hospitals to those in freestanding birth centers. In the U.S. health care environment, it would not be possible to randomly assign pregnant women to birth site. In other high-resource nations, including England, Scotland, Sweden, Australia, New Zealand, Denmark, and the Netherlands, there are numerous studies examining both freestanding birth centers and in-hospital alternative birth settings. These studies point to the safety, satisfaction, and cost savings of birth centers (Borquez & Wiegers, 2006; Davis et al., 2011; Gottvall, Grunewald, & Waldenström, 2004; Laws, Lim, Tracy, & Sullivan, 2009; Laws, Tracy, & Sullivan, 2010; Overgaard, Møller, Frenger-Grøn, Knudsen, & Sandall, 2011; Thorgen & Crang-Svalenius, 2009; Waldenström & Nilsson, 1997; Walsh, 2007).

FIGURE 6.1

Distribution of birth centers in the United States.



Adapted from American Association of Birth Centers. (2011). *How to start a birth center: Exploring innovation in maternity care.* Perkiomenville, PA: Author.

Evaluating the Quality of Care in Birth Centers

The Blue Cross Blue Shield Study

Shortly after the implementation of the CbC, the Blue Cross Blue Shield of Greater New York commissioned a study examining outcomes at the CbC. The study compared the cost of care at the CbC with cost of in-hospital births. That study suggested that low-risk women at the CbC received high-quality care at lower cost compared to the hospital setting. The study recommended further research on the births center model across the nation (Cannoodt, Sieverts, & Schachter, 1982). In 1982, due to emerging interest in the social, psychological, and control issues surrounding birth and the safety issues of birth centers, the Institute of Medicine (IOM) commissioned a committee of eleven experts to review the current status of knowledge about birth centers and to recommend research designs that would best evaluate safety, quality of care, psychological factors, satisfaction, and cost in various birth settings (IOM, 1983).

Data Accumulation on Birth Center Outcomes

Reports on outcomes in birth centers began with a national retrospective study of eleven centers. Bennetts and Lubic (1982) published data in *Lancet* reporting

a neonatal mortality rate of 4.6 per 1000 live births between 1972 and 1979 in these eleven U.S. nurse-midwifery-run birth centers. Eakins and Richwald (1986) reported a neonatal mortality rate of 4 per 1000 live births among 2,002 births in a retrospective analysis of sixteen birth centers in California in 1984. From their survey of 102 birth centers across the nation, NAAC (1983) reported a neonatal mortality rate of 2.5 per 1000 live births.

Scupholme et al. (1986) reported comparable outcomes from a birth center affiliated with a tertiary care hospital in Miami, Florida. This birth center served primarily low-income African American and Hispanic women. The cost of care for birth center clients was shown to be 30% less compared to in-hospital clients (Scupholme & Kamons, 1987). As a result of this study as well as overcrowding in the tertiary care center, the hospital changed its policy, allowing low-risk women to be assigned to birth center care. An analysis of 148 matched pairs of low-risk women who chose birth center care compared to those women assigned to birth center care at this site showed no difference in outcomes. There was initial concern that women in the assigned group would miss prenatal appointments or fail to return for appointments after birth. This concern was not realized, as the assigned women kept their prenatal appointments and demonstrated a 100% return rate for postpartum follow-up 36 hours after discharge. Further, many of the assigned mothers returned to the birth center with subsequent pregnancies and referred their friends and family members (Scupholme & Kamons, 1987).

The Landmark National Birth Center Study

In 1982, with the emerging interest in the social, psychological, and control issues surrounding birth and the safety issues of birth centers, the Institute of Medicine of the National Academy of Sciences (IOM) determined that no birth setting had been adequately studied and commissioned a committee of eleven experts to review the current status of information and examine potential research designs to look at multiple factors affecting birth settings. (Institute of Medicine, & National Research Council, 1983)

Adopting one of the research designs recommended in the IOM report, NACC responded to the need for a large study recommended in the Blue Cross study, with a two year (1985-1987) prospective, descriptive study of 11,814 women admitted for labor in 84 freestanding birth centers in 35 states.

The National Birth Center Study conducted in collaboration with the Columbia University School of Public Health was the largest prospective study of out-of-hospital birth in the United States and evaluated the quality of nurse-midwifery care in free standing birth centers. Outcomes were comparable or better than those of low-risk women with in-hospital births.

The significantly improved outcomes over previous reports demonstrated, "…a trend toward greater safety, reflecting the implementation of state regulation and licensure, accreditation, peer review, and programs of education" (Rooks et al., 1989, p. 1805). Outcomes were comparable or better than those of low-risk women with in-hospital births. (see Table 6.1).

TABLE 6.1
Key Findings of the National Birth Center Study

Transfer rate to hospital care	15.8%
Cesarean delivery rate	4.4%
Maternal mortality	0.0%
Neonatal mortality rate	1.3%
Neonatal mortality rate excluding fatal anomalies	0.7%
Satisfaction with care (gave birth at birth center)	98.8%
Satisfaction with care (gave birth at hospital after transfer)	96.9%
Would use birth center again (gave birth at birth center)	94.0%
Would use birth center again (gave birth at hospital after transfer)	83.3%

Adapted from "Outcomes of care in birth centers: National birth center study," by J. P. Rooks, N. L. Weatherby, E. K. Ernst, S. Stapleton, D. Rosen, and A. Rosenfield, 1989, *The New England Journal of Medicine*, *321*(26), pp. 1804–1811.

The researchers concluded,

> Few innovations in health care service promise lower cost, greater availability, and a high degree of satisfaction with a comparable degree of safety. The results of this study suggest that modern birth centers can identify women who are low risk for obstetrical complications and can care for them in a way that provides these benefits. (Rooks et al., 1989, p. 1810)

Between 1985 and 1987, using the National Birth Center Study instrument, NAAC collected data on 2,256 births in 15 hospital-based nurse-midwifery practice sites. Outcomes were comparable between birth centers and hospitals but in-hospital births were associated with increased medical intervention (Fullerton & Severino, 1992). The study was first published in the *New England Journal of Medicine* (Rooks et al., 1989) and subsequently in a three-part series in the *Journal of Nurse-Midwifery* (Rooks, Weatherby, & Ernst, 1992a, 1992b, 1992c).

The San Diego County Study

A systems study examined an innovative model of maternal health care delivery in San Diego, California. This model brought together a private nurse-midwifery–obstetrician collaborative practice, the public community clinic health system, a tertiary university hospital, and a freestanding birth center aiming to improve access to prenatal care for the growing number of underserved pregnant women in San Diego County. Nurse-midwives provided all prenatal care for the collaborative practice and attended all the births in the birth center. The physicians attended all the planned hospital births. This service rapidly grew to 600 births annually at the birth center. High-quality collaborative care was demonstrated, and maternal–infant outcomes were comparable to those of the National Birth

Center Study (Jackson et al., 2003). The nurse-midwives in the project subsequently reported challenges in maintaining personalized, family-centered care in the face of organizational growth and fiscal stresses with the publicly funded system of payment (Dickinson, Jackson, & Swartz, 1994).

The Uniform Data Set

Evidence on birth centers is currently being collected by the AABC. The Uniform Data Set (UDS) is a tool for collecting prospective data on 189 variables. As of December 2011, the UDS is currently tracking more than 50,000 women enrolled for care in 76 birth centers.

Study of Clinical Practice

Prior to the 1980s, vaginal birth after cesarean (VBAC) was not an approved or common practice. Repeat cesarean birth was the standard of practice. Increasing numbers of women unwilling to have repeat cesarean birth only on this basis requested VBAC. Unable to find practitioners and facilities willing to allow VBACs, they turned to birth centers. Due to the risk of uterine rupture, birth centers were ineligible to provide VBAC by established criteria. Some women turned to home birth, unattended or attended by unlicensed midwives. In 1989, the NACC Standards Committee developed criteria for VBAC in birth centers and approved a prospective study of VBAC after low transverse cesarean section for eligible low-risk women.

Although the controversy about VBAC as a standard of practice continued across the nation, the NACC conducted a 10-year trial of VBAC in birth centers. This prospective study was conducted in 41 birth centers ($n = 1453$ women attempting VBACs). The perinatal mortality rate exceeded that of the non-VBAC population in birth centers as shown previously in the National Birth Center Study (Lieberman, Ernst, Rooks, Stapleton, & Flamm, 2004). The principal investigators and the study advisory committee concluded,

> The desire for care by a midwife may be one motivation for choosing an out-of-hospital birth [and] because out of hospital birth is not a safe choice for women with prior cesarean deliveries; hospitals should provide the option of care by a midwife/obstetrician team for women seeking VBAC within the hospital setting. (p. 941)

The debate about VBAC is far from settled, but the VBAC study in birth centers helped to shape the national discourse. For a time, the national accrediting body for birth centers, the Commission for the Accreditation of Birth Centers (CABC), was not accrediting birth centers that admitted women with prior uterine surgery.

In 2008, Rossi and D'Addario published results from multicenter research, concluding that women with prior successful VBAC were at low risk for complications during subsequent VBAC trials. In the same year, the ACOG (2008) concluded that VBAC birth was appropriate in hospitals, birth centers attached to hospitals,

and accredited freestanding birth centers, and they recognized the AABC standards for accreditation. Once new evidence became available, the CABC's guidelines changed to permit VBAC under specific conditions (AABC, 2008b). The CABC now accepts VBAC practice in accredited centers if the birth centers demonstrate compliance with the AABC standards on VBAC (AABC, 2008b; CABC, 2011).

THE BIRTH CENTER AS PRACTICE SITE: BEST PRACTICES

The birth center is an ideal practice site for implementing the midwifery model of care. The challenge is to implement the hallmarks of midwifery practice and family-centered care while running the birth center business and dealing with fiscal realities.

Promoting Education for Nurses and Nurse-Midwives

Critical barriers to dissemination of the birth center model have been first the deficits in educating a sufficient number of nurses and nurse-midwives and, subsequently, preparing nurse-midwives to establish and manage birth centers as businesses. The growing use of the Internet as an educational medium has been a partial solution, launching midwifery education into the most distant communities in the nation. Frontier Nursing University's community-based nurse-midwifery education program (CNEP) was the first distance learning graduate program for nurse-midwives, providing leadership toward increasing the number of nurse-midwives prepared to establish birth centers (Osborne, Stone & Ernst, 2005).

Increasing the enrollment of nurse-midwives in educational programs has been almost completely dependent on access to in-hospital obstetrical services, where 99% of women in the United States receive care (MacDorman et al., 2010). Birth centers are too few to accommodate all clinical teaching needs for nurse-midwifery education, let alone the educational needs of both obstetrical residents as well as nursing and medical students in basic programs. The result is that few nursing or nurse-midwifery students have the opportunity to observe or to undergo clinical training in birth centers. In-hospital midwifery-led service units and joint nurse-midwifery obstetrical residencies are nonexistent in the United States. As the source of revenue supporting obstetrical residency programs, Medicare cannot, under present regulations, financially support nurse-midwifery residency programs (Iglehart, 2011). The irony is that obstetrical residencies and basic medical education programs already engage practicing nurse-midwives to teach their students and fellows about normal birth.

In spite of evidence supporting adoption of the midwifery model of care by nurses, the nursing profession and, specifically, obstetrical nurses continue to have substantial influence on the role that nurse-midwifery plays in the delivery of health care, including birth center care (Cragin & Kennedy, 2006). As a best practice, early exposure to the birth center model of care needs to be integrated into basic nursing education and into continuing education for obstetrical nurses. Without overcoming these barriers to education, the potential of birth centers as a best practice for normal birth in the United States is hampered.

As a best practice in promoting education for nurse-midwives about the birth center model of care and to encourage the establishment of birth centers, the AABC conducts regional workshops entitled "How to Start a Birth Center." These workshops are offered quarterly at accredited birth center locations across the nation for both midwives and midwifery students. These workshops include a tour of a local birth center, discussion on the role of the birth center in promoting normal birth, information on how to start the business, and suggestions for working collaboratively and establishing networks within the existing health care system. Participants in the workshop receive educational materials as well as follow-up counseling and assistance in developing a birth center business (AABC, 2011). As a best practice, Frontier Nursing University's CNEP program requires attendance by all nurse-midwifery students at one of these regional workshops as well as offering clinical placement in birth centers as possible.

Collaborating With Certified Professional Midwives

As more women seek midwifery care in birth centers, Certified Professional Midwives (CPM) are licensed as credentialed care providers educated through a variety of pathways and have become involved in establishing birth centers or working with CNMs in their birth centers. The birth center, as an institution for the practice of midwifery, is becoming a bridge for CPMs and CNMs to demonstrate working together within their individual scope of practice.

Organizing Support for Best Practices in Birth Centers

The AABC (2011), as the leading organization for the birth center movement in the United States, exemplifies best practice by providing the standards for establishing and managing birth centers.

Accreditation

Accreditation standards aim to assure the public and regulatory bodies that the personnel and the services provided are legal, ethical, accessible, and available. The birth center provides primary health care. As such, it is mandated to triage and refer when the processes of childbearing deviate from normalcy. While providing first-line care, the birth center is interdependent with laboratory services, obstetrical specialists, and emergent and acute care services. As a primary health care service, the birth center reduces the potential for inappropriate and overuse of technology and promotes the normalcy of childbearing for low-risk women (AABC, 2011).

Birth center care is built on the midwifery model of care. Accreditation standards require that the midwife be qualified and licensed. All practitioners are expected to embrace the philosophy of midwifery and have the requisite skills to manage normal birth in the birth center and refer complicated birth to an acute care setting. The midwifery model of care encompasses knowledge, attitudes, and

skills in the prevention of disease; the promotion of health and individual responsibility for health care; and partnering with the woman, the family, and the health care system (AABC, 2011).

The CABC was established by AABC for the purpose of accreditation of birth centers. The CABC commissioners are volunteers representing obstetrics, pediatrics, midwifery, nursing, administration, and consumers. In order to contain cost to the centers, the site-visiting teams are also volunteers with experience in birth center operation and expertise in conducting health care site evaluations. Accreditation is a voluntary process but has become a marketing tool for birth centers as insurers seek an indication of quality for reimbursement of services (AABC, 2011). The CABC accrediting process and the enrollment in accredited birth center care by low-risk childbearing women are endorsed by the ACOG (2008).

Among some of the critical requirements for accreditation, the birth center under review must meet

- written policies and procedures reflecting a standard of quality,
- formal relationships with other community health agencies for complementary services,
- arrangements for referral and transfer to other levels of care, and
- access to an acute care obstetrical/newborn unit (AABC, 2011).

Eligibility for Birth Center Care

The legal parameters of eligibility for birth center care have been defined by AABC (2011) for the purposes of public and professional education and protection. These parameters define who is eligible for care, where the care should occur, and the components of the program of care (see Exhibit 6.1).

Liability

Affordable liability insurance coverage has continued to be a difficult and costly expense for all providers of maternity care services, including birth centers. Although still expensive, the AABC continues to seek and negotiate affordable coverage. The situation is currently eased with three national and several regional liability insurers offering liability insurance for qualified midwives and birth centers (AABC, 2011).

Reimbursement

Birth centers began as single service units, unlike hospitals with multiple services that could afford to allow maternity services to serve as a "loss leader" in the total revenue stream. The initial users of birth centers were affluent women who paid out pocket when insurance coverage was denied. When the MCA opened their second center in collaboration with Morris Heights Health Center to serve low-income

EXHIBIT 6.1

Eligibility for Birth Center Care

People
Healthy women anticipating a low-risk pregnancy and birth.
Licensed, qualified staff with full comprehension of limits of midwifery practice and insured for professional liability and qualified obstetric/pediatric consultants.
Place
Homelike—a maximized home rather than a mini-hospital.
Meets all construction, fire and safety, and health codes.
Equipped to provide routine care and initiate emergency procedures.
Freestanding facility—separate from acute obstetric/newborn care with autonomy in formulation of policy and management of operation.
Located so that there is reasonable C-section capability.
Program
Orientation and informed consent.
Antepartum care including continuous screening by history, physical exam, routine laboratory tests, and health counseling.
Plan for participation of family members as defined by woman receiving care.
Educational program that includes component of self-care/self-help.
Plan for payment of services.
Twenty-four-hour telephone access to care provider.
Intrapartum care with nurse-midwife or physician in constant attendance during active labor.
Postpartum/newborn care supervised by licensed nurse or midwife.
Required newborn laboratory screening tests.
Plan for newborn health supervision at center or by referral.
Home-office visits for postpartum newborn follow-up.
Provision for support in parenting and breastfeeding.

Adapted from *How to start a birth center: Exploring innovation in maternity care*, by the American Association of Birth Centers, 2011, Perkiomenville, PA: Author.

families living in the southwest Bronx, Medicaid was the primary insurer (AABC, 2008a).

Insurers have not always recognized that birth center charges closely reflect the cost for delivery of services. Although most Medicaid programs have paid the nurse-midwife provider, fewer have paid the birth center facility fee. In 2008, 157 birth centers responded to an AABC survey on Medicaid reimbursement. Among the responding centers, 66% accepted Medicaid clients. In 39% of those centers, 50% of their caseload consisted of low-income families covered by Medicaid or similar programs. Among those centers not accepting Medicaid clients, the primary reason was lack of reimbursement (AABC, 2008a). The Affordable Care Act (ACA) for reforming health care has mandated that Medicaid payment for nurse-midwives be adjusted from a previous level of 65% to 100% of payment rendered to physicians for comparable services. It has also mandated that Medicaid provide reimbursement for the birth center facility services (Patient Protection and Affordable Care Act, 2009).

Most private health care insurers now reimburse for both birth center facility services and care providers' professional fees. Overcoming the former disparity

between nurse-midwife and physician reimbursement removes a major barrier not only for the fiscal management of birth centers but also for physician practices and hospitals that plan to include midwifery-led units or birth centers in their services (AABC, 2011).

Establishing Demonstration Models

Demonstration models provide powerful road maps for replicating best practices. No discussion of demonstration models or best practices in birth center care is complete without highlighting the work of Dr. Ruth W. Lubic in bringing the birth center model to urban, impoverished families. In 1988, replicating the CbC model, which primarily reached middle-class women, Dr. Lubic and the MCA established a birth center in the most impoverished neighborhood of the southwest Bronx in New York City. Birth outcomes were comparable to other birth centers, regardless of economic status and ethnicity, and the word "empowerment" began to arise in client and family descriptions of their experiences (R. W. Lubic, ongoing personal communication and multiple interviews in 2011). The film *Hope Reborn*: *Empowering Families in the South Bronx* (MCA, 1994) captured the experiences of empowerment. One young African American mother stated,

> You feel that, I did this . . . I brought this life into the world . . . you feel that you have given life and if you can do this you can do anything . . . I can go to school . . . I can get a job. I can take care of my baby . . . you can do anything as long as you put your mind to it . . . and I think that is the best thing about the whole birth center concept . . . that it empowers women and, in turn, empowers the family . . . and empowers the community . . . and it grows and grows.

Dr. Lubic turned over the governing of the center to a group of birth center mothers. When the center ownership was transferred to the nearby community health center, these mothers incorporated the Council for Empowering Families to continue their work for the center and the community. About the process, Dr. Lubic stated,

> What the birth center does is that by turning over some of the power to the people, everything multiplies exponentially. The minute the families are involved and bring their energy and their human resources to the project, it is unlimited what can happen . . . because whenever a baby comes into this world, hope comes back again. . . . (MCA, 1994)

When Dr. Lubic received support from the MacArthur "Genius" Award in 1993, she left MCA to establish the Family Health and Birth Center (FHBC) in Washington DC's fifth and sixth wards, a low-income neighborhood with one of the highest infant mortality rates in the country. The aim was to develop a demonstration model with a comprehensive range of services, with the potential of reducing health disparities among that population. Within 7 years, FHBC, the

Healthy Babies Project (HBP), and Nation's Capital Child and Family Development (NCCFD) entered into partnership under the umbrella of DC Developing Families Center (DCDFC). This center subsequently has become a model of best practice, personal empowerment, and community development. Each of the partners in this community development center offer services toward improving the well-being of the community (R. W. Lubic, ongoing personal communication and multiple interviews in 2011).

The DC Developing Families Center

The FHBC, as a division of the DCDFC, operates in affiliation with the Washington Hospital Center where the nurse-midwives attend women who choose or need in-hospital birth. Doula services are offered to all women who give birth with the nurse-midwives, whether at the birth center or at the hospital. Nurse-midwives provide well-woman care for birth center mothers throughout the woman's life span. Breastfeeding peer counseling is offered by women who have breastfed and have been trained by La Leche League International (LLLI) to support other breastfeeding women. The pediatric nurse practitioner service follows the newborns from birth to adulthood for preventive and minor illness care. Support groups for both fathers and mothers and group prenatal care are also offered. To support hygiene among the most impoverished families with limited access to laundry facilities, washers and dryers are available (R. W. Lubic, ongoing personal communication and multiple interviews in 2011).

The HBP is another division of the DCDFC. It provides outreach, social services, case management, and education to the families in the center. The Early Childhood Development Center conducts early childhood education and development program for children ages 6 weeks to 3 years who are enrolled in the DCDFC. The combination of services at the DCDFC provides care grounded in the social context and environment of the community (R. W. Lubic, ongoing personal communication and multiple interviews in 2011).

Outcomes in the DC Developing Families Center

Among the population served in the DCDFC, health disparities have been reduced and perinatal outcomes have been improved as evidenced by reduction in perinatal morbidity and mortality, lower cesarean birth rates, lower medical intervention, higher rates of breastfeeding, higher satisfaction, more responsibility for personal health, and the expressed sense of empowerment of the women and their families (Lubic & Flynn, 2010).

As a model site visited by professionals and policy makers nationally and globally, the DCDFC is acknowledged in the IOM (2010) report, *The future of nursing: Leading change, advancing health*. The DCDFC provides a road map for birth centers in the United States. This center exemplifies best practices in caring for vulnerable populations, reducing health disparities, and building a sense of empowerment in the community.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 6.1

Preparing to Open a Birth Center

Jane, an RN in a maternity unit in a small community hospital with no nurse-midwives, had previously experienced a wonderful birth with a nurse-midwife in a different hospital. She now decided to become a nurse-midwife and enrolled in a community-based distance education program.

During her educational program, she was introduced to freestanding birth centers. Her academic program required her to conduct a community assessment in her own community, determining readiness for a freestanding birth center. She held focus groups with women of childbearing age in her community and she soon realized that there were many women interested in a natural, noninterventive birthing experience unlike what was currently offered in her place of employment. The women described a homelike facility where they would be well cared and where they and their family could participate actively in the birth. She interviewed the local obstetricians, discovering that they supported the idea because they were aware of low-risk women seeking a different type of experience from that offered in the community hospital. They also stated they were so busy with high-risk women that it would be a relief.

In her program, Jane developed a business plan for establishing a freestanding birth center. She learned about state regulations, facility requirements, and the financial investment in start-up and operation of a birth center. She investigated local health insurance companies as well as Medicaid determining that they did reimburse for birth center care. She visited freestanding birthing centers in other communities and attended the American Association of Birth Centers workshop where she met Terry, a certified nurse-midwife (CNM) in her community who also wanted to open a birth center. She even did part of her intrapartal clinical rotation in a birth center with a preceptor who owned a freestanding birth center. Jane dreamed of a birth center in her community.

Jane graduated, became certified, and built her initial experience as a nurse-midwife. She continued to dream of a birth center and found an ideal site three blocks from the hospital, enabling timely transfers if necessary. Jane and Terry pooled their resources and took their business plan to the bank to apply for a loan.

Five years later, the birth center attends to approximately 125 births per year with a C-section birth around 5% and high expressed satisfaction among the women and their families. Outcomes are good with appropriate transfers to the local hospital as needed. Birth center care costs 40% less than low-risk birth at the local hospital and insurers have noticed. There is an active volunteer group of mothers who have given birth at the birth center who serve as peer support mentors.

(continued)

CASE STUDY *(continued)*

Exemplar of Best Practice

Jane gained knowledge and developed essential skills for opening and managing a birth center as part of her nurse-midwifery education. A portion of her intrapartal experience was in a birth center, enabling her to make a comparison between the hospital and the birth center as sites for attending low-risk births. The role modeling of her faculty and her preceptor in the birth center helped her to formulate her values about normal birth and birth center care.

REFERENCES

American Association of Birth Centers. (2008a). *AABC Medicaid survey of birth centers* (pp. 1–2). Retrieved from http://www.birthcenters.org/webfm_send/76

American Association of Birth Centers. (2008b). *VBAC study* (Position Statement) (pp. 89 AABC, 2008b). Retrieved from http://www.birthcenters.org/about-aabc/position-statements/vbac-study.php

American Association of Birth Centers. (2011). *How to start a birth center: Exploring innovation in maternity care*. Perkiomenville, PA: Author.

American College of Obstetricians and Gynecologists. (2008). *ACOG statement on home births*. Retrieved from http://www.cfmidwifery.org/pdf/ACOGPRnr0206082cfm.pdf

American Public Health Association. (1982). *Guidelines of licensing and regulating birth centers* (Policy Statement Database, Policy No. 8209 [PP]). Retrieved from http://www.apha.org/advocacy/policy/policysearch/default.htm?id=1013

Baruffi, G., Dellinger, W. S., Jr., Stobino, D. M., Rudolph, A., Timmons, R. Y., & Ross, A. (1984). A study of pregnancy outcomes in a maternity center and tertiary care hospital. *American Journal of Public Health*, *74*(9), 973–978.

Bennetts, A. B., & Lubic, R. W. (1982). The free-standing birth centre. *Lancet*, *1*(8268), 378–380.

Borquez, H. A., & Wiegers, T. A. (2006). A comparison of labour and birth experiences of women delivering in a birthing centre and at home in the Netherlands. *Midwifery*, *22*(4), 339–347. doi:10.1016/j.midw.2005.12.004

Cannoodt, L., Sieverts, S., & Schachter, M. (1982). Alternatives to the conventional in-hospital delivery: The Childbearing Center experience. *Acta Hospitalia*, *22*(4), 324–339.

Cockerham, A. Z., & Keeling, A. W. (2010). Finance and faith at the Catholic Maternity Institute, Santa Fe, New Mexico 1944-1969. *Nursing History Review*, *18*, 151–166.

Commission for the Accreditation of Birth Centers. (2011). *Policy regarding vaginal birth after cesarean section in accredited birth centers*. Retrieved from http://www.birthcenteraccreditation.org/2011/07/cabc-vbac-policy-adopted-june-2008/

Cragin, L., & Kennedy, H. P. (2006). Linking obstetric and midwifery practice with optimal outcomes. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *35*(6), 779–785.

Davis, D., Baddock, S., Pairman, S., Hunter, M., Benn, C., Wilson, D., . . . Herbison, P. (2011). Planned place of birth in New Zealand: Does it affect mode of birth

and intervention rates among low-risk women? *Birth*, *38*(2), 111–119. doi:10.1111/j.1523-536X.2010.00458

Dickinson, C. P., Jackson, D. J., & Swartz, W. H. (1994). Making the alternative the mainstream. Maintaining a family-centered focus in a large freestanding birth center for low-income women. *Journal of Nurse-Midwifery*, *39*(2), 112–118. doi:10.1016/0091-2182(94)90020-5

Eakins, P. S., & Richwald, G. A. (1986). *Free-standing birth centers in California: Structure, cost, medical outcome and issues (The California Birth Center Study)*. Berkeley, CA: UCLA Department of Public Health and Stanford University Institute for Research on Women and Gender.

Ernst, E. K. (1994). Health care reform as an ongoing process. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *23*(2), 129–138.

Faison, J. B., Pisani, B. J., Douglas, R. G., Cranch, G. S., & Lubic, R. W. (1979). The childbearing center: An alternative birth setting. *Obstetrics and Gynecology*, *54*(4), 527–532.

Fullerton, J. T., & Severino, R. (1992). In-hospital care for low-risk childbirth. Comparison with results from the National Birth Center Study. *Journal of Nurse-Midwifery*, *37*(5), 331–340.

Garite, T. J, Snell, B. J., Walker, D. L., & Darrow, V. C. (1995). Development and experience of a university-based, freestanding birth center. *Obstetrics and Gynecology*, *86*(3), 411–416.

Gottvall, K., Grunewald, C., & Waldenström, U. (2004). Safety of birth centre care: Perinatal mortality over a 10-year period. *British Journal of Obstetrics and Gynaecology*, *111*(1), 71–78. doi:10.1046/j.1471-0528.2003.00017

Haverkamp, A. D., Orleans, M., Langendoerfer, S., McFee, J., Murphy, J., & Thompson, H. E. (1979). A controlled trial of the differential effects of intrapartum fetal monitoring. *American Journal of Obstetrics and Gynecology*, *134*(4), 399–412.

Iglehart, J. K. (2011). The uncertain future of Medicare and graduate medical education. *The New England Journal of Medicine*, *365*(14), 1340–1345.

Institute of Medicine. (2010). *The future of nursing: Leading change, advancing health. Nurse midwives and birth centers*. Washington, DC: The National Academy Press.

Institute of Medicine, & National Research Council. (1983). *Research issues in the assessment of birth settings*. Washington, DC: The National Academy Press.

Jackson, D. J., Lang, J. M., Swartz, W. H., Ganiats, T. G., Fullerton, J., Ecker, J., & Nguyen, U. (2003). Outcomes, safety, and resource utilization in a collaborative care birth center program compared with traditional physician-based perinatal care. *American Journal of Public Health*, *93*(6), 999–1006.

Laws, P. J., Lim, C., Tracy, S., & Sullivan, E. A. (2009). Characteristics and practices of birth centres in Australia. *The Australian & New Zealand Journal of Obstetrics and Gynaecology*, *49*(3), 290–295. doi:10.1111/j.1479-828X.2009.01002

Laws, P. J., Tracy, S. K., & Sullivan, E. A. (2010). Perinatal outcomes of women intending to give birth in birth centers in Australia. *Birth*, *37*(1), 28–36. doi:10.1111/j.1523-536X.2009.00375

Lesser, M. S., & Keane, V. R. (1956). *Nurse-patient relationships in a hospital maternity service*. St. Louis, MO: Mosby.

Lieberman, E., Ernst, E. K., Rooks, J. P., Stapleton, S., & Flamm, B. (2004). Results of the national study of vaginal birth after cesarean in birth centers. *Obstetrics and Gynecology*, *104*(5 Pt. 1), 933–942. doi:10.1097/01.AOG.0000143257.29471.82

Lubic, R. W. (1979). *Barriers and conflict in maternity care innovation*. Doctoral dissertation, Teachers College, Columbia University—New York. Retrieved from http://www.birthcenters.org/store/reference-materials/barriers-and-conflict-in-maternity-care-innovation

Lubic, R. W., & Flynn, C. (2010). The Family Health and Birth Center—A nurse-midwife managed center in Washington, DC. *Alternative Therapies in Health and Medicine*, *16*(5), 58–60.

MacDorman, M. F., Menacker, F., & Declercq, E. (2010). Trends and characteristics of home and other out-of-hospital births in the United States, 1990-2006. *National Vital Statistics Reports*, *58*(11), 1–14, 16.

Maternity Center Association (Producer). (1994). *Hope reborn: Empowering families in the South Bronx* [Video]. Retrieved from http://www.birthcenters.org/

National Association of Childbearing Centers. (1983). AABC birth center update: 1983 survey. *NACC News*, *12*(3–4), 4–18.

National Association of Childbearing Centers. (1989). *Vaginal birth after cesarean section* (Opinion, Standards Committee). Perkiomenville, PA: Author.

Noble, C. (2000). Natural childbirth: Reality or myth? *Birth Issues*, *9*(1), 12–18.

Osborne K., Stone S. & Ernst E. (2005). The development of the Community-based Nurse-Midwifery Education Program: an innovation in distance learning. *Journal of Midwifery and Women's Health 50*(2), 138–145.

Overgaard, C., Møller, A. M., Frenger-Grøn, M., Knudsen, L. B., & Sandall, J. (2011). Freestanding midwifery unit versus obstetric unit: A matched cohort study of outcomes in low-risk women. *BMJ Open*, *1*(2), 1–11. doi:10.1136/bmjopen-2011-000262

Patient Protection and Affordable Care Act of 2009, H.R. 3590, 111th Cong. (2009). Retrieved from http://www.govtrack.us/congress/bill.xpd?bill=h111-3590

Relman, A. S. (1991). Shattuck Lecture—The health care industry: Where is it taking us? *The New England Journal of Medicine*, *325*(12), 854–859. doi:10.1056/NEJM199109193251205

Rooks, J. P. (1997). *Midwifery & childbirth in America*. Philadelphia, PA: Temple University Press.

Rooks, J. P., Weatherby, N. L., & Ernst, E. K. (1992a). National birth center study. Part I—Methodology and prenatal care and referrals. *Journal of Nurse-Midwifery*, *37*(4), 222–253.

Rooks, J. P., Weatherby, N. L., & Ernst, E. K. (1992b). National birth center study. Part II—Intrapartum and immediate postpartum and neonatal care. *Journal of Nurse-Midwifery*, *37*(5), 301–330.

Rooks, J. P., Weatherby, N. L., & Ernst, E. K. (1992c). National birth center study. Part III— Intrapartum and immediate postpartum and neonatal complications and transfers, postpartum and neonatal care, outcomes, and client satisfaction. *Journal of Nurse-Midwifery*, *37*(6), 361–397.

Rooks, J. P., Weatherby, N. L., Ernst, E. K., Stapleton, S., Rosen, D., & Rosenfield, A. (1989). Outcomes of care in birth centers. National birth center study. *The New England Journal of Medicine*, *321*(26), 1804–1811.

Rossi, A. C., & D'Addario, V. (2008). Maternal morbidity following a trial of labor after cesarean section vs elective repeat cesarean delivery: A systematic review with metaanalysis. *American Journal of Obstetrics and Gynecology*, *199*(3), 224–231.

Scupholme, A., & Kamons, A. S. (1987). Are outcomes compromised when mothers are assigned to birth centers for care? *Journal of Nurse-Midwifery*, *32*(4), 211–215. doi:10.1016/0091-2182(87)90112-1

Scupholme, A., McLeon, A. G., & Robertson, E. G. (1986). A birth center affiliated with the tertiary care center: Comparison of outcome. *Obstetrics and Gynecology*, *67*(4), 598–603.

Spitzer, M. C. (1995). Birth centers. Economy, safety, and empowerment. *Journal of Nurse-Midwifery*, *40*(4), 371–375. doi:10.1016/0091-2182(95)00033-G

Stone, S. E. (2000). The evolving scope of nurse-midwifery practice in the United States. *Journal of Midwifery & Women's Health*, *45*(6), 522–531.

Texas Women's University. (2010). *Texas Women's Hall of Fame: Murdaugh, Sister Angela*. Retrieved from http://www.twu.edu/twhf/tw-amurdaugh.asp

Thorgen, A., & Crang-Svalenius, E. (2009). Birth centres in the East Midlands: Views and experiences of midwives. *British Journal of Midwifery*, *17*(3), 144–151.

Waldenström, U., & Nilsson, C. A. (1997). A randomized controlled study of birth center care versus standard maternity care: Effects on women's health. *Birth*, *24*(1), 17–26. doi:10.1111/j.1523-536X.1997.0001

Walsh, D. J. (2007). A birth centre's encounters with discourses of childbirth: How resistance led to innovation. *Sociology of Health & Illness*, *29*(2), 216–232. doi:10.1111/j.1467-9566.2007.00545

Evidence-Based Practices to Promote, Support, and Protect Breastfeeding

7

Janet L. Engstrom, Paula P. Meier, and Karen DeCocker-Geist

Breastfeeding (human milk feeding; mothers' milk feeding) is associated with numerous improved maternal and infant health outcomes as well as substantial economic and environmental benefits. Despite these benefits, the number of women who initiate and continue exclusive breastfeeding in the United States remains far below national health objectives and is particularly low among the most vulnerable women and infants (Centers for Disease Control and Prevention [CDC], 2010, 2011a, 2011b). This chapter summarizes the evidence documenting the improved health, economic, and environmental outcomes associated with breastfeeding, as well as the mechanisms by which breastfeeding improves health outcomes. The recommendations by public health and professional organizations for the initiation and continuation of exclusive breastfeeding are reviewed and compared to the current rates in the United States. Evidence-based practices to promote and support breastfeeding are summarized. Finally, a case study depicting an optimal breastfeeding scenario is presented.

IMPROVED HEALTH, ECONOMIC, AND ENVIRONMENTAL OUTCOMES OF BREASTFEEDING

There is substantial evidence documenting the improved health outcomes associated with breastfeeding for mothers and their infants (Horta, Bahl, Martines, & Victora, 2007; Ip et al., 2007). Comprehensive reviews of the literature and meta-analyses performed by international and national public health organizations such as the World Health Organization (WHO; Horta et al., 2007) and the Agency for Healthcare Research and Quality (ARHQ; Ip et al., 2007) as well as professional organizations such as the American Academy of Pediatrics (AAP, 2005) and the American Dietetic Association (ADA, 2009) consistently demonstrate the improved health outcomes associated with breastfeeding for both mothers and infants. These improved outcomes extend across populations and geographic regions as well as socioeconomic and educational levels.

The improved infant health outcomes associated with breastfeeding include short- and long-term benefits that persist throughout the life span (AAP, 2005; ADA, 2009; Horta et al., 2007; Ip et al., 2007). Compared to infants fed commercial infant formula, breastfed infants have a significantly lower risk of developing gastrointestinal illness, lower respiratory infections, childhood asthma, atopic dermatitis, acute otitis media, obesity, Type 1 and Type 2 diabetes, cardiovascular disease, childhood leukemia, sudden infant death syndrome, and other causes of infant death (AAP, 2005; ADA, 2009; Horta et al., 2007; Ip et al., 2007). Children who were breastfed have higher scores on intelligence tests and better school performance when compared to formula-fed infants (AAP, 2005; ADA, 2009; Horta et al., 2007; Oddy, Li, Whitehouse, Zubrick, & Malacova, 2011). Human milk feedings are particularly important for premature infants (AAP, 2005). Premature infants fed human milk have a significantly lower risk of prematurity-specific diseases such as sepsis, necrotizing enterocolitis, chronic lung disease, and retinopathy of prematurity as well as adverse neurodevelopmental outcomes and rehospitalization after discharge from the neonatal intensive care unit (AAP, 2005; Meier, Engstrom, Patel, Jegier, & Bruns, 2010; Patel, Meier, & Engstrom, 2007).

The mechanisms by which breastfeeding improves infant health outcomes include a variety of nutritional, immunological, antimicrobial, anti-inflammatory, growth-stimulating, enzymatic, epigenetic, and prebiotic and probiotic actions (Meier et al., 2010). The composition of mammalian milks varies widely across species, and the milk of each species is configured to the unique needs of its offspring as well as the circumstances under which lactation and feeding occur (Lawrence & Lawrence, 2011). In addition to species variation, the components of milk differ between women and, in individual women, change throughout the course of a single feeding as well as throughout the day (Lawrence & Lawrence, 2011). The components of milk also change throughout lactation to meet the changing growth and nutritional needs of the offspring (Lawrence & Lawrence, 2011). Thus, it is important that infants receive their own mother's milk whenever possible.

The complexity and uniqueness of human milk is best understood by examining its evolution. Mammalian milk is hypothesized to have originated as a secretion of the innate immune system, which originally functioned as an immunoprotectant and anti-inflammatory agent that also maintained hydration of the offspring (Hartmann, 2007; Vorbach, Capecchi, & Penninger, 2006). The nutritive functions of milk are hypothesized to have evolved after the immunoprotective properties were established (Hartmann, 2007). Indeed, many of the molecules in human milk have a dual role in immunoprotection and nutrition as well as serving other functions (Hartmann, 2007). For example, lactoferrin is a potent anti-inflammatory, antimicrobial, and epigenetic agent that also plays a role in iron absorption and has a nutritive function (Czank, Mitoulas, & Hartmann, 2007). Thus, instead of classifying human milk as a food that also happens to have other beneficial properties, human milk should be considered a protective agent that also happens to be the ideal food for human infants.

The health-protecting properties of human milk include factors that promote gut growth and maturation during the early post-birth period, thereby protecting the infant from pathogens and foreign proteins (Donovan, 2006; Wagner, Taylor, &

Johnson, 2008). Human milk also has prebiotic and probiotic properties that are responsible for the initial colonization of the infant gut, which protects the infant from gastrointestinal infections as well as from developing allergies and inflammation (Caicedo, Schanler, Li, & Neu, 2005; Wagner et al., 2008). In the long term, these processes work synergistically to downregulate inflammatory processes associated with the development of several chronic diseases, including obesity, metabolic syndrome, diabetes, and inflammatory bowel disease (Meier et al., 2010). Human milk also contains stem cells that are capable of differentiating into different cell lines (Patki, Kadam, Chandra, & Bhonde, 2010). Although the significance of this finding is unknown, it is likely that these cells play a role in infant health.

In addition to the biological properties of human milk that promote health and reduce the risk of adverse health outcomes, the act of feeding at the breast may play an important role in infant neurodevelopment (Raju, 2011). The ever changing taste and smell of human milk may also play a role in infant neurodevelopment and may even be influential in lifelong food preferences and dislikes (Mennella, 2007). The skin-to-skin contact that occurs during breastfeeding may also play an important role in the microbial colonization of the infant's skin and respiratory tract (Wright & Morton, 2007). This colonization may be particularly important when the infant is in a risky environment, such as a hospital or neonatal intensive care unit. When infants acquire potential pathogens from the environment, the skin-to-skin contact with the mother colonizes the mother's skin and respiratory tract and stimulates a maternal immune response through the enteromammary pathway (Wright & Morton, 2007). The maternal immunological response results in the movement of highly specific immunoprotective substances into her milk that protect the infant (Wright & Morton, 2007). Thus, the act of breastfeeding is more than "a meal at the breast" (Raju, 2011, p. 257). Rather, breastfeeding is a "dynamic, bidirectional, biological dialogue . . . in which physical, biochemical, hormonal and psychosocial exchange take place" (Raju, 2011, p. 257), which result in improved infant health outcomes and a reduced risk of serious short- and long-term health problems.

Mothers also experience improved health outcomes from breastfeeding. Women who breastfeed their infants have a significantly lower risk of ovarian and breast cancer as well as long-term protection from Type 2 diabetes, hyperlipidemia, hypertension, and cardiovascular disease (ADA, 2009; Gunderson et al., 2010; Ip et al., 2007; Schwarz et al., 2010; Schwarz et al., 2009; Stuebe, Rich-Edwards, Willett, Manson, & Michels, 2005). Breastfeeding also plays an important role in pregnancy prevention in the early months after birth. Studies demonstrate that exclusive breastfeeding during the first 6 months after birth is a highly effective contraceptive method (Van der Wijden, Brown, & Kleijnen, 2003). This contraceptive benefit is important because child spacing is an important determinant of maternal and infant outcomes in subsequent pregnancies (Conde-Agudelo, Rosas-Bermudez, & Kafury-Goeta, 2006, 2007). A short inter-pregnancy interval is associated with an increased risk of maternal pregnancy complications such as placenta previa, placenta abruptio, and uterine rupture in women with a previous cesarean birth (Conde-Agudelo et al., 2007), as well as an increased risk of adverse perinatal outcomes such as preterm birth, low birth weight, and small gestational

age infants (Conde-Agudelo et al., 2006). Although the evidence is not conclusive, limited data suggest that breastfeeding mothers may also have a lower lifetime risk of osteoporosis and hip fracture, less iron-deficiency anemia, lose more weight in the postpartum period, and sleep better (ADA, 2009).

Comprehensive economic analyses demonstrate substantial cost savings associated with breastfeeding for families, employers, the WIC program, and the overall economy of the United States (Ball & Wright, 1999; Bartick, 2011; Bartick & Reinhold, 2010; Drago, 2011; Weimer, 2001). The immediate and most obvious cost savings for families is the amount of money saved by not purchasing formula, an average savings of about $1500 annually (Bartick, 2011). The potential savings in infant's health care costs associated with breastfeeding are substantial and estimated to be about $13 billion a year in the United States (Bartick & Reinhold, 2010). Another source of cost saving is that parents of breastfed infants miss fewer days of work to care for sick infants (U.S. Breastfeeding Committee [USBC], 2002a; Weimer, 2001). For premature infants, the lifelong benefits of human milk feeding have not yet been calculated, but the potential savings in neonatal intensive care unit and subsequent educational and societal costs are substantial. Likewise, the potential long-term cost savings of reduced rates of cancer, diabetes, and cardiovascular disease in women who have breastfed have not yet been estimated but are likely to be sizeable.

Breastfeeding also benefits the environment. The environmental benefits of breastfeeding are related to the waste and pollution associated with producing, packing, shipping, storing, and feeding commercial infant formula. Although breastfeeding mothers require a higher food intake and thereby increase agricultural demands, the production of infant formula places a much greater burden on the environment (*The Surgeon General's Call to Action to Support Breastfeeding*, U.S. Department of Health and Human Services [USDHHS], 2011). Producing infant formula involves the agricultural support of dairy animals as well as the plants used in some formulas. In addition to the agricultural demands, formula requires an extensive manufacturing process that produces pollutants and extensive waste. In addition, the packaging required to transport, store, and feed infant formula is substantial. Formula has to be packed in relatively small containers, and the packaging has to be secure to protect the product from contaminants and tampering. Finally, human milk is a renewable resource that leaves a much smaller carbon footprint than infant formula (USDHHS, 2011).

CURRENT BREASTFEEDING RECOMMENDATIONS AND STATISTICS

Breastfeeding reduces the risk of so many short- and long-term health problems that public health organizations and health professionals uniformly recommend breastfeeding as the optimal method of infant feeding for almost all infants (AAP, 2005; ADA, 2009; USDHHS, 2011; WHO, 2011). The Surgeon General of the United States, WHO, AAP, and the ADA recommend that human milk (breast milk or mother's milk) be the only food given to infants until complementary foods are introduced at approximately 6 months of age (AAP, 2005; ADA, 2009; USDHHS, 2011; WHO, 2011). After the introduction of complementary foods,

breastfeeding should continue until the child reaches 1 (AAP, 2005) to 2 years of age (WHO, 2011).

Unfortunately, the rates of breastfeeding initiation, continuation, and exclusivity in the United States are far below national goals (CDC, 2011b). *Initiation of breastfeeding* is defined as any breastfeeding or feeding of human milk for any length of time after birth; *continuation*, or duration, of breastfeeding is a measure of how long a mother continues to breastfeed her infant, and *exclusivity* is defined as giving no food to the infant other than human milk (CDC, 2011c).

The most recently available statistics demonstrate that the percentage of women who initiate breastfeeding in the United States is only 74.6%, far below the 2020 goal of 81.9% (CDC, 2011a, 2011b). Although the breastfeeding initiation rate has dramatically improved in recent decades, the United States lags far behind many other developed countries, such as the Scandinavian and European countries as well as Japan, Australia, Canada, and Mexico (Organisation for Economic Co-operation and Development, 2009). Also concerning are the disparities in breastfeeding initiation, continuation, and exclusivity. Women who are White, married, well-educated, live in a metropolitan area, and are from a higher socioeconomic status are more likely to initiate and continue breastfeeding than women who are African American, have low income, adolescent, and live in rural area (CDC, 2010, 2011a).

Although the number of women who initiate breastfeeding has risen in recent years, recent data indicate that breastfeeding continuation rates decline precipitously in the first days and weeks after birth. By 6 months after birth, only 44.3% of women are still breastfeeding, and only 23.8% of women continue to breastfeed for the recommended year (CDC, 2011a). These continuation rates are below the recommendations set in the *Healthy People 2020* goals of 60.6% for continuation of breastfeeding at 6 months after birth and 34.1% for continuation of breastfeeding at 12 months (CDC, 2011b).

Although the exclusive use of human milk is recommended as the only food for infants for the first 6 months of life, most women supplement their breastfeeding with commercial infant formula or other fluids and foods. This supplementation usually begins early, often during the maternity hospital stay. Recent data indicate that 24.5% of women who initiate lactation supplement their breastfeeding with infant formula within the first 2 days after birth (CDC, 2011a). By 3 months after birth, only 35% of women who initiated breastfeeding are still breastfeeding exclusively, and only 14.8% breastfeed exclusively for the recommended 6 months (CDC, 2011a). These health statistics demonstrate the need for effective interventions to increase the number of women who initiate and continue exclusive breastfeeding.

EVIDENCE-BASED BEST PRACTICES IN BREASTFEEDING PROMOTION AND SUPPORT

There are a number of interventions that have been demonstrated to effectively promote and support breastfeeding. These interventions include educating health care professionals (HCPs) to increase their breastfeeding knowledge and skills, promoting breastfeeding, providing breastfeeding support in the immediate postbirth period as well as after hospital discharge, using birth practices that facilitate

breastfeeding, avoiding supplements or complements to breastfeeding unless medically indicated, avoiding dispensing infant formula samples and other formula company-sponsored gifts, avoiding hormonal contraceptives that may impact milk supply and quality, using breastfeeding technologies when indicated, and facilitating breastfeeding when the mother returns to employment outside the home. For each of these interventions, the evidence and clinical implications are reviewed, with a specific emphasis on nurse-midwifery practice.

Education of Health Care Professionals

Best practices for breastfeeding begin with the education of HCPs. Numerous studies have documented that HCPs do not have the knowledge and skills needed to provide adequate care for breastfeeding women and infants, even HCPs who specialize in nurse-midwifery, obstetrics, and pediatrics (Freed, Clark, Cefalo, & Sorenson, 1995; Freed, Clark, Lohr, & Sorenson, 1995; Hellings & Howe, 2000; O'Connor, Brown, & Lewin, 2011; Register, Eren, Lowdermilk, Hammond, & Tully, 2000; Weddig, Baker, & Auld, 2011). Although most of the studies found that HCPs were supportive of breastfeeding, the studies consistently demonstrated that HCPs had deficits in the knowledge and skills needed to help women breastfeed and manage common breastfeeding problems (Freed, Clark, Cefalo et al., 1995; Freed, Clark, Lohr et al., 1995; Hellings & Howe, 2000; O'Connor et al., 2011; Register et al., 2000; Weddig et al., 2011). This lack of knowledge and skills is not surprising because studies that have examined breastfeeding information in textbooks used by health care providers demonstrate that this information is often incorrect and incomplete (Ogburn, Philipp, Espey, Merewood, & Espindola, 2011; Philipp, McMahon, Davies, Santos, & Jean-Marie, 2007). Similarly, reviews of the breastfeeding content of HCP educational programs found that the curriculum does not adequately cover breastfeeding (Boyd & Spatz, 2011). In addition, many HCPs, including nurse-midwives, report that during their education they received little or no clinical experience helping mothers with breastfeeding (Hellings & Howe, 2000). In a recent review of the literature, these knowledge and skill deficits were found to be a major barrier to achieving exclusive breastfeeding in the United States (Labbok & Taylor, 2008).

The education of HCPs is an effective method of increasing breastfeeding rates. A recent comprehensive evaluation of a structured breastfeeding curriculum for obstetric, pediatric, and family practice residents demonstrated improved knowledge and practice among these HCPs as well as increased rates of exclusive breastfeeding in their patients (Feldman-Winter et al., 2010). In addition to the basic preparation of HCPs during their education, continuing education of HCPs is also an effective method of increasing breastfeeding rates. Recent reviews of the efficacy of continuing education programs for HCPs demonstrated improved knowledge, clinical skills and practices, and counseling skills as well as increased breastfeeding continuation and exclusivity rates among their patients (Ward & Byrne, 2011; Watkins & Dodgson, 2010).

Based on these findings, systematic training of HCPs is recommended (Labbok & Taylor, 2008; USDHHS, 2011). This training should occur during formal HCP

education, and continuing education should be provided for HCPs who work with breastfeeding mothers and infants (Labbok & Taylor, 2008; USDHHS, 2011). The HCP education should include all core competencies expected of all health professionals published by the USBC (2010).

Promotion of Breastfeeding

Promoting breastfeeding is another evidence-based best practice. A recent Cochrane review demonstrated that HCPs influence a woman's decision to breastfeed and that promoting breastfeeding was an effective intervention (Dyson, McCormick, & Renfrew, 2005). The promotion of breastfeeding is especially effective among the most vulnerable women (Miracle, Meier, & Bennett, 2004). Another recent review examined both the effectiveness and ethics of promoting breastfeeding and concluded that breastfeeding promotion by the HCP was effective and an ethical mandate (Miracle & Fredland, 2007).

Some HCPs may be reluctant to promote breastfeeding due to concern for patient autonomy and the fear that they will inadvertently coerce a woman to make a decision to breastfeed or make a woman who decides to use infant formula feel guilty. Although this is a common concern, research demonstrates that knowledge of the infant health benefits of human milk influences mothers' decisions to breastfeed even when the information is presented after the birth of a baby (Miracle et al., 2004; Stuebe & Bonuck, 2011). In one study, women questioned the qualification of HCPs who did not inform them of the health benefits of breastfeeding, telling them that it was "their decision to make" (Miracle et al., 2004). Thus, all mothers should have the opportunity to learn about the improved short- and long-term health outcomes associated with breastfeeding and have the opportunity to make an informed choice about their infant feeding decision (USDHHS, 2011).

Provision of Breastfeeding Support

Support for breastfeeding is an essential, evidence-based intervention to facilitate breastfeeding. An extensive Cochrane review of 34 studies of almost 30,000 women demonstrated that both professional and lay support were effective in increasing the rates of continued and exclusive breastfeeding (Britton, McCormick, Renfrew, Wade, & King, 2007). Based on these studies, the USDHHS (2011) has concluded that support should be provided by a combination of HCPs and lay people and should be available throughout the maternity hospitalization as well as after discharge from the hospital. HCPs should have the knowledge and skills to help mothers initiate breastfeeding and manage common breastfeeding problems (USBC, 2010; USDHHS, 2011). In addition, breastfeeding mothers should also have access to lactation professionals such as lactation consultants and breastfeeding peer counselors as needed (USDHHS, 2011). Breastfeeding peer counselors can be particularly effective in providing support because they are qualified lactation professionals who also provide mother-to-mother care (Rossman, 2007; Rossman et al., 2011). This approach to support is important because a recent

meta-synthesis concluded that peer support models were more likely to provide the person-centered communication, supportive care, and trusting relationship needed to optimally facilitate breastfeeding care (Schmied, Beake, Sheehan, McCourt, & Dykes, 2011). Indeed, recent research suggests the peer counselors may be more effective than lactation consultants in promoting breastfeeding initiation and continuation as well as exclusive breastfeeding (Gross et al., 2011).

Use of Birth Practices That Support Breastfeeding

Birth practices impact breastfeeding. Recent comprehensive reviews of the literature have recommended avoiding unnecessary medical interventions during labor and birth that have a negative impact on breastfeeding, such as the use of oxytocin, intramuscular narcotic analgesia, and epidural anesthesia (Forster & McLachlan, 2007; Labbok & Taylor, 2008; Smith, 2010). One birth practice that has a positive impact on breastfeeding is the use of skin-to-skin care, a procedure in which the infant is placed between the mother's breasts immediately after birth and allowed to remain there through the first breastfeeding. A recent Cochrane review concluded that mother–infant dyads who experienced skin-to-skin care in the early post-birth period were more likely to breastfeed and to continue breastfeeding for a longer period (Moore, Anderson, & Bergman, 2007). Similarly, early feeding at the breast should be promoted immediately post-birth, a practice that takes advantage of the infant's readiness to suckle and reduces maternal postpartum blood loss (Forster & McLachlan, 2007). Early feeding at the breast is associated with increased rates of continued breastfeeding (Forster & McLachlan, 2007).

Avoidance of Supplementation

When mothers indicate that they intend to breastfeed, their infants should not receive formula and water unless medically necessary. HCPs should not offer infant formula or water unless medically necessary and should not dispense infant formula samples and other formula company-sponsored gifts. The supplementation of breastfeeding with formula or water is associated with reduced rates of breastfeeding continuation and exclusivity (Declercq, Labbok, Sakala, & O'Hara, 2009; Forster & McLachlan, 2007). Similarly, breastfeeding mothers should not be given infant formula gift packs or other promotional material. Although commercial infant formula samples are often provided to breastfeeding mothers as an emergency backup method "just in case" the mother has difficulty with breastfeeding, this practice undermines breastfeeding (Rosenberg, Eastham, Kasehagen, & Sandoval, 2008). These products send a message that either the amount or the quality of the milk is inadequate to nourish the infant exclusively. Especially susceptible to gift packs are the most vulnerable women who do not have the experience and support of family and friends to breastfeed exclusively. Research demonstrates that the receipt of formula gift packs reduces breastfeeding continuation and exclusivity (Rosenberg et al., 2008). In addition, the distribution of these packs is also a violation of the WHO policy in the distribution of formula sample packs and of the conflict-of-interest policies of most organizations (Merewood et al., 2010).

Caution in Use of Hormonal Contraception During Early Breastfeeding

Although hormonal contraceptives have been used for decades in breastfeeding mothers, there is limited research on the impact of hormonal contraception on the initiation and maintenance of lactation and subsequent infant growth and development. A Cochrane review concluded that the existing clinical trials were insufficient to determine the impact of hormonal contraception on milk quantity and quality (Truitt, Fraser, Gallo, Lopez, Grimes, & Schulz, 2003). Although the evidence is limited, a comprehensive review of the evidence conducted by the WHO concluded that combined hormonal contraceptives (those that contain both estrogen and progestin) are linked with decreased milk preproduction (WHO, 2008). Thus, combined hormonal contraceptives are not recommended for use during the first 6 months after birth by either the WHO or the U.S. medical eligibility criteria for contraceptive use (CDC, 2010b; WHO, 2009).

In contrast, the impact of progestin-only contraceptives is less clear. Although existing research suggests that there may be minimal impact on milk quantity and quality (Kapp, Curtis, & Nanda, 2010), the timing of the initiation of progestin-only contraceptives may be the key. The trigger for lactogenesis II in all mammals is the rapid decline in circulating progesterone with the birth of the placenta because high concentrations of antenatal progesterone serve as an inhibitor for the milk synthesis effect of prolactin (Lawrence & Lawrence, 2011). During this brief critical window, prolactin stimulates closure of the tight junctions in the mammary epithelium that must occur for the onset of lactogenesis II. Although there are conclusive studies in the animal literature about the inhibitory impact of progesterone on lactogenesis II, there has been limited research examining the early administration of progestin-only contraceptives on lactation and the continuation of breastfeeding. Especially unknown is the impact of progestin contraceptives on the initiation and maintenance of lactation in vulnerable mothers, such as those with premature infants who have to initiate and maintain lactation using a breast pump for an extended period, who are at risk for delayed closure of the tight junctions in the mammary epithelium. Also of concern is the potential effect of progesterone on the developing neonatal brain (WHO, 2008). Thus, the WHO recommends not introducing progestin-only contraceptives until at least 6 weeks after birth (WHO, 2008, 2009). Although the U.S. medical eligibility criteria do not limit the early introduction of progestin-only contraceptives (CDC, 2010b), many experts adhere to the more conservative approach recommended by the WHO because there is not sufficient evidence to document the impact of the early introduction of progesterone on breastfeeding and the neonatal brain.

Use of Breastfeeding Technologies

Although breastfeeding efforts should be supported and interventions avoided unless medically necessary, there are clinical situations in which technology can facilitate continued breastfeeding. Breastfeeding technologies that can be of assistance in selected cases are nipple shields, test weighing, breast pumps, and the use of the creamatocrit procedure. Nipple shields can be effective in the management

of nipple problems such as nipple pain or tissue damage (Chertok, 2009; Chertok, Schneider, & Blackburn, 2006). Nipple shields are also an effective intervention for infants who have difficulties achieving an adequate latch and sufficient suction to consume an adequate amount of milk from the breast, a common problem in preterm and late preterm infants (Meier et al., 2000; Meier, Furman, & Degenhardt, 2007). Although nipple shields were historically thought to reduce stimulation to the breast and result in decreased milk supply, the modern ultrathin silicone nipple shields facilitate milk transfer but still provide enough stimulation to the breast to maintain a satisfactory milk supply (Chertok, 2009; Chertok et al., 2006; Meier et al., 2000). Although there is evidence to support the use of nipple shields for specific nipple and infant problems, there is no evidence that the routine use of nipple shields in the absence of clinical problems is beneficial (McKechnie & Eglash, 2010). Techniques to properly place nipple shields and test their effectiveness have been reviewed (Meier et al., 2007).

Another evidence-based technological intervention that can be helpful to mothers is test weighing. Test weighing is a procedure in which the infant is weighed on a highly sensitive and accurate scale immediately before and after breastfeeding. Care is taken to ensure that the infant's clothing, swaddling, diaper, and burp cloth are not altered between the weighings. Studies have demonstrated that test weighing is an accurate measure of intake during breastfeeding when performed with a sensitive electronic scale designed for this purpose (Meier et al., 1994; Meier, Lysakowski, Engstrom, Kavanaugh, & Mangurten, 1990). For preterm infants, test weighing is far more accurate than the clinical assessment of intake using standardized clinical assessments, even when those assessments were performed by an experienced lactation professional (Meier et al., 1994; Meier, Engstrom, Fleming, Streeter, & Lawrence, 1996). Although the assessment of infant intake during breastfeeding by test weighing was originally thought to be stressful for breastfeeding mothers, a study of mother's responses to in-home test weighing found that mothers were reassured (Hurst, Meier, Engstrom, & Myatt, 2004). Another recent study found that test weighing increased mothers' breastfeeding self-efficacy and was associated with increased continuation of breastfeeding (Wilhelm, Rodehorst-Weber, Stepans, & Hertzog, 2010). Test weights during the first 2 to 4 weeks of lactation may be especially helpful for late preterm and early term infants whose suction pressures may be inadequate for effective and efficient milk removal from the breast. Similarly, mothers with risk factors for delayed onset of lactogenesis II or those with known risk factors for milk production, such as women with previous breast surgery, may especially benefit from the information provided by test weights. For these populations, test weights can prevent the use of extra formula or bottles "just to be sure" the at-risk infant consumes enough milk during breastfeeding.

Breast pumps are another technology that can facilitate the feeding of human milk to infants who are unable to feed at breast, either temporarily or long term. An appropriately selected breast pump can help women initiate and maintain an adequate milk supply, even when mothers are pump-dependent for weeks (Meier et al., 2008; Meier, Engstrom, Janes, Jegier, & Loera, 2012). For late preterm and early term infants who are frequently unable to provide adequate stimulation to the mammary gland in the early post-birth period, temporary breast pump use

that supplements or replaces ineffective feeds at breast can be critical in helping a mother achieve an adequate long-term milk supply (Meier et al., 2012).

The creamatocrit is a simple evidence-based clinical method of measuring the lipid and calorie content of human milk. This information is useful when managing infant breastfeeding problems such as slow weight gain. The procedure is performed using the same procedures as a hematocrit. Human milk is drawn into a capillary tube and centrifuged for a specified time until the liquid and lipid components of the milk are separated. Then, the lipid or cream layer is measured and used to estimate the calories in the milk (Meier et al., 2002). This procedure can be accurately and easily performed using a lightweight, quiet centrifuge designed and programmed specifically for this purpose (Meier et al., 2006). Research has demonstrated that this measurement is a highly accurate estimate of the lipid and calorie content of human milk and can be accurately performed by mothers as well as nurses (Griffin, Meier, Bradford, Bigger, & Engstrom, 2000; Meier et al., 2000; Meier et al., 2006).

Change in the Workplace Environment

About 60% of women in the United States are employed outside of the home and most return to full-time employment in the early weeks after birth (U.S. Department of Labor, 2011). Unfortunately, employment outside of the home has a negative impact on breastfeeding (Fein & Roe, 1998), and maternal employment is identified as a barrier to exclusive breastfeeding (Labbok & Taylor, 2008).

Surprisingly, a recent Cochrane review identified no randomized trials of workplace interventions to assist breastfeeding mothers (Abdulwadud & Snow, 2007). Although there is limited evidence by which to guide interventions, experts and consumers have identified a number of interventions that can assist the mother and the employer to create a breastfeeding-friendly environment (USBC, 2002b). The minimal requirements for breastfeeding support include providing adequate release time for women to express their breast milk approximately every 3–4 hours; an appropriate private, clean, and comfortable place for milk expression that is not a bathroom; access to an electrical outlet in the space for women who use an electric breast pump; close access to a sink, soap, and water as well as paper towels to allow women to wash their hands and milk expression equipment; and a refrigerated place to store their milk (USBC, 2002b). In addition to supporting breastfeeding, creating a breastfeeding-friendly workplace may also benefit employers (USBC, 2002b). A recent economic analysis suggests that employers save money when employees breastfeed their infants, as much as $3 in savings for every dollar spent in breastfeeding support (USBC, 2002b).

Often, the biggest clinical barrier is that mothers have decided to formula feed due to employment constraints before they give birth. Many vulnerable women are concerned that the babies will get used to the breast or the milk and will not be able to transfer to formula or bottles when they return to work. Health care providers can relay an important message about breastfeeding and return to employment during this critical time. First, the HCP can share that even a month of exclusive breastfeeding will have long-lasting effects on infant health, even if formula

is started after that time. Second, mothers can be taught that babies will tolerate formula better if they have had early feeds of human milk to protect the gastrointestinal tract and facilitate its growth and maturity, increasing accommodation of formula. Third, if requested, the HCP can provide a letter to the mother's employer advocating for a place for the mother to pump. However, the important message about workplace barriers is that even a few days of mother's milk will give the baby long-lasting health benefits and make the transition to formula less difficult.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 7.1

Promoting, Supporting, and Protecting Breastfeeding

Aris, a 23-year-old single, healthy primigravida, is 6 weeks pregnant and has been in a committed relationship with her partner for 2 years. At her first prenatal visit, she expresses a deep desire to breastfeed her baby. The nurse-midwife supports her decision and discusses normal breast changes in pregnancy. At each prenatal visit, the nurse-midwife discusses various aspects of breastfeeding. Near term, Aris and the nurse-midwife discuss a plan for long-term breastfeeding. Aris attends the breastfeeding class with her partner.

At 41 weeks, Aris experiences spontaneous onset of labor. She requests minimal intervention in the labor process. After a long, non-interventive labor, Aris delivers a healthy baby boy, 8 lbs. 2 oz. Immediately after birth, her nurse-midwife places the baby on Aris's chest in direct skin-to-skin contact. The baby nestles between her breasts, snuggled in a warm hat and blanket. As Aris focuses on the baby, his umbilical cord is clamped after pulsations cease. The initial Apgar scores and essential assessments are performed on the baby as he nestles on mother's chest. Nonessential routine tasks are delayed for 2 hours to facilitate bonding. The baby self-attaches to the breast, nursing for 30 minutes, and then sleeping.

The baby stays continuously with Aris until discharge. Feeding is initiated by the baby and not interrupted by the staff. The lactation consultant visits to assess and provide education as needed. Upon discharge, the hospital gives no supplementary formula and the nurse-midwife advises against receiving hormonal contraception.

After discharge, the lactation consultant calls Aris to address any questions. At the baby's well visit, the nurse-midwife encourages exclusive breastfeeding, comparing the baby's excellent growth pattern to the standards for breastfed babies. She also refers Aris to the breastfeeding support group. At Aris's 6-week postpartum visit, she decides on nonhormonal contraception, which will not impact her milk supply.

Before she returns to work at 10 weeks postpartum, Aris learns how to use a breast pump. Her employer is supportive and has provided a private space for

(continued)

CASE STUDY *(continued)*

employees to pump with adequate time, that is, to pump twice during her working hours. Her employer shares with Aris that supporting breastfeeding leads to increased employee satisfaction, a quicker return to work, fewer sick days, and long-term employee retention. Aris exclusively breastfeeds her son until she introduces complemental foods at 6 months. She continues breastfeeding for 1 year.

Exemplar of Best Practice

Aris was able to achieve her deep desire to breastfeed her baby, well-supported by the nurse-midwife and other HCPs who promoted and supported her decision through education and follow-up. They protected the breastfeeding process by promoting normal labor, skin-to-skin contact at birth, and uninterrupted time for bonding and establishment of lactation. After Aris returned to work, her employer provided a workplace environment conducive to the continuation of breastfeeding.

ACKNOWLEDGMENT

Preparation of this chapter was supported by the National Institutes of Health (NIH) Grant NR 010009.

REFERENCES

Abdulwadud, O. A., & Snow, M. E. (2007). Interventions in the workplace to support breastfeeding for women in employment. *Cochrane Database of Systematic Reviews*, (3), CD006177.

American Academy of Pediatrics. (2005). Breastfeeding and the use of human milk. *Pediatrics*, *115*(2), 496–506.

American Dietetic Association. (2009). Position of the American Dietetic Association: Promoting and supporting breastfeeding. *Journal of the American Dietetic Association*, *109*(11), 1926–1942.

Ball, T. M., & Wright, A. L. (1999). Health care costs of formula-feeding in the first year of life. *Pediatrics*, *103*(4 Pt. 2), 870–876.

Bartick, M. (2011). Breastfeeding and the U.S. economy. *Breastfeeding Medicine*, *6*, 313–317.

Bartick, M., & Reinhold, A. (2010). The burden of suboptimal breastfeeding in the United States: A pediatric cost analysis. *Pediatrics*, *125*(5), e1048–e1056.

Boyd, A. E., & Spatz, D. L. (2011). Breastfeeding and human lactation: Education and curricular issues for pediatric nurse practitioners. *Journal of Pediatric Health Care*. doi:10.1016/j.pedhc.2011.03.005

Britton, C., McCormick, F. M., Renfrew, M. J., Wade, A., & King, S. E. (2007). Support for breastfeeding mothers. *Cochrane Database of Systematic Reviews*, (1), CD001141.

Caicedo, R. A., Schanler, R. J., Li, N., & Neu, J. (2005). The developing intestinal ecosystem: Implications for the neonate. *Pediatric Research*, *58*(4), 625–628.

Centers for Disease Control and Prevention. (2010a). Racial and ethnic differences in breastfeeding initiation and duration, by state—National immunization survey, United States, 2004–2008. *Morbidity and Mortality Weekly Report*, *59*(11), 327–334.

Centers for Disease Control and Prevention. (2010b). *U.S. medical eligibility criteria for contraceptive use, 2010*. Retrieved from http://www.cdc.gov/mmwr/pdf/rr/rr59e0528.pdf

Centers for Disease Control and Prevention. (2011a). *Breastfeeding among U.S. children born 2000–2008, CDC national immunization survey*. Retrieved from http://www.cdc.gov/breastfeeding/data/nis_data/index.htm

Centers for Disease Control and Prevention. (2011b). *Healthy people 2020*. Retrieved from http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicid=26

Centers for Disease Control and Prevention. (2011c). *NIS survey methods*. Retrieved from http://www.cdc.gov/breastfeeding/data/NIS_data/survey_methods.htm

Chertok, I. R. (2009). Reexamination of ultra-thin nipple shield use, infant growth and maternal satisfaction. *Journal of Clinical Nursing*, *18*(21), 2949–2955.

Chertok, I. R., Schneider, J., & Blackburn, S. (2006). A pilot study of maternal and term infant outcomes associated with ultrathin nipple shield use. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *35*(2), 265–272.

Conde-Agudelo, A., Rosas-Bermudez, A., & Kafury-Goeta, A. C. (2006). Birth spacing and risk of adverse perinatal outcomes: A meta-analysis. *Journal of the American Medical Association*, *295*(15), 1809–1823.

Conde-Agudelo, A., Rosas-Bermudez, A., & Kafury-Goeta, A. C. (2007). Effects of birth spacing on maternal health: A systematic review. *American Journal of Obstetrics & Gynecology*, *196*(4), 297–308.

Czank, C., Mitoulas, L. R., & Hartmann, P. E. (2007). Human milk composition—nitrogen and energy content (pp. 75–88). In T. W. Hale & P. E. Hartmann (Eds.), *Hale & Hartmann's textbook of human lactation*. Amarillo, TX: Hale Publishing.

Declercq, E., Labbok, M. H., Sakala, C., & O'Hara, M. (2009). Hospital practices and women's likelihood of fulfilling their intention to exclusively breastfeed. *American Journal of Public Health*, *99*(5), 929–935.

Donovan, S. M. (2006). Role of human milk components in gastrointestinal development: Current knowledge and future needs. *Journal of Pediatrics*, *149*(5), S49–S61.

Drago, R. (2011). The WIC Program: An economic analysis of breastfeeding and infant formula. *Breastfeeding Medicine*, *6*, 281–286.

Dyson, L., McCormick, F. M., & Renfrew, M. J. (2005). Interventions for promoting the initiation of breastfeeding. *Cochrane Database of Systematic Reviews*, (2), CD001688.

Fein, S. B., & Roe, B. (1998). The effect of work status on initiation and duration of breastfeeding. *American Journal of Public Health*, *88*(7), 1042–1046.

Feldman-Winter, L., Barone, L., Milcarek, B., Hunter, K., Meek, J., Morton, J., . . . Lawrence, R. A. (2010). Residency curriculum improves breastfeeding care. *Pediatrics*, *126*(2), 289–297.

Forster, D. A., & McLachlan, H. L. (2007). Breastfeeding initiation and birth setting practices: A review of the literature. *Journal of Midwifery & Women's Health*, *52*(3), 273–280.

Freed, G. L., Clark, S. J., Cefalo, R. C., & Sorenson, J. R. (1995). Breast-feeding education of obstetrics-gynecology residents and practitioners. *American Journal of Obstetrics and Gynecology*, *173*(5), 1607–1613.

Freed, G. L., Clark, S. J., Lohr, J. A., & Sorenson, J. R. (1995). Pediatrician involvement in breast-feeding promotion: A national study of residents and practitioners. *Pediatrics*, *96*(3 Pt. 1), 490–494.

Griffin, T. L., Meier, P. P., Bradford, L. P., Bigger, H. R., & Engstrom, J. L. (2000). Mothers' performing creamatocrit measures in the NICU: Accuracy, reactions, and cost. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *29*(3), 249–257.

Gross, S. M., Resnik, A. K., Nanda, J. P., Cross-Barnet, C., Augustyn, M., Kelly, L., & Paige, D. M. (2011). Early postpartum: A critical period in setting the path for breastfeeding success. *Breastfeeding Medicine*, *6*(6), 407–412.

Gunderson, E. P., Jacobs, D. R., Chiang, V., Lewis, C. E., Feng, J., Quesenberry, C. P., & Sidney, S. (2010). Duration of lactation and incidence of the metabolic syndrome in women of reproductive age according to gestational diabetes status: A 20-year prospective study in CARDIA (Coronary Artery Risk Development in Young Adults). *Diabetes*, *59*(2), 495–504.

Hartmann, P. E. (2007). Mammary gland: Past, present, and future (pp. 3–16). In T. W. Hale & P. E. Hartmann (Eds.), *Hale & Hartmann's textbook of human lactation*. Amarillo, TX: Hale Publishing.

Hellings, P., & Howe, C. (2000). Assessment of breastfeeding knowledge of nurse practitioners and nurse-midwives. *Journal of Midwifery & Women's Health*, *45*(3), 264–270.

Horta, B. L., Bahl, R., Martines, J. C., & Victora, C. G. (2007). *Evidence on the long-term effects of breastfeeding: Systematic review and meta-analyses*. Geneva, Switzerland: World Health Organization.

Hurst, N. M., Meier, P. P., Engstrom, J. L., & Myatt, A. (2004). Mothers performing in-home measurement of milk intake during breastfeeding of their preterm infants: Maternal reactions and feeding outcomes. *Journal of Human Lactation*, *20*(2), 178–187.

Ip, S., Chung, M., Raman, G., Chew, P., Magula, N., DeVine, D., . . . Lau, J. (2007). *Breastfeeding and maternal and infant health outcomes in developed countries*. (Evidence Report/Technology Assessment No. 153. AHRQ Publication No. 07-E007). Rockville, MD: Agency for Healthcare Research and Quality.

Kapp, N., Curtis, K., & Nanda, K. (2010). Progestin-only contraceptives use among breastfeeding women: A systematic review. *Contraception*, *82*(1), 17–37.

Labbok, M., & Taylor, E. (2008). *Achieving exclusive breastfeeding in the United States: Findings and recommendations*. Washington, DC: U.S. Breastfeeding Committee. Retrieved from http://www.usbreastfeeding.org/Portals/0/Publications/Barriers-EBF-2008-USBC.pdf

Lawrence, R. A., & Lawrence, R. M. (2011). *Breastfeeding: A guide for the medical professional* (7th ed.). Maryland Heights, MO: Elsevier Mosby.

McKechnie, A. C., & Eglash, A. (2010). Nipple shields: A review of the literature. *Breastfeeding Medicine*, *5*(6), 309–314.

Meier, P. P., Brown, L. P., Hurst, N. M., Spatz, D. L., Engstrom, J. L., Borucki, L. C., & Krouse, A. M. (2000). Nipple shields for preterm infants: Effect on milk transfer and duration of breastfeeding. *Journal of Human Lactation*, *16*(2), 106–114.

Meier, P. P., Engstrom, J. L., Crichton, C. L., Clark, D. R., Williams, M. M., & Mangurten, H. H. (1994). A new scale for in-home test-weighing for mothers of preterm and high risk infants. *Journal of Human Lactation*, *10*(3), 163–168.

Meier, P. P., Engstrom, J. L., Fleming, B. A., Streeter, P. L., & Lawrence, P. B. (1996). Estimating milk intake of hospitalized preterm infants who breastfeed. *Journal of Human Lactation*, *12*(1), 21–26.

Meier, P. P., Engstrom, J. L., Hurst, N. M., Ackerman, B., Allen, M., Motykowski, J. E., . . . Jeiger, B. J. (2008). A comparison of the efficacy, effectiveness, comfort, and convenience of two hospital-grade electric breast pumps for mother of very low birthweight infants. *Breastfeeding Medicine*, *3*(3), 141–150.

Meier, P. P., Engstrom, J. L., Janes, J. E., Jegier, B. J., & Loera, F. (2012). Breast pump suction patterns that mimic the human infant during breastfeeding: Greater milk output in less time spent pumping for breast pump-dependent mothers with premature infants. *Journal of Perinatology*, *32*(2), 103–110.

Meier, P. P., Engstrom, J. L., Muratugh, M. A., Vasan, U., Meier, W. A., & Schanler, R. J. (2002). Mothers' milk feedings in the neonatal intensive care unit: Accuracy of the creamatocrit technique. *Journal of Perinatology*, *22*(8), 646–649.

Meier, P. P., Engstrom, J. L., Patel, A. L., Jegier, B. J., & Bruns, N. E. (2010). Improving the use of human milk during and after the NICU stay. *Clinics in Perinatology*, *37*(1), 217–245.

Meier, P. P., Engstrom, J. L., Zuleger, J. L., Motykowski, J. E., Vasan, U., Meier, W. A., . . . Williams, T. M. (2006). Accuracy of a user-friendly centrifuge for measuring creamatocrits on mothers' milk in the clinical setting. *Breastfeeding Medicine*, *1*(2), 79–87.

Meier, P. P., Furman, L. M., & Degenhardt, M. (2007). Increased lactation risk for late preterm infants and mothers: Evidence and management strategies to protect breastfeeding. *Journal of Midwifery & Women's Health*, *52*(6), 579–587.

Meier, P. P., Lysakowski, T. Y., Engstrom, J. L., Kavanaugh, K. L., & Mangurten, H. H. (1990). The accuracy of test weighing for preterm infants. *Journal of Pediatric Gastroenterology and Nutrition*, *10*(1), 62–65.

Mennella, J. A. (2007). Chemical senses and the development of flavor preferences in humans (pp. 403–413). In T. W. Hale & P. E. Hartmann (Eds.), *Hale & Hartmann's textbook of human lactation*. Amarillo, TX: Hale Publishing.

Merewood, A., Grossman, X., Cook, J., Sadacharan, R., Singleton, M., Peters, K., & Navidi, T. (2010). US hospitals violate HWO policy on the distribution of formula sample packs: Results of a national survey. *Journal of Human Lactation*, *26*(4), 363–367.

Miracle, D. J., & Fredland, V. (2007). Provider encouragement of breastfeeding: Efficacy and ethics. *Journal of Midwifery & Women's Health*, *52*(6), 545–548.

Miracle, D. J., Meier, P. P., & Bennett, P. A. (2004). Mothers' decisions to change from formula to mothers' milk for very-low-birth-weight infants. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *33*(6), 692–703.

Moore, E. R., Anderson, G. C., & Bergman, N. (2007). Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database of Systematic Reviews*, (3), CD003519.

O'Connor, M. E., Brown, E. W., & Lewin, L. O. (2011). An Internet-based education program improves breastfeeding knowledge of maternal-child health care providers. *Breastfeeding Medicine*, *6*(6), 421–427.

Oddy, W. H., Li, J., Whitehouse, A. J. O., Zubrick, S. R., & Malacova, E. (2011). Breastfeeding duration and academic achievement at 10 years. *Pediatrics*, *127*(1), e137–e145.

Ogburn, T., Philipp, B. L., Espey, E., Merewood, A., & Espindola, D. (2011). Assessment of breastfeeding information in general obstetrics and gynecology textbooks. *Journal of Human Lactation*, *27*(1), 58–62.

Organisation for Economic Co-operation and Development. (2009). *Breastfeeding rates*. Retrieved from http://www.oecd.org/dataoecd/30/56/43136964.pdf

Patel, A. L., Meier, P. P., & Engstrom, J. L. (2007). The evidence for use of human milk in very low-birthweight preterm infants. *NeoReviews*, *8*, e459–e466.

Patki, S., Kadam, S., Chandra, V., & Bhonde, R. (2010). Human breast milk is a rich source of multipotent mesenchymal stem cells. *Human Cell*, *23*(2), 35–40.

Philipp, B. L., McMahon, M. J., Davies, S., Santos, T., & Jean-Marie, S. (2007). Breastfeeding information in nursing textbooks needs improvement. *Journal of Human Lactation*, *23*(4), 345–349.

Raju, T. N. K. (2011). Breastfeeding is a dynamic biological process—not simply a meal at breast. *Breastfeeding Medicine*, *6*, 257–259.

Register, N., Eren, M., Lowdermilk, D., Hammond, R., & Tully, M. R. (2000). Knowledge and attitudes of pediatric office nursing staff about breastfeeding. *Journal of Human Lactation*, *16*(3), 210–215.

Rosenberg, K. D., Eastham, C. A., Kasehagen, L. J., & Sandoval, A. P. (2008). Marketing infant formula through hospitals: The impact of commercial hospital discharge packs on breastfeeding. *American Journal of Public Health*, *98*(2), 290–295.

Rossman, B. (2007). Breastfeeding peer counselors in the United States: Helping build a culture and tradition of breastfeeding. *Journal of Midwifery & Women's Health*, *52*(6), 631–637.

Rossman, B., Engstrom, J. L., Meier, P. P., Vonderheid, S. C., Norr, K. F., & Hill, P. D. (2011). "They've walked in my shoes": Mothers of very low birth weight infants and their experiences with breastfeeding peer counselors in the neonatal intensive care unit. *Journal of Human Lactation*, *27*(1), 14–24.

Schmied, V., Beake, S., Sheehan, A., McCourt, C., & Dykes, F. (2011). Women's perceptions and experiences of breastfeeding support: A metasynthesis. *Birth*, *38*(1), 49–60.

Schwarz, E. B., McClure, C. K., Tepper, P. G., Thurston, R., Janssen, I., Matthews, K. A., & Sutton-Tyrrell, K. (2010). Lactation and maternal measures of subclinical cardiovascular disease. *Obstetrics & Gynecology*, *115*(1), 41–48.

Schwarz, E. B., Ray, R. M., Stuebe, A. M., Allison, M. A., Ness, R. B., Freiberg, M. S., & Cauley, J. A. (2009). Duration of lactation and risk factors for maternal cardiovascular disease. *Obstetrics & Gynecology*, *113*(5), 974–982.

Smith, L. J. (2010). *Impact of birthing practices on breastfeeding* (2nd ed.). Sudbury, MA: Jones and Bartlett.

Stuebe, A. M., & Bonuck, K. (2011). What predicts intent to breastfeed exclusively? Breastfeeding knowledge, attitudes, and beliefs in a diverse urban population. *Breastfeeding Medicine*, *6*(6), 413–420.

Stuebe, A. M., Rich-Edwards, J. W., Willett, W. C., Manson, J. E., & Michels, K. B. (2005). Duration of lactation and incidence of type 2 diabetes. *Journal of the American Medical Association*, *294*(20), 2601–2610.

Truitt, S. T., Fraser, A. B., Gallo, M. F., Lopez, L. M., Grimes, D. A., & Schulz, K. F. (2003). Combined hormonal versus nonhormonal versus progestin-only contraception in lactation. *Cochrane Database of Systematic Reviews*, (2), CD003988.

U.S. Breastfeeding Committee. (2002a). *Economic benefits of breastfeeding*. Retrieved from http://www.usbreastfeeding.org/LinkClick.aspx?link=Publications%2fEconomic-Benefits-2002-USBC.pdf&tabid=70&mid=388

U.S. Breastfeeding Committee. (2002b). *Workplace breastfeeding support*. Retrieved from http://www.usbreastfeeding.org/Portals/0/Publications/Workplace-2002-USBC.pdf

U.S. Breastfeeding Committee. (2010). *Core competencies in breastfeeding care and services for all health professionals (Rev. ed.)*. Retrieved from http://www.usbreastfeeding.org/LinkClick.aspx?link=Publications%2fCore-Competencies-2010-rev.pdf&tabid=70&mid=388

U.S. Department of Health and Human Services. (2011). *The Surgeon General's call to action to support breastfeeding*. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General. Retrieved from http://www.surgeongeneral.gov/topics/breastfeeding/calltoactiontosupportbreastfeeding.pdf

U.S. Department of Labor. (2011). *Women in the labor force: A databook (2010 edition)*. Retrieved from http://www.bls.gov/cps/wlf-intro-2010.htm

Van der Wijden, C., Brown, J., & Kleijnen, J. (2003). Lactational amenorrhea for family planning. *Cochrane Database of Systematic Reviews*, (4), CD001329.

Vorbach, C., Capecchi, M. R., & Penninger, J. M. (2006). Evolution of the mammary gland from the innate immune system? *BioEssays*, *28*(6), 606–616.

Wagner, C. L., Taylor, S. N., & Johnson, D. (2008). Host factors in amniotic fluid and breast milk that contribute to gut maturation. *Clinical Reviews in Allergy & Immunology*, *34*(2), 191–204.

Ward, K. N., & Byrne, J. P. (2011). A critical review of the impact of continuing breastfeeding education provided to nurses and midwives. *Journal of Human Lactation*, *27*(4), 381–393.

Watkins, A. L., & Dodgson, J. E. (2010). Breastfeeding educational interventions for health professionals: A synthesis of intervention studies. *Journal for Specialists in Pediatric Nursing*, *15*(3), 223–232.

Weddig, J., Baker, S. S., & Auld, G. (2011). Perspectives of hospital-based nurses on breastfeeding initiation best practices. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *40*(2), 166–178.

Weimer, J. (2001). *The economic benefits of breastfeeding: A review and analysis* (Food Assistance and Nutrition Research Report No. 13). Washington, DC: Food and Rural Economics Division, Economic Research Service, U. S. Department of Agriculture.

Wilhelm, S., Rodehorst-Weber, K., Stepans, M. B. F., & Hertzog, M. (2010). The relationship between breastfeeding test weights and postpartum breastfeeding rates. *Journal of Human Lactation*, *26*(2), 168–174.

World Health Organization. (2008). *Technical consultation on hormonal contraceptive use during lactation and effects on the newborn*. Retrieved from http://whqlibdoc.who.int/hq/2010/WHO_RHR_10.05_eng.pdf

World Health Organization. (2009). *Medical eligibility criteria for contraceptive use* (4th ed.). Retrieved from http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en/index.html

World Health Organization. (2011). *Breastfeeding*. Retrieved from http://who.int/topics/breastfeeding/en

Wright, N. E., & Morton, J. A. (2007). Human milk, breastfeeding and the preterm infant. In T. W. Hale & P. E. Hartmann (Eds.), *Hale & Hartmann's textbook of human lactation* (pp. 215–253). Amarillo, TX: Hale Publishing.

Mental Health During Childbearing: The Evidence for the Midwifery Model of Care

8

Deborah Brandt Karsnitz and Nora Webster

PERINATAL MOOD AND ANXIETY DISORDERS

In 2004, nearly one fourth of the total adult population in the United States suffered from some form of mental health disorder, the leading cause of disability for persons aged 15 to 44 (National Institute of Mental Health [NIMH], 2010). Among the general population, depression and anxiety disorders are often comorbid in occurrence, with a 12-month prevalence rate of 9.5% for mood disorders, 6.7% for major depressive disorders, and 18.1% for anxiety disorders (Kessler et al., 2005). Women are 50% more likely than men to have mood disorder and 60% more likely than men to have an anxiety disorder (Kessler et al., 2005; NIMH, 2010; Zender & Olshansky, 2009). Considering the prevalence of these disorders, specifically in women in the identified age group, it is easy to understand why perinatal mood and anxiety disorders (PMADs) are recognized as some of the most common complications of childbearing women (Gaynes et al., 2005; Kessler et al., 2005).

Growing evidence indicates that mood and anxiety disorders are grounded in specific activators such as stressful life occurrences, lack of social support systems, unhealthy social activities, inadequate nutrition, and biologic/genetic influences (Zender & Olshansky, 2009). Barriers to health care for this significant public health problem remain high. In a fragmented health care system, mental health care providers are scarce and primary care providers, in general, lack adequate knowledge on mood and anxiety disorders. Perhaps most importantly, barriers to care and social stigma surrounding mental illness are formidable.

PMADs are the most common cause of postpartum morbidity, resulting in significant consequences for childbearing women and their families (Beck, 1995, 1998; Gaynes et al., 2005; Murray et al., 2011). Pregnancy and new motherhood are considered times of joy and satisfaction in most cultures. PMAD can replace joy with emptiness and diminished positive emotions toward motherhood (Beck, 1993).

Perinatal depression occurs among 7% to 20% of pregnant women and approximately 13% of postpartum women. Incidence rates are as high as 38% for primiparous women of lower socioeconomic status (Goodman & Tyer-Viola, 2010). This observed variance in prevalence for postpartum depression and anxiety may be confounded by studies using validated screening tools to assess depression, such as the Edinburgh Postnatal Depression Scale (EPDS), but omitting assessment for other comorbid anxiety disorders (Beck, 2006; Halbreich & Karkun, 2006; Karsnitz & Ward, 2011).

As primary care providers focused on women's health, nurse-midwives and women's health care practitioners are ideally positioned to provide PMAD assessment. These providers need to focus on early identification and education, including preventative measures as well as offer a variety of treatment options as part of a multidisciplinary team approach to perinatal mental health care. When evidence-based alternatives to the standard treatment modalities of psychotherapy and medication are included in the treatment options, women's values and preferences for care can be respected, and barriers to treatment can be reduced.

Postpartum Depression

The incidence of women experiencing a new major or minor depressive episode is 14.5% in both pregnancy and during the first 3 months postpartum (Gaynes et al., 2005). Postpartum depression (PPD) varies in severity, with major depression ranging from 1% to 5.9% of women and occurring anytime within the first year after giving birth (Gaynes et al., 2005). Symptoms of mild postpartum depression may be unrecognized because they often resemble relatively widespread experiences of pregnancy and the postpartum period such as fatigue, insomnia, and feeling overwhelmed with the new role of motherhood (Gaynes et al., 2005). Depression can begin during pregnancy with subtle signs such as fatigue, anxiety, or change in sleep or appetite habits, only becoming recognized when symptoms are exacerbated postpartum. Many new mothers with postpartum depression report symptoms such as insomnia or hypersomnia, decreased or increased appetite, sadness, isolation, feelings of hopelessness, irritability or agitation, feeling unable to cope with or care for children, and, in some cases, suicidal ideology (Beck, 2006).

Anxiety Disorders

Anxiety disorders in women are often unrecognized clinically, and as many as 58% of depressed women also have one or more anxiety disorders (Zender & Olshansky, 2009). Life stressors common in pregnancy and the postpartum period can exacerbate anxiety disorders. As with symptoms of depression, symptoms of anxiety disorders such as anxiousness, fatigue, and fluctuations of mood are often common during both pregnancy and the postpartum period. An underlying anxiety disorder may not be recognized until it becomes debilitating. The spectrum of anxiety disorders includes generalized anxiety disorder, panic disorder, obsessive–compulsive disorder, and posttraumatic stress disorder.

Generalized anxiety disorder is defined as excessive worry that occurs on most days and lasts for at least 6 months or more (American Psychiatric Association [APA], 2000). Generalized anxiety disorder has a perinatal prevalence rate of 8.5% during pregnancy and 4.4% to 8.2% during the postpartum period (Ross & McLean, 2006). In addition to extreme worry, symptoms include restlessness, muscular tension, fatigue, and lack of concentration. Because indications of generalized anxiety disorder mimic common perinatal symptoms and must be present for at least 6 months, diagnosis may be difficult. As a result, many perinatal women with generalized anxiety disorder are unrecognized and unreported (APA, 2000).

Panic disorder is characterized by recurring panic attacks occurring spontaneously. Perinatal prevalence of panic disorder ranges from 1.3% to 2% (Ross & McLean, 2006). Symptoms of panic attacks may include dizziness, heart palpitations, shortness of breath, and fear of dying. Women with panic disorder continuously experience stress, worry and dread of these attacks, and avoid situations where they think an attack might occur. Functioning within social and work situations may deteriorate as women tend to avoid environments they perceive as likely places for occurrence of an attack (Katon, 2006).

Women with obsessive–compulsive disorder are debilitated by intrusive thoughts or rituals that cause extreme anxiety relieved only by repetitive mental or physical activity such as counting, checking, or cleaning (APA, 2000). Prevalence of obsessive–compulsive disorder is 0.2% to 1% to 2% during pregnancy and 2.7%–3.9% postpartum (Ross & McLean, 2006). Women with obsessive–compulsive disorder during pregnancy and postpartum sometimes describe irrational thoughts of harming their baby, which may be construed as psychotic or homicidal ideations (Gangdev, 2002). These disturbing thoughts can be differentiated from psychosis when the woman is self-aware and expresses guilt or shame (Gangdev, 2002). Obsessive–compulsive disorder is not exacerbated by pregnancy, and depression is a common comorbidity (Uguz et al., 2007).

Posttraumatic stress disorder occurs when a woman experiences extreme psychological trauma from a real or perceived threat of death or severe trauma to self or others. Women with posttraumatic stress disorder describe feelings of intense fear and helplessness, recurring stressful thoughts and dreams, or distress if exposed to the same environment or trigger of a memory of where the trauma occurred (APA, 2000). Prevalence of posttraumatic stress disorder after childbirth varies from 1.5% to 5.6% (Beck, 2006). A woman who experiences posttraumatic stress disorder as a result of pregnancy, childbirth, or untoward events in the postpartum period may be unable to celebrate the birth of her child or psychologically cope with future childbearing. Posttraumatic stress disorder has been associated as comorbidity with postpartum depression (Beck, 2006; Loveland Cook et al., 2004).

Postpartum Psychosis

Postpartum psychosis is an uncommon and severe mental health disorder, occurring in an estimated 1 to 2 cases per 1000 childbearing women (Sit, Rothschild, & Wisner, 2006). This is the form of perinatal mood disorder that is most often

reported in the media because it is typically the illness behind postpartum homicide and infanticide. Postpartum psychosis has several distinguishing characteristics such as paranoia, delusions, significantly disorganized behavior, and extreme mood swings. All symptoms have a rapid onset early in the postpartum period and develop by 4 weeks following time of birth (Sit et al., 2006). The evidence supports the view of postpartum psychosis as a manifestation of bipolar disorder following childbirth, with contributing factors typical of the postpartum period including sleep deprivation, hormonal fluctuations, and environmental stressors (Sit et al., 2006). Immediate identification and treatment of postpartum psychosis is critically important for a safe outcome. The consequences of untreated postpartum psychosis can be fatal for a mother and her children.

The Impact of PMAD on the Childbearing Woman

PMADs are the most common cause of postpartum morbidity and represent a significant public health problem, resulting in negative health consequences for women. Quality of life is impacted as women with PMAD struggle to cope with their daily responsibilities, including their children. A woman's relationship with her partner suffers as well and often fails. Problems with both employment and social life can develop.

High stress during pregnancy increases corticotropin-releasing hormone (CRH) and has been associated with a number of unfavorable effects, including longer labor and postpartum depression (Ströhle & Holsboer, 2003). If untreated, postpartum depression can lead to chronic depression, causing women to experience agitation, mood swings, loss of interest or pleasure in usual activities, and loss of libido (Horowitz & Goodman, 2005). Severe cases of untreated or undiagnosed depression or psychosis can end in maternal suicide, infanticide, or homicide of family members (Hanna, Jarman, Savage, & Layton, 2004). Suicide during the postpartum period is a leading cause of maternal death in the United Kingdom and possibly a major cause of death in other countries (Centre for Maternal and Child Enquiries, 2011). Screening and early diagnosis of perinatal mood disorders are critical for prevention of long-term illness or escalation of already existing illness, both of which may affect quality of life for the woman and her family.

The Impact of PMAD on the Family

The quality of family life is affected when a mother suffers from PMAD and can result in adverse outcomes for infants, other children in the family, and relationships with a partner (Beck, 1998; Gaynes et al., 2005; Ströhle & Holsboer, 2003). Attachment and bonding may be affected by the mother's lack of response to her infant. The depressed woman's response to her infant's cues of cooing or crying may be diminished or even absent (Beck, 2006).

Decreased maternal–infant interaction resulting from postpartum depression may result in delayed cognitive skills and long-term emotional problems for the child (Beck & Indman, 2005). Specific long-term effects on the child include an

increased risk of developing depression by 16 years of age when a mother suffered from PPD (Murray et al., 2011). Stress in pregnancy has been associated with delayed neuromotor development in infants, which could affect cognitive development and behavioral problems later in childhood (Ströhle & Holsboer, 2003; van Batenburg-Eddes et al., 2010).

Hay, Pawlby, Angold, Harold, and Sharp (2003) studied 149 women with depression at 3 months postpartum and followed their children for 11 years. Children were tested at age 11 and found to have significantly lower IQ scores, attention problems, and difficulty in mathematics when compared to children of mothers without postpartum depression. This study revealed that depression at 3 months postpartum was a significant predictor of developmental and behavioral problems in early adolescence (Hay et al., 2003).

EXAMINING THE EVIDENCE ON PMAD

Efficacy of Screening

Screening for anxiety disorders is uncommon due to the lack of validated anxiety disorder–specific screening tools (Spitzer, Kroenke, Williams, & Löwe, 2006), and screening for perinatal depression is not a routine practice despite evidence supporting use of an instrument to identify women at risk and provide treatment options (Horowitz & Goodman, 2005; McQueen, Montgomery, Lappan-Gracon, Evans, & Hunter, 2008). The low identification rates for PMAD during routine clinical evaluation and the reluctance of women to disclose symptoms of this disorder contribute to high rates of perinatal morbidity and mortality (Delatte, Cao, Meltzer-Brody, & Menard, 2009; Dennis & Chung-Lee, 2006; Evins, Theofrastous, & Galvin, 2000; McQueen et al., 2008; Sobey, 2002).

The most widely used, validated screening tool for perinatal depression is the Edinburgh Postnatal Depression Scale (EPDS). There have been 37 validation studies performed on the EPDS since its introduction in 1987. It has been translated into 23 languages, although not all translations have been validated (Cox & Holden, 2003; Gibson, McKenzie-McHarg, Shakespeare, Price, & Gray, 2009). This brief, self-reporting screening tool consists of 10 questions. The EPDS score can provide guidance for appropriate management and open discussion with the woman. Although not validated for anxiety, this tool includes two questions that may be useful for assessing anxiety disorders during the perinatal period. The EPDS has a screening sensitivity of 86%, a specificity of 78%, and a positive predictive value of 73% (Cox, Holden, & Sagovsky, 1987).

A goal of universal screening for PMAD has been recommended by professional organizations and evidence-based practice guidelines (American College of Nurse-Midwives [ACNM], 2003; Association of Women's Health, Obstetric and Neonatal Nurses [AWHONN], 2008; McQueen et al., 2008). Although PMAD is a complex spectrum of illnesses that frequently requires a multifaceted approach to treatment, it is clear that increasing the rate of screening will improve identification of PMAD as well as the opportunities for intervention and optimal resolution.

Clinical Treatment Options

Pharmacologic Management of PMAD

Selective serotonin reuptake inhibitors (SSRIs) are usually the first-line pharmacologic treatment for perinatal mood disorders (Alwan, Reefhuis, Rasmussen, Olney, & Friedman, 2007). Other pharmacologic treatments include serotonin–norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), and benzodiazepines for anxiety disorders. Associated with dependence and abuse, benzodiazepines, once a common treatment for anxiety disorders, are rarely prescribed (Stahl, 2008). Medications for PMADs in pregnancy and postpartum require careful consideration and individualized discussion with each woman. Maternal and neonatal effects must be considered during pregnancy and breastfeeding (Hackley, 2010). Primary health care providers must survey the evidence and work as a team with the patient and a mental health expert to determine the risk versus benefit for each woman and family (Karsnitz & Ward, 2011). Complementary herbs and some supplements may also be useful, but evidence to support their use is just beginning to emerge.

Individual considerations are necessary and will provide important information to help the provider and patient choose the most effective path. Inclusion of the woman's motivation, insurance coverage, cultural belief system, or adherence for continuation of treatment must be considered (Roy-Byrne et al., 2008). Common side effects such as weight gain and decreased libido may be a concern and drive the choice of which medication may be appropriate (Karsnitz & Ward, 2011). Past history of drug use, other prescription or nonprescription drugs, or herbal supplements as well as age, nutritional status, and other medical conditions will be useful tools in making these decisions (Roy-Byrne et al., 2008).

Psychotherapy

Cognitive behavioral therapy (CBT) is useful for mild-to-moderate anxiety disorders and does not expose the fetus to medications. CBT focuses on changing specific behavioral patterns and negative thinking. Effectiveness is based on the woman's ability to identify coping mechanisms, change negative thought processes, and redirect thinking (Olatunji, Cisler, & Deacon, 2010).

Interpersonal psychotherapy (IPT) is a psychological intervention well suited for PMAD with its focus on strengthening interpersonal relationships. IPT addresses issues of conflict and stressors in key relationships, grief, loss, and role transition, all of which are factors related to mental health in the perinatal period. In postpartum women, maternal–infant attachment, relationship with a partner, and significant role transition are the typical areas of focus (Mulcahy, Reay, Wilkinson, & Owen, 2010).

A randomized controlled trial (RCT) examined a group IPT model for postpartum depression compared with a control group of individually treated women. The group IPT had a greater reduction in depression scores compared to the control group, even though both groups showed a significant improvement in depression

by the end of the RCT. During the treatment period, EPDS scores in the group IPT arm showed a change from 17.56 at baseline to 10.34 by Week 8, whereas the control group scored 16.11 at baseline with reduction to 13.77 by Week 8. The group IPT arm also showed ongoing improvement at the 3-month follow-up (Mulcahy et al., 2010).

Complementary and Alternative Therapies

Many women with PMAD are reluctant to use either pharmacological treatment or psychotherapy (both of which are evidence-based and standard of care for depression and anxiety disorders) due to personal preference, values, or barriers to care (Boath, Bradley, & Henshaw, 2004; Dennis & Chung-Lee, 2006; Dennis & Hodnett, 2007). Although the evidence supporting alternative options for treatment of PMAD is just emerging, there are several interventions that have been identified as effective. These treatments include forms of social support, exercise, and nutritional and sleep interventions. In addition to being effective strategies, these alternatives are perceived as acceptable treatment options for women with PMAD and may likely be better used by those suffering from PMAD than the standard treatments.

Sources and Barriers for Support

Despite a paucity of research specifically looking at support as an intervention for prevention of PMAD, support is emerging as an evidence-based best practice for existing PMAD. Letourneau et al. (2007) conducted a retrospective qualitative, multisite, descriptive study of 41 Canadian women and two small groups ($n = 5$ and $n = 6$) who had experienced symptoms of PPD within 2 years prior to the onset of the study, with 46% scoring >12 on the EPDS. Individual and group interviews of women in the study examined perceptions of available resources, barriers to support, and preferred type of support.

Most women identified a need for more help with household chores and infant care. Women also described a need for more information about PPD and felt most validated in their experience when they shared with another mother with PPD or in a group setting where coping strategies could be discussed. Whereas partners were viewed as important sources of support ($n = 28$), women reported feeling isolated when their partner was working. Family ($n = 33$) and friends ($n = 24$) were identified as important support systems, but some family and friends did not recognize when the woman needed support (Letourneau et al., 2007).

In this study, the women acknowledged that they withdrew from family and friends for varying reasons, such as decreased energy, feelings of worthlessness, and fear of stigmatization. Some women desired more direct assessment of their problem by health care providers and reassurance that they would get better. Half of the women stated they especially felt isolated when a health care provider minimized their symptoms. In-home professional support was the most preferred kind of support, followed by peer support and group support (Letourneau et al., 2007).

Peer Support

Peer support allows nonprofessional individuals to come together, listen to each other, describe similar stresses and feelings, and share insights and coping strategies that a professional may not consider. Peer support comes in many forms, from pairs to groups, and may be carried out face-to-face, over the telephone, or over the Internet.

Pfeiffer, Heisler, Piette, Rogers, and Valenstein (2011) examined seven RCTs ($n = 869$) comparing peer support to psychotherapy on depression scores. The combined results from heterogeneous groups of participants demonstrated that the efficacy of peer support is comparable to psychotherapy. These trials included postpartum and postmenopausal women, mothers of school-age children, HIV-positive men, Stage II cancer patients, and older adult patients recently discharged from a mental health facility. Comparing all participants, there was a greater reduction in depression scores among those who participated in peer support groups. Peer support is an evidence-based treatment option or adjunct to other treatments (Pfeiffer et al., 2011).

In a pilot RCT, Dennis (2003) reported on peer support via telephone contact for women with PPD compared to standard postpartum care. The support was provided by women with previous PPD who had completed a 4-hour training session. The intervention group received emotional, informational, appraisal, or validation support. At the 4-week assessment, 10% of mothers in the experimental group had EPDS scores >12 compared with 40.9% of mothers in the control group. Similarly, at the 8-week assessment, 15% of mothers in the experimental group had EPDS scores >12 compared with 52.4% of mothers in the control group. Among the mothers who received the peer telephone support, 87.5% were satisfied with the intervention (Dennis, 2003).

In a later cross-sectional survey ($n = 701$), women were randomly evaluated to determine whether usual postpartum follow-up care with additional peer support provided by telephone calls after childbirth versus usual postpartum follow-up care (control group) increased perception of support. The majority of women receiving peer telephone follow-up postpartum reported satisfaction (80.5%) as well as emotional (92.7%), informational (72.4%), and appraisal (72.0%) support (Dennis, 2010).

Home-Based Psychosocial Support

An RCT ($n = 181$) was conducted among Australian women to explore intensive social support postpartum. The women in the study were self-identified as having high environmental risk for poor health. The control group received standard community-based health care in the postpartum, whereas support was increased in the intervention group. Postpartum mothers in the intervention group received weekly home visits from midwives or public health nurses from time of institutional discharge until 6 weeks postpartum. The scheduled visits were then every 2 weeks until 12 weeks postpartum, followed by monthly visits until 24 weeks postpartum. Compared to the control group, the intervention group showed significant decreases in postpartum depression screening scores on the EPDS at 6 weeks postpartum.

The intervention group also reported improved experiences with parenting as well as a sense of maintaining self (Armstrong, Fraser, Dadds, & Morris, 1999).

MacArthur et al. (2002) conducted an RCT of 36 general practice clusters composed of 125 general practitioners in the United Kingdom. The purpose of the study was to evaluate the effects of postpartum practices redesigned to identify specific individual needs recognized at the initial postpartum visit. Midwives in the practices provided the care for the participants. The intervention group ($n = 1087$) received an increased number of postpartum visits from the usual until 28 days postpartum, followed by a final visit at 10 to 12 weeks postpartum. The control group ($n = 977$) received standard postpartum care consisting of seven home visits from a midwife between discharge from the hospital and 14 days postpartum with a final exam by a general practitioner at 6 to 8 weeks postpartum. Some women in the control group had a follow-up visit by a home health visitor after 14 days and before the final visit (MacArthur et al., 2002). Women in the intervention group reported feelings of support and improvement in their mental well-being, suggesting that this intervention could lead to a decrease in depression in the first 4 months postpartum (MacArthur et al., 2002).

An outcome evaluation project compared home-based psychosocial support to outpatient psychotherapy in reducing depressive symptoms among postpartum women (Webster, 2009). Postpartum doulas provided all four components of social support—emotional, instrumental or practical information, and appraisal or validation—for a group of postpartum women with depressive symptoms based on an EPDS score ≥9. In this outcomes evaluation of a small, grant-funded program, the EPDS was administered to participants upon enrollment, at the conclusion of the intervention, and at 2 months after completion of the study. EPDS scores for the doula care group mirrored the scores for the psychotherapy group, with a baseline score of 16.20, an end of intervention score of 9.20, and a 2-month postintervention score of 7.80. There was no significant difference between the two groups. In this outcomes evaluation, there was no control group to address the natural remission of depressive symptoms in postpartum women, but there was statistical significance ($p < .001$) in decrease in the three measures over time in both intervention groups (Webster, 2009).

Advantages of the psychosocial support intervention in this study included no attrition, possibly due to reduced barriers with home care and lower cost with the doula care group compared with the psychotherapy group. Study limitations included a small sample size that precluded any distinction of differences between doula care and psychotherapy as well as any meaningful analysis of subgroup characteristics (Webster, 2009). The importance of this study was the demonstration that home-based psychosocial support was equal in effectiveness to psychotherapy, the evidence-based practice that is considered standard of care.

Nutritional Therapy

Nutrition plays a key role in the body's ability to mediate stress. The natural immune system response to stress is the release of proinflammatory cytokines necessary for healing wounds and infections. When chronic, this inflammatory

response is contributory to disorders such as heart disease, diabetes, and depression (Kendall-Tackett, 2009). Pregnancy produces a stress response, and PMAD can further increase the proinflammatory response. Omega-3 fatty acids, specifically eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), help block the proinflammatory response and reduce the stress response (Kendall-Tackett, 2009).

The best sources of EPA and some DHA are fish and fish oils. However, increasing fish consumption can be problematic in pregnant women due to contaminants found in high-fatty acid fish. In 2004, the Federal Drug Administration (FDA) advised pregnant women not to eat more than two fish meals per week. This recommendation was later retracted, with suggestions to consume more fish but cautioning against certain kinds of fish. These public discussions have caused many pregnant women to hesitate about eating fish at all (Jordan, 2010).

Perinatal intake of omega-3s, whether by diet or supplementation, is essential to fetal development and should include 200 to 300 mg DHA plus EPA per day to obtain full benefits. Salmon, sardines, trout, and eggs from chickens fortified with a high-DHA diet are good sources of DHA. Women practicing vegan diets can get DHA from algae supplements. Fish oil supplements have not shown any adverse effects for mother or infants (Jordan, 2010).

Exercise

There is an emerging body of evidence supporting the beneficial effects of exercise in reducing depressive symptoms in postpartum women (Armstrong & Edwards, 2004; Daley, MacArthur, & Winter, 2007; Heh, Huang, Ho, Fu, & Wang, 2008). Although there is a need for larger and well-designed clinical trials, several small studies describe positive findings. In a small ($n = 63$) controlled trial in Taiwan, the researchers' hypothesis was upheld. Women with an EPDS score ≥ 10 at 4 weeks postpartum demonstrated a greater reduction in depressive symptoms at 5 months postpartum after a 3-month exercise support program compared with a similar group receiving treatment as usual (Heh et al., 2008).

Although both groups experienced a significant reduction in mean EPDS scores from preintervention to postintervention ($p = .000$), the exercise support program resulted in a greater decrease in mean EPDS scores ($p = .01$) from 16.5 to 10.2 at 4 weeks and 5 months postpartum, respectively, compared with a smaller decrease in mean EPDS scores in the control group from 16.3 to 12.7 from 4 weeks to 5 months postpartum, respectively (Heh et al., 2008.). Most women participating in the exercise support intervention (28/33) reported that the program was effective and useful. No explanation for the significant reduction in EPDS scores in the control group was offered (Heh et al., 2008). It is unclear whether this reduction was due to natural remission of PPD or to other contributory factors, but the exercise support program was more effective in reducing EPDS scores than standard care over the same period.

Following favorable findings with a pilot study, an Australian RCT was conducted to investigate the impact of a pram-walking intervention for women with PPD (Armstrong & Edwards, 2004). During this 12-week study, women in the intervention group combined exercise in the form of pram-walking with their

babies, social support that occurred during the exercise sessions, and fitness as measured by the maximum volume of oxygen consumption ($\dot{V}O_2$ max). The findings were compared with the control group that held nonstructured, playgroup sessions for mothers and their babies. All participants were in their first year postpartum and scored ≥12 on the EPDS (Armstrong & Edwards, 2004).

As expected, the exercise group increased their fitness scores and decreased their depressive symptoms while both groups increased their perceived levels of social support. The researchers concluded that improvement in fitness level was directly associated with a reduction in EPDS scores for the exercise group, that exercise resulting in an increased $\dot{V}O_2$ max can improve symptoms of depression, and that there were likely other factors contributing to the improvement in depression although none were studied. The trend of reduced depressive symptoms continued through measures at 6 weeks and at the 12-week posttest (Armstrong & Edwards, 2004).

According to these authors, recommendations for exercise programs based on the literature include a minimum of three moderate intensity exercise sessions weekly for 30 to 40 minutes per session, with overall program duration of at least 9 weeks. The program must also be accessible, enjoyable, and realistic in its design for success with new mothers experiencing PPD (Armstrong & Edwards, 2004).

Adequate Sleep

The relationships among maternal fatigue, infant and maternal sleep disruption, and PPD are complex and still poorly understood. In a review of the literature on sleep and perinatal disorders, Ross, Murray, and Steiner (2005) addressed these associations as well as sleep interventions for both prevention and treatment of PMAD. Studies to date have methodological limitations, and evidence exists supporting relationships in both directions; that is, existing PPD possibly resulting in infant sleep disruption as well as infant sleep disruption leading to maternal sleep deprivation and possibly contributing to PPD. The authors concluded that additional research is needed to better define these relationships (Ross et al., 2005).

Even with unclear causal relationships, there is an association between improved infant sleep and reduced maternal depression (Ross et al., 2005). Sleep interventions developed for prevention and treatment of PMAD that address both maternal and infant sleep problems might then be expected to alleviate risk as well as existing illness.

A population-based longitudinal study designed to investigate maternal sleep deprivation as a predictive variable for PPD as it relates to infant sleep patterns reached similar conclusions (Dennis & Ross, 2005). In this study, infant sleep patterns and maternal depressive symptomatology, as measured by the EPDS, were evaluated at 1, 4, and 8 weeks postpartum in 505 Canadian women. Included participants scored <13 on the 1-week EPDS. Results of this study included a strong association among poor infant sleep, maternal fatigue, and an EPDS score indicating a likely major depression (EPDS >12). These mothers reported frequent infant crying, getting less than 6 hours of sleep in 24 hours, and fatigue. At 4 weeks

postpartum, 21 women (4.6%) scored >12 on the EPDS; at 8 weeks postpartum, 20 women (4.7%) scored >12 on the EPDS; and 10 women scored >12 on the EPDS at both measures (Dennis & Ross, 2005). In conclusion, the authors suggest the development of interventions to reduce sleep deprivation in postpartum women as a prevention measure for PPD.

There have been some specific sleep interventions recommended and studied as treatment for PMAD. Ross et al. (2005) reported on a number of early postpartum hospital interventions implemented in the clinical setting with the goal of protecting maternal sleep. These included maternal use of sleep medication to help regulate circadian rhythms, feeding on demand versus on routine, and a hospital stay of up to 5 days postpartum along with rooming-out for mothers at risk of PMAD. Preliminary chart review findings were promising (Ross et al., 2005).

BEST PRACTICES IN NURSE-MIDWIFERY CARE FOR PMAD

Recognizing the occurrence of PMAD is challenging for nurse-midwives. Many women are undiagnosed with PMAD because they do not disclose their symptoms, fearing stigma for having overwhelming feelings of sadness or despair (Beck, 1999). Nurse-midwives are in an ideal position to identify PMAD, provide counseling and health education, and initiate therapeutic measures. This section will discuss best practices for nurse-midwives in recognizing PMAD and supporting women who often suffer alone from this disabling illness.

Legal and Advocacy Frameworks for Best Practice

The American College of Nurse-Midwives' (2003) position statement on depression makes specific reference to postpartum depression and supports universal screening for depression as well as treatment and/or referral as needed for women with identified risk factors. The position statement supports nurse-midwives performing a central role in helping women access community resources and obtain appropriate care for PMAD, and places responsibility on nurse-midwives for recognizing PMAD as a community problem and for implementing an integrated, collaborative response using available community resources.

The postpartum mood disorders position statement by AWHONN (2008) advocates for routine screening protocols and education for staff and patients in all settings where new mothers are likely to present for care, including pediatric settings. This evidence-based position statement emphasizes the urgency of having identification strategies in place, based on the known negative outcomes from delay in treatment. Further, it suggests that screening should begin prenatally. The AWHONN supports legislative efforts and public health initiatives with the goals of increasing awareness of PMAD, accessibility of care, treatment options, and research funding. In agreement with ACNM, AWHONN supports universal screening as a starting point for a perinatal mental health program. As an organization, AWHONN is aligned with the health care reform act and a new multidisciplinary, integrative perinatal mental health care paradigm.

The MOTHERS Act, introduced to Congress in 2001, is legislation focused on perinatal mental health. The basic components of this act were adopted as part of the Patient Protection and Affordable Care Act (PPACA) of 2010. This legislation supports screening, clinical research to develop new treatments, education for health care professionals and the public, and development and enhancement of services for women and their families. In an effort to improve the quality and availability of health care, support services for perinatal mental health care include home-based care and support as well as outpatient care with transportation. With the passage of the Health Care Reform Act, there is now national and legal recognition of the need for improvement in providing perinatal mental health services with an expanded model of care. This model is holistic and integrated, including addressing the impact on the family and providing supportive care (PPACA, 2010).

The Midwifery Model of Care to Promote Mental Health

Nurse-midwives need to assess the risk for PMADs. The midwifery model of care is a collaborative model between the woman and her midwife and is based on trust, continuity of care, ongoing sharing of information, and counseling. The woman's right to self-determination, informed choice, and decision making are central tenets of listening to women (ACNM, 2008). Within this context, best practices include initiating conversation about perinatal mental health, screening every woman for PMAD, providing information about treatment options and community resources, and providing counseling and referral as needed. Best practice involves helping these women to overcome formidable barriers of social stigma, cultural belief systems, logistics of care, and insurance coverage for expensive interventions. Nurse-midwives need to provide leadership in coordinating perinatal mental health services with a multidisciplinary approach to perinatal mental health care. This necessitates development of ongoing relationships with mental health care peers and experts. Coordination with multiple community-based services is essential for continuity of care.

In order to manage the dynamics of her life, a woman with PMAD needs excellent self-care. Education about the benefits of regular exercise and healthy sleep patterns as well as nutrition counseling about adequate intake of omega-3–rich foods are best practices. It is also essential to provide information about all treatment options and referrals to support services. For instance, mom–baby stroller exercise groups may help a woman exercise and get out of the house, and can also decrease PMAD and provide support in a peer group. Other psychosocial support measures such as home-based support, peer counseling with other women who have experienced PMAD, and phone support are options for helping a woman with PMAD to maintain/restore balance in her life.

The midwifery model of care is central to providing evidence-based best practices for women with PMAD, including the full range of both traditional and alternative options. Listening to women has never been more important than it is with women suffering from PMAD.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 8.1

Centering Pregnancy

Time limitation, lack of organized support groups for postpartum moms, and social stigma of diagnosis of perinatal mood and anxiety disorder (PMAD) interfere with prevention or early diagnosis of PMAD. Nurse-midwives can facilitate nonpharmacologic options to prevent or support women with PMAD. Supporting women during the postpartum period may help recognize postpartum depression and offer potential coping mechanisms for prevention and/or management of postpartum depression.

Decreased social support is a consistent risk factor for postpartum depression, and few postpartum support groups exist. A descriptive qualitative postpartum support group pilot study, Mothers Offering Mothers Support (MOMS), was designed by the first author (DK) as part of her doctoral study. The study described the experience of postpartum women attending a support group with women of similar postpartum weeks (Karsnitz, 2008).

The MOMS pilot study used components of the Centering Pregnancy group prenatal care model. A small group of postpartum women ($n = 7$), comparable in postpartum weeks, attended 2-hour group sessions every 2 weeks for a total of 12 weeks (six sessions). The nurse-midwife facilitated sessions on postpartum and newborn education, empowerment, and support.

Initially, sessions began with an educative program and facilitator-led discussion. By Session 2, group members spontaneously began facilitating the educational topics and group discussion. During each session, both group discussion and semistructured interviews were recorded. Group members were also asked to keep a journal and reflect on each session.

DK evaluated the study using content analysis of the focus group discussions, semistructured interviews, and journal reflections. Four themes emerged from the group members' descriptions of their experience in the MOMS pilot study: (a) Sharing Parallel Lives, (b) Sharing Knowledge, (c) Sharing Trust, and (d) Sharing Forward. Sharing was an overarching theme consistent in all categories (Karsnitz, 2008).

Exemplar of Best Practice

Sharing Parallel Lives: *"It's nice to hear that these women are experiencing the same things that I am."*

Sharing Knowledge: *"I learned great ideas to find time for myself."*

Sharing Trust: *"I felt I could be open and say whatever I wanted to and not be judged."*

(continued)

CASE STUDY *(continued)*

Sharing Forward: *"I tried to get help from doctors in the past when I thought I had depression but no one did anything about it. If I had access to a group of this kind, I might not have lost a year of my life."*

The MOMS pilot study exemplifies a nurse-midwife using evidence-based strategies to design a program that may help alleviate the isolation experienced by new mothers and provide education and support during a period when women may experience PMAD. Early recognition and support may help women recognize and seek early treatment for PMAD (Karsnitz, 2008).

REFERENCES

Alwan, E., Reefhuis, J., Rasmussen, S. A., Olney, R. S., & Friedman, J. M. (2007). Use of selective serotonin-reuptake inhibitors in pregnancy and the risk of birth defects. *New England Journal of Medicine*, *356*(26), 2684–2692.

American College of Nurse-Midwives. (2003). *Position statement: Depression in women*. Retrieved from http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000 000061/Depression%20in%20Women%2005.pdf

American College of Nurse-Midwives. (2008). *Code of ethics*. Retrieved from http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000000048/code%20_of_ethics_2008.pdf

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Armstrong, K., & Edwards, H. (2004). The effectiveness of a pram-walking exercise programme in reducing depressive symptomatology for postnatal women. *International Journal of Nursing Practice*, *10*(4), 177–194.

Armstrong, K. L., Fraser, J. A., Dadds, M. R., & Morris, J. (1999). A randomized, controlled trial of nurse home visiting to vulnerable families with newborns. *Journal of Paediatrics and Child Health*, *35*(3), 237–244.

Association of Women's Health, Obstetric and Neonatal Nurses. (2008). *Position statement: The role of the nurse in postpartum mood and anxiety disorders*. Retrieved from http://www.awhonn.org/awhonn/

Beck, C. T. (1993). Teetering on the edge: A substantive theory of postpartum depression. *Nursing Research*, *42*(1), 42–48.

Beck, C. T. (1995). The effects of postpartum depression on maternal-infant interaction: A meta-analysis. *Nursing Research*, *44*(5), 298–304.

Beck, C. T. (1998). The effects of postpartum depression on child development: A meta-analysis. *Archives of Psychiatric Nursing*, *12*(1), 12–20.

Beck, C. T. (1999). Postpartum depression: Stopping the thief that steals motherhood. *AWHONN Lifelines*, *3*(5), 41–44.

Beck, C. T. (2006). The anniversary of birth trauma: Failure to rescue. *Nursing Research*, *55*(6), 381–390.

Beck, C. T., & Indman, P. (2005). The many faces of postpartum depression. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *34*(5), 569–576.

Boath, E., Bradley, E., & Henshaw, C. (2004). Women's views of antidepressants in the treatment of postnatal depression. *Journal of Psychosomatic Obstetrics and Gynecology*, *25*(3–4), 221–233.

Centre for Maternal and Child Enquiries. (2011). Saving mothers' lives: Reviewing maternal deaths to make motherhood safer: 2006–2008. The Eighth Report on Confidential Enquiries into Maternal Deaths in the United Kingdom. *BJOG*, *118*(Suppl. 1), 1–203. doi:10.1111/j.1471-0528.2010.02847.x

Cox, J. L., & Holden, J. (2003). *Perinatal mental health: A guide to the Edinburgh Postnatal Depression Scale*. Glasgow, United Kingdom: The Royal College of Psychiatrists.

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, *150*, 782–786.

Daley, A. J., MacArthur, C., & Winter, H. (2007). The role of exercise in treating postpartum depression: A review of the literature. *Journal of Midwifery & Women's Health*, *52*(1), 56–62.

Delatte, R., Cao, H., Meltzer-Brody, S., & Menard, K. (2009). Universal screening for postpartum depression: An inquiry into provider attitudes and practice. *American Journal of Obstetrics & Gynecology*, *200*(5), e63–e64.

Dennis, C. L. (2003). The effect of peer support on postpartum depression: A pilot randomized controlled trial. *Canadian Journal of Psychiatry*, *48*(2), 115–124.

Dennis, C. L. (2010). Postpartum depression peer support: Maternal perceptions from a randomized controlled trial. *International Journal of Nursing Studies*, *47*(5), 560–568.

Dennis, C. L., & Chung-Lee, L. (2006). Postpartum depression help-seeking barriers and maternal treatment preferences: A qualitative systematic review. *Birth*, *33*(4), 323–331.

Dennis, C. L., & Hodnett, E. (2007). Psychosocial and psychological interventions for treating postpartum depression. *Cochrane Database of Systematic Reviews*, (4), CD006116. doi:10.1002/14651858.CD006116.pub2

Dennis, C. L., & Ross, L. (2005). Relationships among infant sleep patterns, maternal fatigue, and development of depressive symptomatology. *Birth*, *32*(3), 187–193.

Evins, G. G., Theofrastous, J. P., & Galvin, S. L. (2000). Postpartum depression: A comparison of screening and routine clinical evaluation. *American Journal of Obstetrics and Gynecology*, *182*(5), 1080–1082.

Gangdev, P. (2002). The relationship between obsessive-compulsive disorder and psychosis. *Australasian Psychiatry*, *10*(4), 405–410.

Gaynes, B. N., Gavin, N., Meltzer-Brody, S., Lohr, K. N., Swinson, T., Gartlehner, G., . . . Miller, W. C. (2005). *Perinatal depression: Prevalence, screening accuracy, and screening outcomes summary* (Evidence Report/Technology Assessment No. 119, AHRQ Publication No. 05-E006-2). Rockville, MD: Government Printing Office.

Gibson, J., McKenzie-McHarg, K., Shakespeare, J., Price, J., & Gray, R. (2009). A systematic review of studies validating the Edinburgh Postnatal Depression Scale in antepartum and postpartum women. *Acta Psychiatrica Scandinavica*, *119*(5), 350–364.

Goodman, J. H., & Tyer-Viola, L. (2010). Detection, treatment, and referral of perinatal depression and anxiety by obstetrical providers. *Journal of Women's Health*, *19*(3), 477–490.

Hackley, B. (2010). Antidepressant medication use in pregnancy. *Journal of Midwifery & Women's Health*, *55*(2), 90–100.

Halbreich, U., & Karkun, S. (2006). Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. *Journal of Affective Disorders*, *91*(2–3), 97–111.

Hanna, B., Jarman, H., Savage, S., & Layton, K. (2004). The early detection of postpartum depression: Midwives and nurses trial a checklist. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *33*(2), 191–197.

Hay, D. F., Pawlby, S., Angold, A., Harold, G. T., & Sharp, D. (2003). Pathways to violence in the children of mothers who were depressed postpartum. *Developmental Psychology*, *39*(6), 1083–1094.

Heh, S., Huang, L., Ho, S., Fu, Y., & Wang, L. (2008). Effectiveness of an exercise support program in reducing the severity of postnatal depression in Taiwanese women. *Birth*, *35*(1), 60–65.

Horowitz, J. A., & Goodman, J. H. (2005). Identifying and treating postpartum depression. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *34*(2), 264–273.

Jordan, R. G. (2010). Prenatal omega-3 fatty acids: Review and recommendations. *Journal of Midwifery and Women's Health*, *55*, 520–528.

Karsnitz, D. B. (2008). *Mothers offering mothers support (MOMS): A pilot study intervention to increase social support and decrease depression in postpartum women*. Unpublished manuscript, College of Nursing, University of Kentucky, Lexington, KY.

Karsnitz, D. B., & Ward, S. (2011). Spectrum of anxiety disorders: Diagnosis and pharmacologic treatment. *Journal of Midwifery and Women's Health*, *56*(3), 266–281. doi:10.1111/j.1542-2011.2011.00045.x

Katon, W. J. (2006). Clinical practice. Panic disorder. *New England Journal of Medicine*, *354*(22), 2360–2367.

Kendall-Tackett, K. A., & Hale, T. W. (2009). Medication use for trauma symptoms and PTSD in pregnant and breastfeeding women. *Trauma Psychology Newsletter*, *4*(2), 12–15.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*(6), 593–602.

Letourneau, N., Duffett-Leger, L., Stewart, M., Hegadoren, K., Dennis, C. L., Rinaldi, C. M., & Stoppard, J. (2007). Canadian mothers' perceived support needs during postpartum depression. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *36*(5), 441–449.

Loveland Cook, C. A., Flick, L. H., Homan, S. M., Campbell, C., McSweeney, M., & Gallagher, M. E. (2004). Posttraumatic stress disorder in pregnancy: Prevalence, risk factors, and treatment. *Obstetrics and Gynecology*, *103*(4), 710–717. doi:10.1097/01.AOG.0000119222.40241.fb

MacArthur, C., Winter, H. R., Bick, D. E., Knowles, H., Lilford, R., Henderson, C., . . . Gee, H. (2002). Effects of redesigned community postnatal care on women's health 4 months after birth: A cluster randomized controlled trial. *The Lancet*, *359*(9304), 378–385.

McQueen, K., Montgomery, P., Lappan-Gracon, S., Evans, M., & Hunter, J. (2008). Evidence-based recommendations for depressive symptoms in postpartum women. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *37*(2), 127–136.

Mulcahy, R., Reay, R. E., Wilkinson, R. B., & Owen, C. (2010). A randomised control trial for the effectiveness of group interpersonal psychotherapy for postnatal depression. *Archives of Women's Mental Health*, *13*(2), 125–139.

Murray, L., Arteche, A., Fearon, P., Halligan, S., Goodyer, I., & Cooper, P. (2011). Maternal postnatal depression and the development of depression in offspring up to

16 years of age. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*(5), 460–470.

National Institute of Mental Health. (2010). *Statistics*. Retrieved from http://www.nimh.nih.gov/statistics/index.shtml

Olatunji, B. O., Cisler, J. M., & Deacon, B. J. (2010). Efficacy of cognitive behavioral therapy for anxiety disorders: A review of meta-analytic findings. *Psychiatric Clinics of North America*, *33*(3), 557–577.

Patient Protection and Affordable Care Act, Pub. L. No. 111-148, § 2952, Stat. 344–346 (2010). *Support, education, and research for postpartum depression*. Retrieved from http://www.gpo.gov/fdsys/pkg/PLAW-111publ148/content-detail.html

Pfeiffer, P. N., Heisler, M., Piette, J. D., Rogers, M. A., & Valenstein, M. (2011). Efficacy of peer support interventions for depression: A meta-analysis. *General Hospital Psychiatry*, *33*(1), 29–36.

Ross, L. E., & McLean, L. M. (2006). Anxiety disorders during pregnancy and the postpartum period: A systematic review. *Journal of Clinical Psychiatry*, *67*(8), 1285–1298.

Ross, L. E., Murray, B. J., & Steiner, M. (2005). Sleep and perinatal mood disorders: A critical review. *Journal of Psychiatry & Neuroscience*, *30*(4), 247–256.

Roy-Byrne, P. P., Davidson, K. W., Kessler R. C., Asmundson, G. J., Goodwin, R. D., Kubzansky, L., . . . Stein, M. B. (2008). Anxiety disorders and comorbid medical illness. *General Hospital Psychiatry*, *30*(3), 208–225.

Sit, D., Rothschild, A. J., & Wisner, K. L. (2006). A review of postpartum psychosis. *Journal of Women's Health*, *15*(4), 352–368.

Sobey, W. S. (2002). Barriers to postpartum depression prevention and treatment: A policy analysis. *Journal of Midwifery and Women's Health*, *47*(5), 331–336.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, *166*(10), 1092–1097.

Stahl, S. M. (2008). *Stahl's essential psychopharmacology online*. Retrieved from http://stahlonline.cambridge.org/essential_toc.jsf

Ströhle, A., & Holsboer, F. (2003). Stress responsive neurohormones in depression and anxiety. *Pharmacopsychiatry*, *36*(Suppl. 3), S207–S214.

Uguz, F., Gezginc, K., Zeytinci, I. E., Karatayli, S., Askin, R., Guler, O., . . . Gecici, O. (2007). Obsessive-compulsive disorder in pregnant women during the third trimester of pregnancy. *Comprehensive Psychiatry*, *48*(5), 441–445.

van Batenburg-Eddes, T., de Groot, L., Steegers, E. A., Hofman, A., Jaddoe V. W., Verhulst, F. C., & Tiemeier, H. (2010). Fetal programming of infant neuromotor development: The generation R study. *Pediatric Research*, *67*(2), 132–137.

Webster, N. (2009). *Evaluation of a home-based psychosocial support intervention for symptoms of postpartum depression*. Unpublished manuscript, College of Nursing and Health Innovation, Arizona State University, Phoenix, AZ.

Zender, R., & Olshansky, E. (2009). Women's mental health: Depression and anxiety. *Nursing Clinics of North America*, *44*(3), 355–364.

III

The Intrapartal Period: The Conflict of Evidence and Practice

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Management of Prelabor Rupture of the Membranes at Term: Using the Evidence

9

Amy Marowitz

PROM AT TERM: RISK FOR MATERNAL AND INFANT INFECTION

Prelabor rupture of the membranes (PROM) at term is defined as spontaneous rupture of the amniotic membranes prior to the onset of labor in a term gestation. This situation is encountered regularly by nurse-midwives because PROM occurs in about 8% to 10% of term pregnancies (Gunn, Mishell, & Morton, 1970). PROM is a well-established risk factor for maternal and neonatal infection (Seaward et al., 1997; Seaward et al., 1998; Soper, Mayhall, & Froggatt, 1996).

Interventions to hasten birth are often employed when PROM occurs in an effort to lessen the risk of infection. However, the duration of rupture is not the only risk factor, and multiple variables may interact in a synergistic fashion to result in infection. The amniotic membranes are no longer considered an impenetrable barrier. In fact, preexisting infection may be the cause of some prelabor ruptures (American College of Obstetricians and Gynecologists [ACOG], 2007).

One of the primary management decisions to be made with term PROM is choosing between expectant management (waiting for spontaneous onset of labor) and induction of labor. Although approximately 60% of women with term PROM will begin labor spontaneously within 24 hours of rupture (Gunn et al., 1970), expectant management of term PROM is an uncommon management approach today. However, it is a reasonable option that should be presented to the woman along with the option of labor induction.

The Evidence on Management of Term PROM

Early research from the 1950s and 1960s showed a significantly higher perinatal mortality when the membranes rupture before the onset of labor and increasing mortality with increasing duration of rupture (Burchell, 1964; Calkins, 1952; Lanier, Scarbrough, Fillingim, & Baker, 1965). Some studies showed a much higher perinatal mortality when the membranes were ruptured more than 24 hours before

birth (Calkins, 1952; Lanier et al., 1965; Taylor, Morgan, Bruns, & Drose, 1961). These findings prompted concern about duration of rupture as the greatest risk for infection, resulting in recommendations for aggressive management to hasten birth by inducing labor shortly after rupture of membranes. A number of authors writing at this time recommended ensuring birth by 24 hours post-rupture, even if a cesarean birth was required (Lanier et al., 1965; Webster, 1969).

The following excerpt from the classic article by Shubeck et al. (1966) summarizes the prevailing view from this era:

> With rupture of membranes, the clock of infection starts to tick; from this point on isolation and protection of the fetus from external microorganisms virtually ceases. Indeed, it is now being suggested that the likelihood of survival of the offspring is reduced in proportion to the time it is permitted to remain within the uterus after the membranes have been breached. Fetal mortality, largely due to infection, increases with the time from rupture of membranes to the onset of labor. (p. 22)

Because these studies were conducted, many methodological flaws have been identified in the early research. The studies were retrospective in nature and based on chart reviews or, in the case of Shubeck et al. (1966), analysis of one large data bank, the Collaborative Project. Management aspects of labor that could impact infection risk such as repeated vaginal exams were not addressed in these early studies. Antibiotic therapy for anaerobic organisms, the common pathogens responsible for intrapartum infection, was not used at the time. Thus, maternal and neonatal outcomes in the presence of infection were poor as compared today. In one of these early studies, the perinatal mortality rate following infection was reported at 50% (Lanier et al., 1965).

Another problem with the early studies was that the outcomes of preterm PROM and term PROM were not considered separately. The risks of fetal and neonatal infection and associated mortality markedly increase with preterm delivery accompanied by PROM (ACOG, 2007). Despite problems with these early studies, the recommendation for aggressive intervention following PROM was readily accepted by many providers and continues today.

In the 1970s and 1980s, concern mounted regarding the high rate of cesarean birth that resulted from aggressive management (Conway, Prendiville, Morris, Speller, & Stirrat, 1984; Duff, Huff, & Gibbs, 1984; Kappy et al., 1982). Research on PROM management focused on comparing induction with expectant management. Many of these studies showed similar perinatal mortality and maternal and neonatal complications with both options, but a higher cesarean birth rate with routine induction (Conway et al., 1984; Duff et al., 1984; Kappy et al., 1982).

The TERMPROM Study

Identifying evidence-based best practice was limited by the methodology of these earlier studies. Most of the studies were not randomized and had relatively small numbers. There was limited homogeneity among the studies in the definition of expectant management, how induction was operationalized, and the criteria used to diagnose infection. These methodological issues prompted standardizing

definitions as well as the implementation of a large randomized trial to compare induction and expectant management of term PROM.

The Term Prelabor Rupture of the Membranes (TERMPROM) study was a multicenter, multinational trial in which 5041 women with term PROM were randomly assigned to one of four groups:

- Immediate induction with oxytocin;
- Immediate induction with prostaglandin E_2 (PGE_2);
- Expectant management up to 4 days followed by induction with oxytocin, if labor did not begin spontaneously in this time frame; and
- Expectant management up to 4 days followed by PGE_2, if labor did not begin spontaneously in this time frame (Hannah et al., 1996).

The 4-day limit for expectant management was determined arbitrarily, based on the investigators' assumption that few women would be willing to wait longer than 4 days for the spontaneous onset of labor (Hannah et al., 1996).

The primary outcomes examined were rates of maternal and neonatal infection and cesarean birth rates. There was no difference in rates of neonatal infection or cesarean birth between the expectant management and the induction groups, with a lower rate of maternal infection in the induction with the oxytocin group (4% as compared to 8% in the expectant management group). The rate of maternal infection for the induction with prostaglandins group was slightly higher than for the induction with oxytocin group (6.2%; Hannah et al., 1996).

The Cochrane Collaboration completed a systematic review of term PROM management (Dare, Middleton, Crowther, Flenady, & Varatharaju, 2006). The findings of this review closely mirror those of the TERMPROM study, which is not surprising considering that the TERMPROM study was the largest of 12 trials reviewed accounting for 5041 of almost 7000 total participants. The other 11 studies had between 59 and 566 participants. The majority of the studies in the Cochrane review allowed for only 24 hours of expectant management. Thus, the TERMPROM study is of considerable importance due to its large size, randomized design, and longer expectant management time frame.

Limitations of the TERMPROM Study

The importance of this study within the current body of literature on term PROM management has resulted in close scrutiny, revealing several limitations and questions about the finding of increased risk of maternal infection with expectant management. Limitations include potential overdiagnosis of chorioamnionitis, vaginal exams as an independent risk factor for infection, and the vaginal presence of Group B streptococcus (GBS).

Potential Overdiagnosis of Chorioamnionitis

Accurate and timely diagnosis of chorioamnionitis can be difficult. The diagnosis is often made in labor without definitive evidence. The signs and symptoms are nonspecific or subjective. For instance, fever, as evidence of chorioamnionitis,

can result from a multitude of processes, such as other infections or epidural analgesia. Foul-smelling fluid may be a subjective assessment. It may be difficult to distinguish between abdominal tenderness from infection and the normal sensations of labor contractions. The accuracy of diagnosis is increased if based on two or more clinical criteria. These criteria generally include fever and one other clinical indicator, such as abdominal tenderness, foul-smelling fluid, elevated white blood cell (WBC) count, or maternal or fetal tachycardia (Tita & Andrews, 2010).

In the TERMPROM study, the diagnosis of chorioamnionitis was based on the presence of one of the following criteria:

- Fever before or during labor, defined as a temperature of >37.5 °C (99.5 °F) on two occasions ≥1 hour apart, or one temperature of 38 °C (100.4 °F);
- WBC count of >20,000; or
- Foul-smelling amniotic fluid (Hannah et al., 1996).

More typically, fever was defined as two temperature readings of minimally 38 °C (100.4 °F) at least 1 hour apart (Hannah et al., 1996). This criterion for fever, in combination with the use of only one other criterion, may have resulted in an overdiagnosis of chorioamnionitis in the TERMPROM study.

Vaginal Exams: An Independent Risk Factor for Infection

Regardless of duration of ruptured membranes or duration of labor, the greater the number of vaginal exams, the higher the risk of infection. This finding is well supported by epidemiological studies examining risk factors for chorioamnionitis (Newton, Prihoda, & Gibbs, 1989; Soper, Mayhall, & Dalton, 1989; Soper et al., 1996). In one such study, Soper et al. (1989) noted that the risk of chorioamnionitis with ruptured membranes was 3% with two vaginal exams and 63% after eight vaginal exams. In the TERMPROM study, women in the expectant management groups had significantly more vaginal exams than women in the induction groups (Hannah et al., 1996).

Secondary analysis of data from the TERMPROM study on the predictors of chorioamnionitis supports this finding (Seaward et al., 1997). The authors examined a number of factors, including duration of rupture of membranes, duration of labor, time from membrane rupture to active labor, and GBS colonization status. They found that the number of vaginal exams was the most important factor in predicting both chorioamnionitis and postpartum endometritis. In this study, the risk of chorioamnionitis was 2%, with fewer than three vaginal exams and 20% after eight or more vaginal exams. The risk gradually increased as the number of exams rose from three to eight (Seaward et al., 1997).

In addition to the number of vaginal exams, elapsed time between the first exam and birth is also significant in terms of infection risk (Schutte, Treffers, Kloosterman, & Soepatmi, 1983). In the TERMPROM study, most women had a vaginal exam upon admission to the study (Hannah, 1996). This is likely to have had a greater impact on subsequent infection among the expectant management groups because these women had a longer interval between admission and birth than those in the

induction groups. In their secondary analysis, Seaward et al. (1997) found that the duration of the latency period (time from rupture of membranes to onset of labor) had little effect on development of infection when few vaginal exams were done.

Group B Streptococcus

Maternal GBS colonization is a known risk factor for both maternal and neonatal infection (Centers for Disease Control and Prevention [CDC], 2002). The TERMPROM study was completed prior to the current CDC guidelines for universal screening for GBS during pregnancy and intrapartum prophylaxis with antibiotics for GBS-positive women. However, in the TERMPROM study, all women had a GBS culture upon entry to the study, allowing for analysis of this factor on outcome.

Most culture results were not available before birth, and most GBS-positive women did not receive intrapartum antibiotic prophylaxis (Hannah et al., 1997). Although this factor potentially affected women who were induced or managed expectantly, GBS colonization may have had a greater impact on the expectant management groups due to longer duration of rupture and greater number of vaginal exams.

In secondary analyses of the TERMPROM study data, the influence of maternal GBS status on infection risk was examined (Hannah et al., 1997; Seaward et al., 1997; Seaward et al., 1998). In these analyses, the authors found maternal GBS colonization to be a risk factor for chorioamnionitis, postpartum endometritis, and neonatal infection (Seaward et al., 1997; Seaward et al., 1998).

Expert Statements on the Management of Term PROM

Many clinicians use recommendations from professional organizations to help guide management decisions. Organizations providing recommendations for intrapartum care include the ACOG, the American College of Nurse-Midwives (ACNM), and, in Canada, the Association of Ontario Midwives (AOM). An examination of the discrepancies in the recommendations from these organizations is instructive in understanding some of the controversies related to the management of term PROM.

ACOG has published two practice bulletins on management of term PROM since the TERMPROM study was published. Each bulletin briefly addresses the issue of term PROM and then evaluates induction versus expectant management. The recommendations in these two bulletins differ, even though the TERMPROM study was used as the primary reference for both. In the ACOG Practice Bulletin Number 1 (1998), the authors state,

> Risk of Cesarean delivery and risk of neonatal infectious complications do not appear to depend on the mode of management (expectant versus induction), although the risks of maternal infection may increase with expectant management. . . . Thus, it is reasonable for consideration of patient's wishes and hospitalization costs to influence management. With term PROM, labor may be induced at the time of presentation or patients may be observed for up to 24-72 hours. (p. 81)

In contrast, the 2007 ACOG Practice Bulletin Number 80 stated, "For women with PROM at term, labor should be induced at the time of presentation, generally with oxytocin infusion, to reduce the risk of chorioamnionitis" (p. 1014). The 2007 ACOG Practice Bulletin did not include a rationale for the change in management recommendations. One author (Fahey, 2008) theorized that this change was based on newer evidence demonstrating the association between chorioamnionitis and increased risk of cerebral palsy. In addition, there has been an increase in the rates of elective induction and, presumably, greater acceptance of induction in general in the intervening years (Fahey, 2008).

In 2008, the ACNM published a position statement on the management of PROM at term. The authors stated, "There was a higher incidence of uterine infection in the expectant management arm of (the TERMPROM) trial. However . . . the study had several important limitations that affected the incidence of maternal infection" (p. 1).

The ACNM recommended that women be informed of the risks and benefits of management options and choose between expectant management and induction if certain conditions are met. These conditions include,

> A term uncomplicated, singleton, vertex pregnancy with clear amniotic fluid; absence of identified infection including GBS, Hepatitis B & C, HIV; absence of fever and no evidence of significant risk for fetal acidemia in the fetal heart rate and fetal heart rate pattern. (p. 2)

The AOM's clinical practice guideline on management of term PROM was published in 2010. The authors recommend that midwives "offer clients with PROM >37 weeks' gestation the option of induction or expectant management. In the absence of abnormal findings . . . expectant management is as appropriate as induction of labor" (p. 10).

These organizations have used the same literature to arrive at different conclusions regarding the management of term PROM. It is noteworthy that the authors of the TERMPROM study state, "Induction of labor . . . and expectant management are reasonable options for women and their babies if membranes rupture before the start of labor at term" (Hannah et al., 1996, p. 1010).

BEST PRACTICES IN THE MANAGEMENT OF TERM PROM

Expectant Management

There is minimal current literature addressing best practices for expectant management of term PROM. Incorporating a protocol into a nurse-midwifery practice for expectant management with term PROM is challenging. Successful implementation begins with advanced planning and discussion with medical and nursing colleagues. This discussion needs to include

- current evidence and recommendations of professional organizations;
- the philosophy of shared decision making with the woman and her family in the nurse-midwifery model of care;
- the feasibility of awaiting labor in the hospital;

- the critical importance of minimizing vaginal exams, including avoiding a baseline exam on arrival when a woman has PROM and is not in active labor;
- the content and timing of education with the woman and her family; and
- the process of informed consent and informed refusal.

Consultation with pediatricians is also an important discussion point. Some pediatric providers routinely perform partial or full septic workups on neonates based on duration of maternal rupture of membranes. If a discussion of the evidence with colleagues does not result in a change of this practice, then explanation of this policy should be included in the discussion with the woman and her family. This practice, if routine and required in a hospital birth, may influence the woman's decision related to induction versus expectant management or her decision on how long to continue expectant management.

Expectant Management With GBS-Positive Women

The TERMPROM study took place prior to the current policy of routine antepartum GBS screening and intrapartum antibiotic prophylaxis for GBS-positive women. Most GBS-positive women in the TERMPROM study did not receive antibiotics (Hannah et al., 1997). It is not known how the administration of prophylactic antibiotics to GBS-positive women once membranes have ruptured, as recommended by the CDC (2002), would have impacted outcomes in the TERMPROM study.

However, based on the evidence described earlier, the ACNM (2008b) recommends against offering GBS-positive women the option of expectant management. The AOM takes a different stance, citing lack of evidence on best practice for either induction or expectant management, given current policies related to GBS screening and prophylaxis. The organization recommends offering either induction or expectant management for an 18-hour duration (AOM, 2010). This time frame is based on research indicating a sharp increase in risk of early onset GBS infection of the newborn when membranes have been ruptured for 18 hours or more (Benitz, Gould, & Druzin, 1999). However, the limitation of using this research as the basis of best practice is that it included women with rupture of membranes before and after the onset of labor and before established policies on routine culture and treatment of GBS-positive women.

What can be concluded with certainty is that in the presence of term PROM, GBS colonization without intrapartum antibiotic prophylaxis is a risk factor for both maternal and neonatal infection. The CDC (2002) identifies antibiotic prophylaxis with the rupture of membranes among GBS-positive women as best practice. Therefore, regardless of the plan for induction or expectant management, nurse-midwives should advise GBS-positive women with term PROM of this CDC recommendation.

Expectant Management and Vaginal Exams

The ACNM, ACOG, and AOM are in agreement that there is strong and consistent evidence identifying vaginal exams as a risk for infection (ACNM, 2008b; ACOG, 2007; AOM, 2010). In the TERMPROM secondary analysis, the number

of vaginal exams was the risk factor most strongly predictive of infection, showing increasing risk directly related to increasing number of exams (Seaward et al., 1997). The elapsed time between the first vaginal exam and time of birth may be a factor as well (Schutte et al., 1983).

The ACNM (2008b) identifies minimizing vaginal exams and avoiding vaginal exam at baseline as best practice during expectant management. The ACOG (2007) states, "Digital cervical examinations should be avoided in patients with PROM unless they are in active labor or imminent delivery is anticipated" (p. 1009). The AOM (2010) provides explicit guidance regarding use of vaginal exams, advising that best practice includes avoiding vaginal exams with PROM as much as possible "until active labour or upon induction of labour" (p. 10).

Avoidance of vaginal exams prior to labor and judicious use of vaginal exams once labor has begun are best practices. The gradual physiologic changes of latent labor are a necessary prelude for active labor. Allowance for this normal latent phase of labor is critical. Unless there are signs of infection, all women should be allowed adequate time to progress in labor, regardless of membrane status. Overconcern about labor progress with PROM can lead to more vaginal exams than necessary, inadvertently increasing risk of infection.

Expectant Management in Out-of-Hospital Settings

One management decision is whether the woman should await labor at home or in the hospital or birth center. In the TERMPROM study, women in the expectant management group were not randomized by location (home or hospital; Hannah et al., 1996).

The AOM's practice bulletin on PROM recommends that women remain at home for the latency period because there is lack of need for hospitalization during this time (2010, p. 17). It may be impractical or impossible for women to await the onset of labor in the hospital during longer latency periods, especially in busy units with space and staffing challenges. It may be reasonable for women choosing expectant management to stay at home because there is lack of good evidence on the safest location for expectant management and an absence of a physiologic explanation for an increased risk of infection with expectant management at home.

Monitoring maternal and fetal well-being during the latency period, especially in the out-of-hospital setting, is another consideration. In studies on expectant management, type and frequency of monitoring varied considerably, with frequencies from every 4 hours to once a day (Duff et al., 1984; Hannah et al., 1996; Kappy et al., 1982). Because there are no outcome studies with different protocols for monitoring, decisions are based on clinical judgment and conventional practices. A thorough evaluation includes vital signs, fetal heart tones, complete blood count (CBC), assessment of color and odor of amniotic fluid, and maternal coping, including hydration, nutritional status, degree of fatigue, emotional status, and adequacy of family support. The AOM's (2010) clinical practice guideline on management of term PROM recommends a complete daily assessment. Location of expectant management may influence monitoring frequency because hospital policies may require specific intervals.

Expectant management of term PROM in out-of-hospital settings requires unique considerations. Women seeking out-of-hospital birth may be particularly interested in expectant management of term PROM. For these women, choosing induction of labor usually means changing the intended place of birth. In the United States, nurse-midwives attending births in the home or birth center follow protocols requiring transfer to hospital care if active labor has not begun within 24 hours of rupture. Under this circumstance, women may feel pressured to stimulate labor with castor oil or nipple stimulation in an attempt to avoid going to the hospital. Nurse-midwives may also feel pressured to be overly vigilant in monitoring labor progress, performing more vaginal exams than usual and inadvertently contributing to the risk of increased infection.

Expectant management for up to 96 hours (4 days) in the absence of signs of infection or other complications is a reasonable best practice for women in the out-of-hospital setting. Most women will begin labor within this period. For those who do not, transfer to the hospital for induction with oxytocin would parallel the protocols in the TERMPROM study.

There are some small studies supporting the efficacy of castor oil (Davis, 1984) and nipple stimulation (Curtis, Resnick, Evens, & Thompson, 1999) in inducing labor with term PROM. The advantage of these approaches is that they do not necessarily require hospital transfer. However, there is no evidence to guide decisions on whether or not these measures should be substituted for oxytocin induction after 96 hours of rupture, or if it is best practice to use them earlier to reduce the need for oxytocin. In addition, it is unknown whether the risk of infection is impacted by the use of either intervention in addition to, or as a substitute for, oxytocin induction.

A best practice in this situation requires that the nurse-midwife has clear and detailed discussions with the woman and her family about potential risks and benefits of all options. It is important to anticipate the repercussions of different decisions in terms of the number of vaginal exams and maternal well-being. If transfer to the hospital for oxytocin induction is required at 96 hours post-rupture or earlier, it is optimal for the woman to be well rested, hydrated, nourished, and to have had minimal or no vaginal exams.

Induction of Labor

Prelabor rupture of membranes is a legitimate indication for induction. Many women will choose this option for a variety of reasons. After the decision between expectant management and induction is made, there are other issues to consider in providing best practices.

Induction and Vaginal Exams

A priority with induction is for the nurse-midwife to minimize vaginal exams in order to reduce the risk of infection following PROM. The nurse-midwife must allow for the normal latent phase and use reasonable and judicious parameters in evaluating active labor progress. Best practice includes performing vaginal exams only if the information gleaned would change the management of the labor.

Induction and Prostaglandins

Another issue related to induction for PROM is the use of prostaglandins for the woman with an unripe cervix. In the TERMPROM study, women randomized to the induction with the prostaglandin group had a slightly higher rate of chorioamnionitis than those in the induction with oxytocin group. There was no difference in the cesarean birth rate (Hannah et al., 1996). However, use of prostaglandins was not based on cervical ripeness. Therefore, this study does not address the benefits of using prostaglandins for the woman with PROM who also has an unripe cervix. Misoprostol (Cytotec) is a prostaglandin preparation available since the TERMPROM study was completed. In a 2005 meta-analysis, misoprostol was found to be comparable to oxytocin in terms of rates of maternal and neonatal complications as an induction agent for term PROM (Lin, Nuthalapaty, Carver, Case, & Ramsey, 2005).

The Right of Decision as Best Practice

The difference in the recommendations for term PROM in current practice bulletins suggests philosophical differences between professions. The ACNM (2008b) addresses this directly in its bulletin stating,

> Consistent with the philosophy of the American College of Nurse Midwives that women have a right to self determination in their care, it is [our position] that women receive counseling and informed consent about the risks and benefits of management options of PROM at term and be allowed to select expectant management as a safe alternative to induction. (p. 3)

No one management approach is right for all women and in all situations. The goal of nurse-midwifery management with term PROM should be minimizing infection risk within the framework of the midwifery model of care and the woman's preferred care options.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 9.1

Management of PROM at Term: Using the Evidence for Best Practice

Rachel, a 31-year-old gravida 1 para 0, started care in a nurse-midwifery practice in the first trimester. Her pregnancy was normal with a negative Group B streptococcus (GBS) culture at 37 weeks. At 39 weeks and 5 days, Rachel called the nurse-midwife at 9:30 a.m., stating she had just experienced a large gush of fluid and was leaking a moderate amount of clear fluid. She arrived at the

(continued)

CASE STUDY *(continued)*

hospital birthing unit at 11 a.m. Maternal vital signs and fetal heart rate were normal, the baby was cephalic by external examination, and a speculum exam revealed nitrazine positive, clear fluid, and a closed cervix. Rachel was not having contractions.

Rachel was educated briefly about term prelabor rupture of the membranes (PROM) during prenatal education. The nurse-midwife now discussed potential risks and benefits of expectant management and induction. Rachel decided on expectant management. The nurse-midwife offered the options of staying at home or in the antepartum unit. Rachel chose to go home. A complete blood count (CBC) was done and the nurse-midwife did discharge teaching, including nothing per vagina, rest, hydration, nourishment, and taking her temperature every 4 hours while awake. Rachel was instructed to contact the nurse-midwife if she had a temperature more than 99.5 °F, meconium in the amniotic fluid, decreased fetal movement, bleeding more than spotting, or the onset of regular, strong contractions. She was instructed to return the next morning and that she could request an induction at any time.

The next morning, Rachel returned to the hospital at 9 a.m. She slept most of the night and awakened at 6 a.m. with mild contractions every 8 to 10 minutes. She was drinking, eating, voiding without difficulty, and coping well with contractions. She continued to leak small amounts of clear fluid. Vital signs, white blood cell (WBC) count, and fetal heart rate were normal. Vaginal exam was deferred. The nurse-midwife reviewed coping with the latent phase and encouraged delaying admission until active labor. Rachel agreed with this plan, returning to the hospital at 6 p.m. with moderate-to-strong contractions every 3 to 4 minutes. All parameters were normal. A vaginal exam revealed Rachel was 4-cm dilated, 100% effaced, 0 station, clear fluid, and cephalic presentation. The contractions were becoming progressively closer and stronger, and all parameters remained normal. The nurse-midwife deferred vaginal exams, observing contraction pattern and maternal discomfort as signs of progressive labor. At midnight, Rachel experienced increasing vaginal and rectal pressure. Vaginal exam revealed 9-cm dilation, 100% effaced, and +1 station. At 3:00 a.m., Rachel had a strong urge to push and gave birth to a 7 lbs. 2 oz. girl, with Apgar scores of 8 and 9.

Exemplar of Best Practice

This case study exemplifies evidence-based best practice for term PROM. Rachel was screened for GBS during pregnancy, educated briefly on term PROM during prenatal care, given options, and allowed to choose between induction and expectant management when term PROM occurred. Infection risk was reduced by deferring vaginal exam until active labor and minimizing vaginal exams during active labor.

REFERENCES

American College of Nurse-Midwives. (2008a). *Core competencies for basic midwifery practice*. Retrieved from www.midwife.org/index.asp?bid=59&cat=3&button=Search&rec=233

American College of Nurse-Midwives. (2008b). *Premature rupture of membranes (PROM) at term*. Retrieved from www.midwife.org/index.asp?bid=59&cat=3&button=Search&rec=233

American College of Obstetricians and Gynecologists. (1998). Premature rupture of membranes. Clinical management guidelines for obstetrician-gynecologists (ACOG Practice Bulletin No. 1). *International Journal of Gynaecology and Obstetrics*, *63*(1), 75–84.

American College of Obstetricians and Gynecologists. (2007). Premature rupture of membranes. Clinical management guidelines for obstetrician-gynecologists (ACOG Practice Bulletin No. 80). *Obstetrics and Gynecology*, *109*(4), 1007–1019.

Association of Ontario Midwives. (2010). *Management of prelabour rupture of membranes at term* (AOM Clinical Practice Guideline No. 13). Retrieved from http://www.aom.on.ca/files/Health_Care_Professionals/Clinical_Practice_Guidelines/CPG_PROM_MAR_2011_final.pdf

Benitz, W. E., Gould, J. B., & Druzin, M. L. (1999). Risk factors for early-onset group B streptococcal sepsis: Estimation of odds ratios by critical literature review. *Pediatrics*, *103*(6), e77.

Burchell, R. C. (1964). Premature spontaneous rupture of the membranes. *American Journal of Obstetrics and Gynecology*, *15*(88), 251–255.

Calkins, L. A. (1952). Premature spontaneous rupture of the membranes. *American Journal of Obstetrics and Gynecology*, *64*(4), 871–877.

Centers for Disease Control and Prevention. (2002). Prevention of perinatal group B streptococcal disease: A public health perspective. *Morbidity & Mortality Weekly Report*, *51*, RR-11.

Conway, D. I., Prendiville, W. J., Morris, A., Speller, D. C., & Stirrat, G. M. (1984). Management of spontaneous rupture of the membranes in the absence of labor in primigravida women at term. *American Journal of Obstetrics and Gynecology*, *150*(8), 947–951.

Curtis, P., Resnick, J. C., Evens, S., & Thompson, C. J. (1999). A comparison of breast stimulation and intravenous oxytocin for the augmentation of labor. *Birth*, *26*(2), 115–122.

Dare, M. R., Middleton, P., Crowther, C. A., Flenady, V. J., & Varatharaju, B. (2006). Planned early birth versus expectant management (waiting) for prelabour rupture of membranes at term (37 weeks or more). *Cochrane Database of Systematic Reviews*, (1), CD005302. doi:10.1002/14651858.CD005302.pub2

Davis, L. (1984). The use of castor oil to stimulate labor in patients with premature rupture of membranes. *Journal of Nurse-Midwifery*, *29*(6), 366–370.

Duff, P., Huff, R. W., & Gibbs, R. S. (1984). Management of premature rupture of membranes and unfavorable cervix in term pregnancy. *Obstetrics and Gynecology*, *63*(5), 697–702.

Fahey, J. O. (2008). Clinical management of intra-amniotic infection and chorioamnionitis: A review of the literature. *Journal of Midwifery and Women's Health*, *53*(3), 227–235.

Gunn, G. C., Mishell, D. R., Jr., & Morton, D. G. (1970). Premature rupture of the fetal membranes: A review. *American Journal of Obstetrics and Gynecology*, *106*(3), 469–483.

Hannah, M. E. (1996). Prelabor rupture of the membranes at term. *New England Journal of Medicine*, *335*(15), 1156–1159.

Hannah, M. E., Ohlsson, A., Farine, D., Hewson, S. A., Hodnett, E. D., Myhr, T. L., . . . Willan, A. R. (1996). Induction of labor compared with expectant management for prelabor rupture of the membranes at term. TERMPROM study group. *The New England Journal of Medicine*, *334*(16), 1005–1010.

Hannah, M. E., Ohlsson, A., Wang, E. E., Matlow, A., Foster, G. A., Willan, A. R., . . . Seaward, P. G. (1997). Maternal colonization with group B streptococcus and prelabor rupture of membranes at term: The role of induction of labor. TermPROM study group. *American Journal of Obstetrics and Gynecology*, *177*(4), 780–785.

Kappy, K. A., Cetrulo, C. L., Knuppel, R. A., Ingardia, C. J., Sbarra, A. J., Scerbo, J. C., & Mitchell, G. W. (1982). Premature rupture of the membranes at term. A comparison of induced and spontaneous labors. *The Journal of Reproductive Medicine*, *27*(1), 29–33.

Lanier, L. R., Jr., Scarbrough, R. W., Jr., Fillingim, D. W., & Baker, R. E., Jr. (1965). Incidence of maternal and fetal complications associated with rupture of the membranes before onset of labor. *American Journal of Obstetrics and Gynecology*, *93*, 398–404.

Lin, M. G., Nuthalapaty, F. S., Carver, A. R., Case, A. S., & Ramsey, P. S. (2005). Misoprostol for labor induction in women with term premature rupture of membranes: A meta-analysis. *Obstetrics and Gynecology*, *160*(3), 593–601.

Newton, E. R., Prihoda, T. J., & Gibbs, R. S. (1989). Logistic regression analysis of risk factors for intra-amniotic infection. *Obstetrics and Gynecology*, *73*(4), 571–575.

Schutte, M. F., Treffers, P. E., Kloosterman, G. J., & Soepatmi, S. (1983). Management of premature rupture of membranes: The risk of vaginal examination to the infant. *American Journal of Obstetrics and Gynecology*, *146*(4), 395–400.

Seaward, P. G., Hannah, M. E., Myhr, T. L., Farine, D., Ohlsson, A., Wang, E. E., . . . Hodnett, E. D. (1997). International Multicentre Term Prelabor Rupture of Membranes Study: Evaluation of predictors of chorioamnionitis and postpartum fever in patients with prelabor rupture of membranes at term. *American Journal of Obstetrics and Gynecology*, *177*(5), 1024–1029.

Seaward, P. G., Hannah, M. E., Myhr, T. L., Farine, D., Ohlsson, A., Wang, E. E., . . . Ohel, G. (1998). International multicentre term PROM study: Evaluation of predictors of neonatal infection in infants born to patients with premature rupture of membranes at term. Premature rupture of the membranes. *American Journal of Obstetrics and Gynecology*, *179*(3 Pt. 1), 635–639.

Shubeck, F., Benson, R. C., Clark, W. W., Jr., Berendes, H., Weiss, W., & Deutschberger, J. (1966). Fetal hazard after rupture of the membranes. A report from the collaborative project. *Obstetrics and Gynecology*, *28*(1), 22–31.

Soper, D. E., Mayhall, C. G., & Dalton, H. P. (1989). Risk factors for intraamniotic infection: A prospective epidemiologic study. *American Journal of Obstetrics and Gynecology*, *161*(3), 562–568.

Soper, D. E., Mayhall, C. G., & Froggatt, J. W. (1996). Characterization and control of intraamniotic infection in an urban teaching hospital. *American Journal of Obstetrics and Gynecology*, *175*(2), 304–310.

Taylor, E. S., Morgan, R. L., Bruns, P. D., & Drose, V. E. (1961). Spontaneous premature rupture of the membranes. *American Journal of Obstetrics and Gynecology*, *82*, 1341–1348.

Tita, A. T., & Andrews, W. W. (2010). Diagnosis and management of clinical chorioamnionitis. *Clinics in Perinatology*, *37*(2), 339–354.

Webster, A. (1969). Management of premature rupture of the fetal membranes. *Obstetrical & Gynecological Survey*, *24*(6), 485–496.

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Tethering in Labor: The Effect of Current Practices on the Normalcy of Labor

10

Susan Yount and Meghan Garland

FREEDOM AND CONTROL DURING LABOR

Monitoring the normalcy of the birth process and providing labor support are best practices of nurse-midwifery care. Yet, the normal birth is often not allowed to unfold. During the last century, birth has moved from a home-based, woman-centered experience to a highly medicalized event in the hospital (Scott, Klaus, & Klaus, 1999). Childbearing is the number one reason for hospitalization in the United States, a rite of passage and a life-changing event for more than 4.3 million mothers annually (Sakala & Corry, 2008). Nearly two thirds of these births are vaginal (Martin et al., 2010).

Perceived control of the birth experience is important to women, and controversy exists whether women feel involved with their births and in control when they enter the hospital environment, with the attendant potential for high levels of technological intervention. Do women surrender control and assume the sick role when they enter the hospital environment? During the birth process, women say they do not want to feel like an object in the event. Rather, they want to be the subject, with control and participation in decision making (Waldenström, 1999).

A correlation exists between perceived control and childbirth satisfaction (Knapp, 1996), and a satisfying birth will be influenced by what a woman defines as control, including perceptions about freedom. Waldenström (1999) found in her study that "perceptions during labor as well as medical interventions had an impact on women's overall experience of labor and birth" (p. 480) and that medical interventions were not accepted by the women even though they may have been necessary. *Tethering in labor*, as defined by the authors of this chapter, encompasses devices or routines that restrict normal movement or nourishment of the laboring woman. Numerous factors influence the amount of freedom allowed laboring women, which in turn potentially affect the normalcy of labor. Examples include frequent measurements of maternal vital signs, continuous fetal monitoring,

technologically driven nursing care, restriction of food and fluid, and routine pain management strategies. These are the issues that are addressed in this chapter.

Key questions for best practices for midwifery care centered on control and freedom in labor are the following:

- Do women who are tethered during labor and birth consider that they are in control of their labors and their bodies?
- Are women who experience high levels of tethering satisfied with their birth experiences?

These are not new questions. In 1986, Scupholme, McLeod, and Robertson asked if there is a "need for application of all this technology to the low-risk obstetric patient" (p. 601).

Few women who experience birth attended in a U.S. hospital have a noninterventive or minimally interventive childbirth. An intervention can be as simple as taking vital signs, and even this minimum intervention may disrupt the natural process, as it requires the woman to move outside of her moment, interrupting the dance of labor. Although some monitoring of vital signs is necessary, how do multiple restrictive interventions tether the woman and affect the labor process?

Depending on the birth setting, the type and number of interventions varies. In a birth center or home birth setting, interventions may be limited to intermittent maternal and fetal vital signs per protocol and possibly an intravenous (IV) line for hydration or antibiotic administration. Under these circumstances, the woman has more freedom of movement. In many hospital settings, when a woman is admitted in labor, she will immediately receive an IV, be robed in hospital clothes, put to bed, and have maternal and fetal vital sign monitors attached to her body (blood pressure cuff and electronic fetal monitor [EFM]). She may be advised not to eat or drink or to drink clear liquids sparingly.

Per the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN, 2010), at minimum, the following should be assessed upon presentation of a woman in labor:

- Frequency and duration of contractions;
- Fetal well-being, presentation, and station;
- Maternal vital signs;
- Cervical dilation and effacement;
- Status of the membranes, intact or ruptured; and
- Urinary protein.

These interventions, although essential to monitoring well-being, influence the woman or couple's sense of choice, involvement, and freedom and could affect satisfaction with the birth experience. More invasive interventions such as induction or augmentation of labor, operative delivery, and obstetric analgesia are associated with a negative birth experience (Waldenström, 1999). Other negative influences on birth satisfaction are unattended pain, long labor, and anxiety with the initiation of medical interventions (Waldenström, 1999). Unfortunately, one medical intervention often starts a cascade of events leading to further interventions, each having its

effect on the woman's body and level of confidence in her ability to birth. Women describe the birth experience as positive when they are allowed to be involved in the birth process, feel free to express themselves during labor, and feel supported by their partner or midwife (Waldenström, 1999). Midwife (with woman) implies presence, not control. "Evidence-based maternity care gives priority to effective care with least harm" (Sakala & Corry, 2008, p. 4). The following discussion looks at the evidence on tethering: the restriction of activity and intake during labor.

HYDRATION AND NUTRITION IN LABOR

Restriction of Oral Fluids and Food in Labor

Optimal hydration for laboring women has never been defined in the literature. However, researchers in sports medicine compare a laboring woman to the athlete in a distance run (Coco et al., 2010) or a person engaged in continuous moderate aerobic exercise (Eliasson, Phillips, Stajduhar, Carome, & Cowsar, 1992). The American College of Nurse-Midwives (ACNM, 2008) states, "Parturition is an energy-consuming process regulated by a complex system of neural and hormonal responses" (p. 277). Due to the physiological effects of dehydration, labor can be prolonged if uterine tissues are exhausted and dehydrated. Prevention of thirst and providing hydration supports uterine physiological functioning (Dawood & Quenby, 2009).

DeLee, the noted historical obstetrician, advised women to eat and drink during labor to avoid weakness, delayed labor, and serious postpartum hemorrhage. DeLee's recommendation was the standard of practice for this era of obstetrics (as cited in Broach & Newton, 1988). In the 1940s, when general anesthesia became a common intervention during labor and birth, a study by Mendelson in 1946 challenged this recommendation and advised that all laboring women be prohibited from consuming food or liquids during labor to avoid pulmonary aspiration and obstruction from vomited stomach contents if, by chance, they needed general anesthesia (Coco et al., 2010; Mendelson, 1946). With the restriction of oral fluids and nutrition, the aggressive use of IV fluids became common in the 1960s and 1970s (ACNM, 2008).

Currently, antacids and epidural anesthesia have greatly reduced the risk of pulmonary complications in delivery (Coco et al., 2010). Regional anesthesia is common practice in both labor and birth, replacing general anesthesia use. Still, IV fluids have largely replaced oral intake in labor, and the medical order for nothing by mouth (NPO) is common (Sommer, Norr, & Roberts, 2000). Most women are allowed only sips of fluids or ice chips in labor (ACNM, 2008). The American Society of Anesthesiologists continues to recommend that all low-risk laboring women avoid solid foods and drink only small amounts of clear fluids and that women with additional risk factors be evaluated individually regarding oral fluid intake (ACNM, 2008). This practice has persisted for the past 50 years, although there have been no cases of maternal mortality that cite oral intake as a cause or factor in aspiration under general anesthesia during birth in the United States, Australia, or the United Kingdom (Parsons, Bidewell, & Nagy, 2006).

O'Sullivan, Liu, Hart, Seed, and Shennan (2009) challenged the American Society of Anesthesiologists 2007 practice guidelines (still based on 65-year-old research), which recommend against solid food consumption during labor. These authors conducted a randomized study ($n = 2426$) examining outcomes among women who consumed water only during labor and women who ate during labor. The authors noted that 6% of the women preferred nothing to eat or drink during labor. There was no difference between the two groups in epidural analgesia, oxytocin induction or augmentation, duration of labor, rates of vaginal birth, rates of cesarean, or rates of instrument-assisted birth. Apgar scores and neonatal admissions were similar. The study showed lack of evidence of maternal or fetal harm or rationale to withhold food. The authors recommended that women be allowed to consume food at will in labor (O'Sullivan et al., 2009).

A prospective, comparative study with concurrent controls examined the effect of natural eating behaviors on labor and birth outcomes in four hospitals in Sydney, Australia. Because few women actually ate during the active phase of labor, findings were confined to the latent phase of labor. Eighty-two women consumed food at will, with almost one third of these women eating full meals during the latent phase and the remaining women eating light meals. Ninety-four of these 176 low-risk, nulliparous women consumed only clear fluids. Similar rates of women across both groups vomited during latent or active labor. The authors noted that the rate of vomiting in labor was unrelated to whether women consumed food during the latent phase ($p = .80$; Parsons et al., 2006).

Women in the noneating, clear fluids-only group had shorter latent phases (6.79 hours) compared to women who ate (8.31 hours; Parsons et al., 2006). The time for active labor and second stage were longer in women who ate (4.40 hours) compared to women in the clear fluids group (2.97 hours). When controlled for all variables, there were no significant relationships between consumption of food, any medical interventions, fetal position, or adverse fetal or maternal outcomes. A limitation of the study was maternal retrospective recall on timing of onset of latent and active phases of labor (Parsons et al., 2006). Although the study question remains unanswered, the authors recommended that "women eat in limited quantities until it is demonstrated that larger amounts are safe" (Parsons et al., 2006, p. e5). The authors also recommended that if surgical intervention was anticipated, a woman should not eat in labor (Parsons et al., 2006).

As labor progresses, it is natural for women to eat and drink less (Kubli, Scrutton, Seed, & O'Sullivan, 2002; Ludka & Roberts, 1993; O'Reilly, Perrone-Hoyer, & Walsh, 1993; Parsons et al., 2006). The evidence shows that low-risk women should be able to decide if they need to eat and drink fluids as long as there are no indications that surgical intervention may occur.

Placement of Intravenous Lines

There are no published studies defining the amount of fluid needed to avoid dehydration in labor. However, a study by Noakes (1993) reported that more than 500 ml/hr are required in prolonged exertion to replenish lost fluids. Whether this can be accomplished orally is in question. In 2009, a Cochrane review protocol was

proposed to study the role of IV fluids in the prevention of dehydration and prolonged labor in nulliparous women. To date, the results are not posted (Dawood & Quenby, 2009). Dawood and Quenby raise the question that IV placement could negatively impact the woman's perception of the normalcy of her labor experience, inhibit her mobility, and cause discomfort at the IV site. In a study in the late 1970s, approximately 50% of laboring women reported that an IV restricted their movements and disturbed them (Kirke, 1980).

Using the framework from exercise physiology, in which hydration enhances muscle performance, Garite, Weeks, Peters-Phair, Pattillo, and Brewster (2000) applied this analogy to the contracting uterus. A randomized controlled trial (RCT) on the effect of increased IV hydration on the course of labor examined nulliparous women at term with uncomplicated pregnancies. These women ($n = 195$) were randomized to either the 125-ml/hr group or the 250-ml/hr group. The mean duration of the first stage of labor among the more hydrated group was statistically significant ($p = .060$), but there was no difference in the mean duration of the second stage. Overall labors were shortened by 71 minutes in the first stage in the more hydrated group (Garite et al., 2000).

Women in the less hydrated group were more likely to have prolonged labor ($p = .047$) using the definition of prolonged labor as more than 12 hours. Oxytocin augmentation was significantly more common in the less hydrated group ($p = .062$), but rates of maternal and neonatal complications including cesarean birth rates were similar between the two groups (Garite et al., 2000). The study suggested that nulliparous women would experience lower rates of prolonged labor and less need for oxytocin with increased hydration during labor (Garite et al., 2000).

A concern about this study is the definition of prolonged labor as more than 12 hours for nulliparous women. The women in this study were admitted in active labor at 2- to 5-cm dilation, a considerable variance, and not necessarily the standard parameter for active labor. Depending on the recorded onset of labor (subjective) and actual dilation (2–5 cm in latent and/or active phases), the definition of 12 hours as prolonged labor may not have been enough for women to progress naturally. In addition, the attending physicians were allowed to start other interventions at their discretion, variables that were not addressed in the results (Garite et al., 2000). In spite of these flaws, the strength of this study is the hypothesis that hydration affects labor progression.

Coco et al. (2010) conducted a prospective RCT ($n = 80$) examining length of labor and rate of oxytocin use among nulliparous women in labor who were allowed unrestricted oral fluids as compared to those with IV hydration at 500 ml/hour. The increased rate of IV fluids showed no benefit on labor progression among women who drank oral fluids freely (Coco et al., 2010). The researchers discovered that if women in labor drank to thirst, they generally consumed more than 500 ml/hr. The authors emphasized that the 125 ml/hr standard was originally calculated for women at rest, not for women in labor with freedom of movement (Coco et al., 2010). The authors also noted that there is an extremely low risk of pulmonary aspiration with the consumption of oral fluids in labor and that supplementary IV fluids could place women at risk for pulmonary edema and hyponatremia. Coco et al. stated that current evidence "suggests that there is no risk in allowing oral intake of clear fluids

during labor" (p. 55) and advised against additional IV fluids if women are consuming oral fluids freely during labor. Coco et al. propose that oral fluids are sufficient to support the physiological needs of the laboring woman but acknowledge that a limitation of this study was the small number of subjects (Coco et al., 2010).

In a Cochrane review of five studies and 3130 women, Singata, Tranmer, and Gyte (2010) compared outcomes among women who had restricted food and fluids in labor to women who ate and drank at will. These authors found no benefit or harm in restricting food or fluid for women in labor if they were at low risk for general anesthesia and recommended that women should determine their fluid and food needs (Singata et al., 2010).

VITAL SIGNS IN LABOR

Monitoring Maternal Vital Signs

Measurement of maternal vital signs during labor has historically been used as an indicator of maternal well-being and a proxy measure of fetal well-being. Preeclampsia and eclampsia are factors that increase blood pressure during the labor process. However, systolic and diastolic blood pressure also rise during labor among women who do not have gestational hypertension or preeclampsia (Edwards, 1958).

Blood pressure increases from 15 to 50 mmHg over baseline during contractions. In a study of 52 normal laboring primigravidas under sedation, Edwards (1958) noted blood pressure elevations between 10 and 20 mmHg over their hospital admission blood pressures. These elevations peaked during late first stage and again during maternal expulsive efforts. Sedation, in this study, included the use of chloral hydrate, pethidine, nitrous oxide, or trilene, depending on the stage of labor (Edwards, 1958).

Several professional organizations, including the American College of Obstetricians and Gynecologists (ACOG), the AWHONN, and the World Health Organization (WHO), have made recommendations on protocol for frequency of maternal vital signs in labor. All recommend that maternal blood pressure should be taken at least every 4 hours and at increased frequency if clinically indicated (ACOG, 2009; WHO, 1999). Temperature and pulse should also be taken at regular intervals, recommendations varying. Many labor settings including hospitals and birth centers take blood pressures more often than recommended, as frequently as hourly in first stage of labor and every 15 to 30 minutes in second stage. Women who have epidural anesthesia generally have more frequent blood pressure readings during labor. The only professional body recommending such frequent blood pressure monitoring is the U.S. Army Medical Department Center and School at Fort Sam Houston. However, this formula for hourly blood pressure monitoring is used in nursing and midwifery textbooks (as cited in Littleton & Engebretson, 2002; Pilliteri, 2010; Varney, Kriebs, & Gregor, 2004).

In American hospitals, blood pressures are usually monitored by automated blood pressure cuffs. Many maternity units use automated cuffs that are built into other monitoring equipment such as external fetal monitors. The blood pressure cuff may be programmed to inflate at pre-set intervals and is kept on the woman

throughout her labor. Typically, the cable connects the blood pressure cuff to the external fetal monitor or a portable blood pressure machine, barely reaching across the hospital bed. While creating significant hindrance to maternal freedom of movement during labor, the accuracy of this automated equipment, especially among laboring women with preeclampsia, hypertension, or hypotension, is questionable (Marx, Schwalbe, Cho, & Whitty, 1993; Skirton, Chamberlain, Lawson, Ryan, & Young, 2011). Among women with epidural anesthesia, Marx et al. noted labor-related rises in blood pressure unrelated to hypertensive disorders. This observation reinforces the observation of Edwards (1958) and others that elevation in systolic and diastolic blood pressure is a physiological component of the labor process. Marx et al. were not examining maternal blood pressure as the primary outcome, but rather comparing the accuracy of the automated Dynamap blood pressure machine to manual auscultation.

Monitoring Fetal Well-Being During Labor

Fetal monitoring became a practice in the 1960s after the Friedman curve was introduced in the 1950s (Bailey, 2009; Neilson, 2006). The introduction of the partogram raised the question of the acceptable length of labor (Farine, Shenhav, Barnea, Jaffa, & Fox, 2006). Researchers from the United States, Germany, and Uruguay developed continuous EFM in the 1960s as a screening test for fetal asphyxia (Albers, 2001). By the mid to late 1970s, continuous electronic fetal monitoring (CTG/EFM), whether internal or external, became a routine practice (Albers, 2001; Martin et al., 2003; Neilson, 2006). In the 1980s, the rise in use of EFM was greatest among low-risk women (Albers, 2001). Today, EFM is used with 84% of laboring women in the United States (Kozak, Hall, & Owings, 2002), replacing intermittent auscultation (IA) for fetal surveillance (Albers, 2001; ACNM, 2010; Conason & Pegalis, 2010), despite lack of evidence on the benefit of EFM over IA (Albers, 2001; Bailey, 2009).

EFM records the changes in fetal heart rate in relation to uterine activity. Upon admission to labor in a hospital setting, EFM is performed for a specified amount of time and to meet a specified criterion, even though this action has not been shown to improve fetal outcomes and may lead to increased interventions (Albers, 2001; ACNM 2010). Conason and Pegalis (2010) describe a "culture of safety" that begins with antepartum testing identifying the fetus at risk prior to labor, and then continues into the labor environment. The question has been posed whether IA should be used if EFM is available, but the public has come to believe that EFM will alert the health care provider to warning signs from which management decisions can be made (Conason & Pegalis, 2010).

In a classic study, Leveno et al. (1986) examined how labor room staff prioritized the use of EFM in a large study in Texas. The number of available monitors (19 versus 7) was alternated on 20-bed unit. Over 3 years, women monitored when monitors were readily available (n = 17,759) were compared to women monitored when monitors were scarce (n = 17,571; Leveno et al., 1986). The researchers alternated months with 19 versus 7 monitors available. In the months with limited monitor availability, 37% of women had continuous EFM compared

to 79% during the months of increased availability (Leveno et al., 1986). When the monitors were scarce, women were selected for EFM use when they had fetal heart rate abnormalities, meconium fluid, preterm labor, post dates pregnancy, twin gestation, breech presentation, dysfunctional labor, or oxytocin administration. IA was performed every 30 minutes with a nurse-to-woman ratio of 1:2 (Leveno et al., 1986). The study showed a significant difference in cesarean births: 19% in the universal EFM monitored group compared to 17.2% in the selective EFM group (Leveno et al., 1986). There were no differences between groups in perinatal outcomes (Leveno et al., 1986). Although this study is now a classic, it exemplifies two points:

- Ready availability of EFM increases staff reliance on monitoring.
- When necessary to prioritize, staff used EFM with higher-risk women.

The question has been raised whether EFM saves or protects the lives of babies. Alfirevic, Devane, and Gyte (2006) undertook a Cochrane review examining identification of hypoxic fetuses via EFM, IA, or no fetal monitoring. Of the 12 studies ($n \geq$37,000 women), two studies were of high quality. There was no significant difference in perinatal death rate (RR, 0.85; 95% CI, 0.59–1.23) or cerebral palsy (RR, 1.74; 95% CI, 0.31–0.80) comparing IA and EFM (Alfirevic et al., 2006). EFM was associated with a 50% reduction in neonatal seizures compared to IA (RR, 0.50; 95% CI, 0.97–3.11) and was associated with both a significant increase in cesarean birth (RR, 1.66; 95% CI, 1.30–2.13) and instrumental vaginal birth (RR, 1.16; 95% CI, 1.01–1.32). EFM increased the rate of cesarean birth by 66% and the rate of operative delivery by 16% (Alfirevic et al., 2006).

A Cochrane review (n = 10,628 women and five trials) on EFM and fetal electrocardiography (ECG), the fetal scalp electrode, was published in 2006 (Neilson, 2006). Using ECG plus cardiotocography (CTG) resulted in increased oxygen administration, less surgical intervention, and fewer fetal blood samples than EFM alone. The author stated these results should be interpreted with caution and that ECG should only be used if the EFM was non-reassuring (Neilson, 2006).

The use of CTG/EFM does not support a reduction in perinatal mortality when compared with IA (Devane, Smith, & Healy, 2010). Whereas EFM is the norm in the United States, IA is practiced widely in other countries (Sholapurkar, 2010). In a meta-analysis of RCTs, the ACOG (2009) showed no benefit of EFM over IA in laboring low-risk women nor good evidence regarding recommended frequency and duration of IA. The present guidelines are based on expert opinion (ACOG, 2009). The ACNM (2010) recommended, "IA is the preferred method for monitoring the FHR during labor for women at term who at the onset of labor are low risk for developing fetal ischemia" (p. 401).

Bakker et al. (2010) performed an RCT in the Netherlands comparing internal tocodynamometry with external monitoring for women whose labor was induced or augmented (n = 1456 women in six hospitals). There was no significant reduction in the rate of operative births (RR, 1.1; 95% CI, 0.91–1.2), neonatal outcomes (RR, 0.95; 95% CI, 0.74–1.2), length of labor, or use of antibiotics or analgesia.

The authors concluded that the results did not support the routine use of internal tocodynamometry with induced or augmented labor (Bakker et al., 2010).

Maternal overweight or obesity may alter the results of EFM. An alternative with less mobility restriction for obese women is the Doppler cardiogram (Reinhard, Hayes-Gill, Yi, Hatzmann, & Schiermeier, 2010). A total of 27 women with a median body mass index (BMI) of 28.4 were monitored for fetal response to labor with both CTG/EFM and a noninvasive ECG to test the accuracy and reliability of the abdominal ECG in labor. These women preferred the abdominal ECG over the EFM for reasons of comfort (no abdominal straps, just five abdominal electrodes with a small mobile recorder). The results of fetal recordings between ECG and CTG/EFM during the first stage of labor were compared with similar readings between the two methods, independent of the BMI (Reinhard et al., 2010). No significant differences were found. This method may offer noninvasive means that promotes increased mobility during labor while maintaining monitoring accuracy among overweight or obese women (Reinhard et al., 2010).

Many factors besides overweight or obesity can alter EFM tracing, including maternal medication, fetal sleep–wake cycle, thumb sucking, and fetal anemia or hydrops (Bailey, 2009). There have been concerns for years about the reliability of the tracings. Recommendations for evaluation and management issued in 1997 by the National Institute of Child Health and Human Development (NICHD) were adopted by ACOG in 2002 (Bailey, 2009). In 2008, these recommendations have been revised by NICHD, ACOG, and the Society for Maternal-Fetal Medicine (Bailey, 2009; Salim, Garmi, Nachum, & Shalev, 2010).

In 2010, ACOG published a three-tiered categorization for evaluation and management of EFM patterns. Category I allows for routine management of labor with either IA or EFM. Category II generally requires some manner of intervention, for example, maternal lateral positioning, oxygen administration, IV fluid bolus, discontinuing oxytocin, administering tocolytic, amnioinfusion, or elevating the fetal parts for a prolapsed cord. Category III tracings have a poor predictive value but are associated with fetal risk for cerebral palsy, neonatal acidosis, and encephalopathy, which often requiring prompt parturition (ACOG, 2010). According to the ACOG, EFM is a tool with extremely high false-positive results (ACOG, 2005).

In spite of evidence to the contrary, EFM has created an image of safety in childbirth among the public. Yet, women complain that this tethering in labor is uncomfortable, restricts movement, and focuses the experience on the machine rather than the mother (Kirke, 1980). The evidence supports IA to be safe or possibly safer for monitoring fetal well-being in a laboring woman at low risk for birth-related complications.

PAIN MANAGEMENT IN LABOR

According to the Listening to Mothers Survey (Declercq, Sakala, Corry, & Applebaum, 2007), about 86% of women in the United States choose to give birth with pharmacologic pain relief, a factor that significantly contributes to

immobility during labor. At the turn of the 20th century, political advocates argued that repetitive pregnancies and painful, poorly managed births were impediments to achieving political and economic goals (Leavitt, 1991; Rooks, 1997). Offering spinal anesthesia and twilight sleep (a combination of scopolamine and morphine) during hospital birth was a response to the issue of pain and effectively ended the tradition of home birth attended by midwives in the United States (Caton, Frölich, & Euliano, 2002).

The preceding century had brought about a shift in the general public's perception of the nature of pain. During the 19th century, pain in all forms was thought to be pathologic and psychologically damaging. The alleviation of pain and suffering in every form was thought to be the solution for social ills. Faith that science and technology could overcome all causes of suffering, combined with the American spirit of free enterprise, gave rise to the modern maternity hospital (Caton et al., 2002).

Spinal anesthesia was quickly abandoned due to undesirable side effects, including headaches and blood pressure fluctuations. However, the increasing use of forceps during the first half of the 20th century necessitated effective anesthesia for birth. The rising rate of cesarean birth also influenced the development of improved labor anesthesia. Women in the first half of the 20th century had a 15-fold increase in maternal mortality if general anesthesia was used for emergent cesarean birth. Over the next decades, advances including new forms of opioids and a variety of new spinal blocks were invented (Caton et al., 2002).

The 1950s witnessed the public rejection of heavily medicated labors and the embrace of natural childbirth due in part to increasing awareness of the effects of drugs on the newborn. In 1950, Virginia Apgar proposed her scoring system that used the condition of the newborn at birth to evaluate the impact of previous anesthetic treatments on the mother (Caton et al., 2002). The demand for changes in the way birth was managed coincided with changes in popular perception that pain may have physiologic, psychological, and social value, ideas promoted by anthropologists and other social scientists. Today, there are complex and contradictory views in society reflecting both the right to natural, unmedicated birth and freedom from pain in childbirth, interpreted by some as the right for epidural anesthesia (Caton et al., 2002).

Opioid Analgesia

The rate of opioid administration during labor in the United States ranges from 39% to 56%. The rate of use is inverse to the proportion of epidural anesthesia (Bricker & Lavender, 2002). Initial introduction of parenteral opioids began with the invention of the hypodermic needle in the mid-1800s. However, the practice of using morphine to manage labor pain was quickly abandoned due to concerns about effects on the neonate. The introduction of twilight sleep in the early 1900s (a combination of scopolamine and morphine) was initially thought to be an improvement but neonatal problems persisted. Despite the neonatal respiratory depression, the practice remained popular for years. Pethidine (otherwise known

as meperidine or Demerol) is the most widely studied opioid for management of labor pain. Concerns about neonatal complications and questionable efficacy of meperidine led to investigations of other opioids and adjunctive medications, including benzodiazepines and phenothiazines (Bricker & Lavender, 2002).

In an effort to achieve adequate pain relief while reducing fetal effects, partial agonists, weak opioids, and, more recently, potent fast-acting opioids have all been investigated along with dosage, dosing intervals, and route of administration. A review of 48 trials published between 1961 and 1999 compared parenteral opioids to other opioids, placebo, epidural analgesia, and paracervical block. The investigators concluded that there is no convincing evidence that other opioids provide improved pain relief or reduce neonatal complications compared to meperidine. Route of administration (IM, IV, or patient-controlled anesthesia [PCA]) does not change maternal perception of pain relief and neonatal outcome data is lacking (Bricker & Lavendar, 2002).

More recent studies of maternal pain relief and neonatal outcomes using PCA administration of Remifentanil (a faster acting more rapidly metabolized opioid than meperidine) have also been inconclusive (Wong, 2009). One trial in the review by Bricker and Lavender (2002) found that paracervical block provided superior analgesia for the first 60 minutes after opioid administration compared to IM meperidine. However, the difference was no longer statistically significant 80 minutes after administration. There were no meaningful differences between the groups for reported outcomes, including epidural analgesia, cesarean birth, instrumental birth, or fetal distress. The coadministration of benzodiazepines improved maternal pain relief scores but had significantly higher rates of sedation. Neonatal outcomes were not different between meperidine alone and meperidine plus benzodiazepine. Studies comparing promethazine as the co-drug compared to IM meperidine demonstrated worse pain relief and higher rates of sedation in the promethazine arm and no difference in other outcomes measured, including nausea, vomiting, and duration of labor. Neonatal outcomes were not assessed (Bricker & Lavender, 2002).

Bricker and Lavender (2002) compared meperidine with metoclopramide as the co-drug compared to coadministration of promethazine or placebo co-drug with meperidine. They noted less analgesia use (including epidural) in the metoclopramide arm but other differences were either not significant or not reported. The authors were not able to identify any studies comparing opioids to nonpharmacological methods of pain relief. The authors noted that effects of these drugs on breastfeeding and maternal–infant bonding were not measured as outcomes in any of the 48 reviewed studies (Bricker & Lavender, 2002). The impact of opioids on decreasing mobility during labor has been ignored in the literature.

Epidural Analgesia

A 2001 survey of a large maternity hospital in the United States showed that more than 60% of laboring women received epidural or combined spinal-epidural anesthesia, and rates as high as 90% have been reported (Wong, 2009).

The higher the volume of births in a setting, the higher the number of epidurals used (Marmore & Krol, 2002). The popularity of epidural anesthesia is a relatively recent phenomenon.

Epidural analgesia (all methods and medications) provides improved pain relief compared to parenteral opioids (Bricker & Lavender, 2002). However, parenteral opioids are associated with shorter first- and second-stage labor, less oxytocin augmentation, fewer fetal malpositions, and fewer instrumental deliveries. Cesarean birth rates were not significantly different between the two groups. Neonatal outcomes including Apgar scores of <7 at 5 minutes and naloxone administration were comparable between the two groups. The authors noted that there is significant heterogeneity between trials due to epidural rescue (women opting for epidural analgesia after entry into the opioid arm of the trial; Bricker & Lavender, 2002).

Epidural anesthesia is unique among pain relief options for labor in that it has the ability to ameliorate a wide variety of pain sensations. It effectively blocks the diffuse abdominal cramping pain commonly experienced in the first stage of labor. It also mediates sensation from the distention of the vagina and perineum by the fetal presenting part during the second stage of labor. This sensation originates in the larger somatic fibers that innervate the sacral area. Because epidural anesthesia has been refined, new medication (substituting ropivacaine or bupivacaine for lidocaine) and lower doses and concentrations have been introduced. Combined with improvements in methods of administration (plastic catheters and infusion pumps), epidurals are now more consistent and predictable. Over the past decade, combined spinal-epidural (CSE) anesthesia has become more common. CSE involves an intrathecal dose of lipid-soluble opioid (often fentanyl or sufentanil) and simultaneous placement of an epidural catheter, which delivers a continuous infusion of anesthetics or a combination of anesthetics and opioids (Polley & Glosten, 2004). The rapid onset of action makes it better suited for women nearing second stage, and the lower doses of anesthetics are attractive because there is less motor blockade, theoretically making it possible to move or ambulate (Wong, 2009).

Like all medical interventions, epidural anesthesia and CSE require the use of specialized equipment, including spinal needles, epidural catheters, and infusion pumps. They also require equipment to monitor maternal and fetal tolerance of the intervention (maternal blood pressures every 5 to 15 minutes and continuous fetal monitoring during and after administration). Emergency equipment, including a pre-placed peripheral IV line, ephedrine, and an oxygen source, must be immediately available (Polley & Glosten, 2004). Skilled nursing care is necessary to manage this equipment and monitor for maternal or fetal complications. Due to the risk of maternal hypotension, women are encouraged to stay in bed and call for assistance to change position. There are also small risks for potentially life-threatening complications, including maternal hypotension and fetal bradycardia independent of maternal hypotension. Although these complications can generally be managed, they do not appear to increase the rate of cesarean birth (Mayberry, Clemmens, & De, 2002).

As a direct effect of the anesthesia on the dorsal horn at the level of T10–T12, which innervates the adrenal medulla, fetal bradycardia may be caused by uterine

hypertonus associated with a fall in catecholamines, particularly epinephrine, possibly due to the cessation of labor pain (Polley & Glosten, 2004). Epinephrine is a tocolytic and there appears to be a balance between oxytocin and epinephrine that regulates uterine contractility in labor (Leighton & Halpern, 2002). There are also risks associated with accidental IV injection of anesthetic, which can cause seizures or possibly cardiac arrest (Polley & Glosten, 2004). Total spinal anesthesia, epidural abscesses, and hematoma can occur although they are rare (Mayberry et al., 2002).

Epidural analgesia appears to have little effect on the rate of cesarean births when compared to opioids. There is limited data comparing the rate of cesarean births among women undergoing epidural analgesia with women who had nonpharmacologic methods of pain relief. A study by Nguyen et al. (2010) found an increased risk for operative vaginal birth in both primigravidas and multigravidas among women who labor with an epidural compared to opioid administration or nonpharmacological methods. The evaluated women were at low risk for labor, and birth-related complications were matched to groups laboring in three hospitals or freestanding birth centers in San Diego County. The same criteria for admission to the birth center were used for the hospital group: study exclusions included women $<$37 weeks' gestation, birth weight $>$4500 g, nonvertex presentation, placenta previa, vaginal bleeding, cord prolapse, preeclampsia/eclampsia, active herpes, nonreassuring fetal heart rate, abruption, clotting abnormality, treatment for preterm labor in the current pregnancy, or previous cesarean birth (Nguyen et al., 2010).

One question about epidural analgesia is the impact on mobility during labor. The discovery of opioid receptors in the dorsal horn of the spinal cord and the subsequent introduction of opioids into epidural analgesia has been proposed as the solution to the "dead leg" motor blockade and hypotension associated with local anesthetic in epidural analgesia (Wong, 2009). However, the degree of impaired mobility is not noted in most studies. The current measures used (standing on one leg and flexing the leg, or the Bromage/modified Bromage test that involves flexing the leg and raising the knee while supine) may not be adequate assessments of the ability to ambulate safely (Mayberry et al., 2002).

Several studies that have assessed motor ability and ambulation after administration of epidural analgesia report rates of ambulation as high as 100%. However, the term ambulation is not defined. Other studies have noted that more than two thirds of women who have been encouraged to ambulate after epidural placement choose not to do so (Mayberry et al., 2002). Several side effects of epidural anesthesia affect ambulation and movement. The need for continuous fetal monitoring and maternal blood pressure assessment are significant impediments to mobility. Hypotension (defined as systolic blood pressure $<$90 mmHg or a 20% to 30% decrease below baseline) has been observed in up to 50% of women with epidurals (Mayberry et al., 2002). It is unlikely that these women, feeling the effects of hypotension, would be allowed out of bed or choose to ambulate even after the hypotension is resolved with either IV fluids or ephedrine.

Current anesthesia guidelines recommend 1 L of IV fluid preload bolus of glucose-free fluids prior to epidural placement in order to prevent maternal hypotension (Polley & Glosten, 2004). This bolus results in a significant reduction in

uterine activity after epidural initiation. The result may be the cascade of augmenting labor with oxytocin (Mayberry et al., 2002).

Immobility related to pharmacological pain management results in a tethering effect on the woman, potentiating the cascade of events that lead to high levels of intervention in childbirth. This chapter has reviewed the evidence for efficacy of these interventions.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 10.1

Tethering in Labor: The Effect on Normalcy

Samantha is a 25-year-old gravida 2 para 1 woman at 39 weeks 3 days gestation. She arrives at the hospital in spontaneous labor. She denies spontaneous rupture of membranes or vaginal bleeding and reports good fetal movement. Her health care provider determines she is 3-cm dilated, 70% effaced, and −2 station. Her contractions are moderate to palpation and Samantha rates her pain as 4 out of 10 on the pain scale. Samantha expresses that she would like to try to have her baby as naturally as possible. Samantha is considered low risk. She is admitted for labor management, and she is assigned a nurse who is currently caring for another woman in active labor.

Samantha is given a thin cotton hospital gown, an IV is placed, laboratory blood tests are drawn, and orders are written for IV fluids, clear liquid diet, continuous EFM, and epidural upon request. About 1 hour after admission, the provider performs a cervical exam and notes that Samantha is now 3 to 4 cm dilated and 80% effaced. An amniotomy is performed and Pitocin augmentation is ordered without informing Samantha this is being done. Samantha reports that she feels relatively comfortable and is hungry. Ignoring Samantha's comments, her nurse informs her that if she wants an epidural, she should get it now because she is going to be busy with her other patient who will begin pushing soon. Two hours later, the nurse performs a vaginal exam and tells Samantha there is no change. Samantha expresses she is in a lot of pain (Pitocin is at 16 mu) and now wants an epidural.

Exemplar of Best Practice

This case exemplifies the cascade of events that occur with tethering during labor. Samantha's labor was not well established at the time of admission. Samantha's wishes were ignored while she was given "routine" care, including placement of intravenous lines, restriction of oral sustenance, and continuous EFM. Additionally, Samantha is offered no alternative between epidural and no pain relief. The cascade continued with an amniotomy, Pitocin augmentation, and the subsequent epidural anesthesia.

(continued)

CASE STUDY *(continued)*

Waiting to admit Samantha until she was clearly past latent labor would have been a best practice. In addition, there was no evidence to suggest that Samantha or her baby were in jeopardy and required IV access or continuous EFM upon admission. Samantha was a candidate for intermittent auscultation of fetal heart tones. Dehydration and hypoglycemia can negatively impact labor progress. Intravenous fluids can decrease uterine contractility. The restriction of movement, amniotomy, and adjunct of Pitocin changed the normalcy of the labor process. Best practice indicates that Samantha should be given the opportunity to eat, drink, and ambulate with her support persons to promote labor progress with intermittent auscultation of fetal heart tones.

REFERENCES

Albers, L. L. (2001). Monitoring the fetus in labor: Evidence to support the methods. *Journal of Midwifery & Women's Health*, *46*(6), 366–373.

Alfirevic, Z., Devane, D., & Gyte, G. M. L. (2006). Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour. *Cochrane Database of Systemic Reviews*, (3), CD006066.

American College of Nurse-Midwives. (2008). Providing oral nutrition to women in labor (Clinical Bulletin No. 10). *Journal of Midwifery & Women's Health*, *53*(3), 276–283. doi:10.1016/jj-jmwh.2008.03.006

American College of Nurse-Midwives. (2010). Intermittent auscultation for intrapartum fetal heart rate surveillance (Clinical Bulletin No. 11). *Journal of Midwifery & Women's Health*, *55*(4), 397–403.

American College of Obstetricians and Gynecologists. (2005). Intrapartum fetal heart rate monitoring (ACOG Practice Bulletin No. 62). *Obstetrics and Gynecology*, *106*(Pt. 1), 1161–1169.

American College of Obstetricians and Gynecologists. (2009). Intrapartum fetal heart rate monitoring: Nomenclature, interpretation, and general management principles (Practice Bulletin No. 106). *Obstetrics and Gynecology*, *114*(1), 192–202.

American College of Obstetricians and Gynecologists. (2010). Management of intrapartum fetal heart rate tracings (Practice Bulletin No. 116). *Obstetrics and Gynecology*, *116*(5), 1232–1240.

Association of Women's Health, Obstetric and Neonatal Nurses. (2010). Guidelines for professional registered nurse staffing for perinatal units executive summary. *Nursing for Women's Health*, *15*(1), 81–84. doi:10.1111/j.1751486X.2011.01603.x

Bailey, R. E. (2009). Intrapartum fetal monitoring. *American Family Physician*, *80*(12), 1388–1396.

Bakker, J. J., Verhoeven, C. J., Janssen, P. F., van Lith, J. M., van Oudgaarden, E. D., Bloemenkamp, K. W., . . . van der Post, J. A. (2010). Outcomes after internal versus external tocodynamometry for monitoring labor. *The New England Journal of Medicine*, *362*(4), 306–313.

Bricker, L., & Lavender, T. (2002). Parenteral opioids for labor pain relief: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S94–S109.

Broach, J., & Newton, J. (1988). Food and beverage in labor. Part 1: Cross-cultural and historical practices. *Birth*, *15*(2), 81–85.

Caton, D., Frölich, M. A., & Euliano, T. Y. (2002). Anesthesia for childbirth: Controversy and change. *American Journal of Obstetrics and Gynecology*. *186*(Suppl. 5), S25–S30.

Coco, A., Derksen-Schrock, A., Coco, K., Raff, T., Horst, M., & Hussar, E. (2010). A randomized trial of increased intravenous hydration in labor when oral fluid is unrestricted. *Family Medicine*, *42*(1), 52–56.

Conason, R. L., & Pegalis, S. E. (2010). Neurologic birth injury: Protecting the legal rights of the child. *The Journal of Legal Medicine*, *31*(3), 249–286.

Dawood, F., & Quenby, S. (2009). Intravenous fluids for preventing dehydration and prolonged labour in nulliparous women [Protocol]. *Cochrane Database of Systemic Reviews*, (2), 1–8. doi.org/10.1002/14651858.CD007715

Declercq, E. R., Sakala, C., Corry, M. P., & Applebaum, S. (2007). Listening to mothers II: Report of the second national U.S. survey of women's childbearing experiences. *Journal of Perinatal Education*, *16*(4), 9–14. doi:10.1624%2F105812407X244769

Devane, D., Smith, V., & Healy, P. (2010). Cardiotocography for assessment of fetal well-being during labour. *The Practising Midwife*, *13*(6), 18–20.

Edwards, E. M. (1958). The blood pressure in normal labour. *The Journal of Obstetrics and Gynaecology of the British Empire*, *65*(3), 367–370.

Eliasson, A. H., Phillips, Y. Y., Stajduhar, K. C., Carome, M. A., & Cowsar, J. D., Jr. (1992). Oxygen consumption and ventilation during normal labor. *Chest*, *102*(2), 467–471.

Farine, D., Shenhav, M., Barnea, O., Jaffa, A., & Fox, H. E. (2006). The need for a new outlook on labor monitoring. *The Journal of Maternal-Fetal and Neonatal Medicine*, *19*(3), 161–164.

Garite, T. J., Weeks, J., Peters-Phair, J., Pattillo, C., & Brewster, W. R. (2000). A randomized controlled trial of the effect of increased intravenous hydration on the course of labor in nulliparous women. *American Journal of Obstetrics and Gynecology*, *183*(6), 1544–1548.

Kirke, P. N. (1980). Mothers' views of care in labour. *British Journal of Obstetrics and Gynaecology*, *87*(11), 1034–1038.

Knapp, L. (1996). Childbirth satisfaction: The effects of internality and perceived control. *The Journal of Perinatal Education*, *5*(4), 7–16.

Kozak, L. J., Hall, M. J., & Owings, M. F. (2002). National hospital discharge survey: 2000 annual summary with detailed diagnosis and procedure data. *Vital Health Statistics*, *13*(153), 1–194.

Kubli, M., Scrutton, M. J., Seed, P. T., & O'Sullivan, G. (2002). An evaluation of isotonic "sport drinks" during labor. *Anesthesia and Analgesia*, *94*(2), 404–408.

Leavitt, J. (1991). Under the shadow of maternity. In L. K. Kerber & J. S. De Hart (Eds.), *Women's America: Refocusing the past* (3rd ed., pp. 197–206). New York, NY: Oxford University Press.

Leveno, K. J., Cunningham, F. G., Nelson, S., Roark, M., Williams, M. L., Guzick, D., . . . Buckley, A. (1986). A prospective comparison of selective and universal electronic fetal monitoring in 34,995 pregnancies. *The New England Journal of Medicine*, *315*(10), 615–619.

Littleton, L. Y., & Engebretson, J. C. (2002). *Maternal, neonatal and women's health nursing* (Vol. 1). Albany, NY: Delmar Thomson Learning.

Ludka, L. M., & Roberts, C. C. (1993). Eating and drinking in labor. A literature review. *Journal of Nurse-Midwifery*, *38*(4), 199–207.

Marmore, T. R., & Krol, D. M. (2002). Labor pain management in the United States: Understanding patterns and issues of choice. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S173–S180.

Martin, J. A., Hamilton, B. E., Sutton, P. D., Ventura, S. J., Mathews, T. J., Kirmeyer, S., & Osterman, M. J. (2010). Births: Final data for 2007. *National Vital Statistics Report, Centers for Disease Control*, *58*(24), 1–85.

Martin, J. A., Hamilton, B. E., Sutton, P. D., Ventura, S. J., Menacker, F., & Munson, M. L. (2003). Births: Final data for 2002. *National Vital Statistics Report 2003*, *52*(10), 1–113.

Marx, G. F., Schwalbe, S. S., Cho, E., & Whitty, J. E. (1993). Automated blood pressure measurements in laboring women: Are they reliable? *American Journal of Obstetrics and Gynecology*, *168*(Pt. 1), 796–798.

Mayberry, L. J., Clemmens, D., & De, A. (2002). Epidural analgesia side effects, co-interventions, and care of women during childbirth: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S81–S93.

Mendelson, C. L. (1946). The aspiration of stomach contents into the lungs during obstetric anesthesia. *American Journal of Obstetrics & Gynecology*, *52*, 191–205.

Neilson, J. P. (2006). Fetal electrocardiogram (ECG) for fetal monitoring during labour. *Cochrane Database of Systemic Reviews*, (3). doi:10.1002/14651858.CD000116.pub2

Nguyen, U. S., Rothman, K. J., Demissie, S., Jackson, D. J., Lang, J. M., & Ecker, J. L. (2010). Epidural analgesia and risks of cesarean and operative vaginal deliveries in nulliparous and multiparous women. *Maternal and Child Health Journal*, *4*(5), 705–712.

Noakes, T. D. (1993). Fluid replacement during exercise. *Exercise and Sports Sciences Reviews*, *21*, 297–330.

O'Reilly, S. A., Perrone-Hoyer, P. J., & Walsh, E. (1993). Low-risk mothers: Oral intake and emesis in labor. *Journal of Nurse-Midwifery*, *38*(4), 228–235.

O'Sullivan, G., Liu, B., Hart, D., Seed, P., & Shennan, A. (2009). Effect of food intake during labour on obstetric outcome: Randomised controlled trial. *British Medical Journal*, *338*, b784. doi:10.1136/bmj.b784

Parsons, M., Bidewell, J., & Nagy, S. (2006). Natural eating behavior in latent labor and its effect on outcomes in active labor. *Journal of Midwifery & Women's Health*, *51*(1), e1–e6.

Pilliteri, A. (2010). *Maternal and child health nursing: Care of the childbearing and childrearing family* (6th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Polley, L. C., & Glosten, B. (2004). Epidural and spinal analgesia/anesthesia. In D. H. Chestnut, L. S. Polley, L. C. Tsen, & C. A. Wong (Eds.), *Obstetrics anesthesia: Principles and practice* (3rd ed., pp. 324–369). Philadelphia, PA: Mosby Elsevier.

Reinhard, J., Hayes-Gill, B. R., Yi, Q., Hatzmann, H., & Schiermeier, S. (2010). Comparison of non-invasive fetal electrocardiogram to Doppler cardiotocogram during the 1st stage of labor. *Journal of Perinatal Medicine*, *38*(2), 179–185.

Rooks, J. P. (1997). *Midwifery and childbirth in America*. Philadelphia, PA: Temple University Press.

Sakala, C., & Corry, M. P. (2008). Achieving the institute of medicine's six aims for improvement in maternity care. *Women's Health Issues*, *18*(2), 75–78.

Salim, R., Garmi, G., Nachum, Z., & Shalev, E. (2010). The impact of non-significant variable decelerations appearing in the latent phase on delivery mode: A prospective cohort study. *Reproductive Biology and Endocrinology*, *8*, 81. doi:10.1186/1477-7827-8-81

Scott, K. D., Klaus, P. H., & Klaus, M. H. (1999). The obstetrical and postpartum benefits of continuous support during childbirth. *Journal of Women's Health and Gender-Based Medicine*, *8*(10), 1257–1264.

Scupholme, A., McLeod, A. G., & Robertson, E. G. (1986). A birth center affiliated with the tertiary care center: Comparison of outcome. *Obstetrics and Gynecology*, *67*(4), 598–603.

Sholapurkar, S. L. (2010). Intermittent auscultation of fetal heart rate during labour—A widely accepted technique for low-risk pregnancies: But are the current national guidelines robust and practical? *Journal of Obstetrics and Gynaecology*, *30*(6), 537–540.

Singata, M., Tranmer, J., & Gyte, G. M. (2010). Restricting oral fluid and food intake during labour. *Cochrane Database of Systemic Reviews*, (1). doi:10.1002/14651858.CD003930.pub2

Skirton, H., Chamberlain, W., Lawson, C., Ryan, H., & Young, E. (2011). A systematic review of variability and reliability of manual and automated blood pressure readings. *Journal of Clinical Nursing*, *20*(5–6), 602–614. doi:10.1111/j.1365-2702-.2010.03528.x

Sommer, P. A., Norr, K., & Roberts, J. (2000). Clinical decision-making regarding intravenous hydration in normal labor in a birth center setting. *Journal of Midwifery & Women's Health*, *45*(2), 114–121.

Varney, H., Kriebs, J. M., & Gregor, C. L. (2004). *Varney's Midwifery* (4th ed.). Sudbury, MA: Jones and Bartlett.

Waldenström, U. (1999). Experience of labor and birth in 1111 women. *Journal of Psychosomatic Research*, *47*(5), 471–482.

Wong, C. A. (2009). Advances in labor analgesia. *International Journal of Women's Health*, *1*, 139–154.

World Health Organization. (1999). *Care in normal birth: A practical guide*. *Report of a technical work group*. Geneva, Switzerland: Author.

Untethering in Labor: Using the Evidence for Best Practice

11

Susan Yount and Meghan Garland

LIFE SATISFACTION WITH CHILDBIRTH EXPERIENCE

The document, *Principles of Perinatal Care,* released by the World Health Organization (WHO; as cited in Chalmers, Mangiaterra, & Porter, 2001) provides evidence-based principles of care for women and their infants. These principles include support of the woman and her partner, 1:1 care during the labor process, ambulation in labor, and appropriate monitoring. It includes intermittent auscultation (IA) and noninvasive assessment of labor progress, minimization of interventions, and vaginal exams limited to every 4 hours in normal labor (Chalmers et al., 2001). These principles help to "keep birth normal" (Albers, 2001, p. 371). Conversely, tethering a woman during labor often leads to a cascade of events that interfere with practicing the WHO principles and lead to high levels of technological intervention.

Maternal–infant outcomes and the cost-benefit ratio of multiple technological interventions have been the subjects of much research. Technological interventions have not been proven to necessarily enhance the safety of birth, the promotion of normal labor, or women's life satisfaction with their birthing experiences. On the contrary, many practices used on nearly all pregnant women were originally used to address certain problems that arose during the labor process and are now used on healthy women routinely, liberally, and without consideration of alternatives (Sakala & Corry, 2008).

Childbirth satisfaction is linked to a woman's sense of control during the birthing process. Women who report high rates of satisfaction describe feeling informed and being active participants in decision making, regardless of other variables (Knapp, 1996). A sense of loss of control is associated with dissatisfaction. It is also linked to postpartum depression and, in extreme cases, to posttraumatic stress disorder (PTSD). Beck (2004) describes classic PTSD symptoms among women who have experienced harrowing childbirth experiences, such as recurrent nightmares, flashbacks, anger, anxiety, depression, and a sense of isolation.

Measuring satisfaction, however, is inherently subjective and is affected by the time of questioning and who administers the instrument. Teasing out the variables in childbirth satisfaction is complex (Hodnett, 2002). For instance, women in extreme circumstances who give birth to unhealthy babies or experience complicated births may be satisfied with their birth experiences, regardless of the outcome. The crucial variable is sense of control. When a woman experiences a complication such as preterm labor, she may still feel satisfied *if* she has actively participated in the decision making and has retained a sense of control (Knapp, 1996). Minimal research has been done on the effects of technological interventions on women's life satisfaction with their childbirth experiences. Tethering may or may not contribute to a loss of sense of control, but there is a risk that it will. Connecting a laboring woman to multiple technologies tethers her to machines not to her caregivers. Intravenous (IV) lines and epidural catheters connect her to pumps, hoses, tether her to an automated blood pressure cuff, and cables attach her to the fetal monitor—all decreasing the likelihood of meaningful physical and emotional interaction with her care providers and her family (Hodnett, 2002).

Satisfaction is more powerfully linked to the attitudes and behaviors of caregivers than to the experience of pain, pain relief, or technological interventions. In particular, the attitudes of nurses and nurse-midwives are consistent, strong indicators of maternal satisfaction. Women also express higher rates of satisfaction if they are cared for in labor by someone familiar to them in a homelike birth setting. The persons who are providing labor support need to *be present* with the woman, allow the woman to express her feelings, accept her behaviors in labor, and offer encouragement as the woman works toward her vision of a satisfying birth. The introduction of a trained layperson, such as a doula, is a best practice, particularly in a hospital setting prone to high levels of technological intervention and commotion. In the hospital setting, nurse-midwives and nurses often care for more than one woman at a time and may not be able to provide continuous support. Even if attending to the needs of only one woman, the nurse or nurse-midwife may not be able to provide continuous support and manage the complicated technology simultaneously. Family members often lack the experience and objectivity necessary to provide effective continuous support. Some examples of ways a doula can provide support include

1. assisting the woman in movement and repositioning;
2. helping her in and out of a labor tub;
3. providing therapeutic presence and touch, lessening the need for pharmacological pain management; and
4. encouraging the family and interpreting information in nontechnical language.

The birth center or home birth setting is more conducive to providing an environment that encourages therapeutic presence by all caregivers, including midwives, nurses, doulas, and family members. However, in the United States, most births occur in hospitals, and doulas are excellent at bridging the need for therapeutic presence as well as being an adjunct to nursing and nurse-midwifery care, thus enhancing the midwifery model of care.

BEST PRACTICES FOR UNTETHERING IN LABOR

Hydration and Nutrition in Labor

Food and fluid have both physical and psychological importance for the laboring woman. Most women will drink to thirst and eat to appetite if provided a supportive environment and left to make these decisions. In the absence of an evidence-based reason, denying the laboring woman access to food and fluid of her choice can lead to increased stress and decrease in sense of control. Simkin (1986) surveyed postpartum women about stressors associated with childbirth. Approximately 25% identified restriction of food in labor as stressful, whereas more than 50% described restriction of oral fluids as stressful. Subsequent research has shown agreement with the connection between restriction of oral fluids and perceived stress in labor (Fowles, 1998). It is interesting to note that Fowles's research was conducted 2 months postpartum and the women remembered being thirsty in labor. Birth is a normal process, as are eating and drinking. In the absence of impending surgery, allowing the woman at low risk for complications to monitor how much and when to eat and drink gives her decision making during her labor. Ad lib eating and drinking during labor for low-risk women is a best practice in line with the WHO *Principles of Perinatal Care* and the midwifery model of care.

Vital Signs in Labor

Monitoring Maternal Vital Signs

A best practice to significantly increase freedom of movement for low-risk women in labor without impaired mobility (e.g., epidural placement) is to use the blood pressure equipment on the 4-hour regimen (per WHO recommendation) or as needed. Hypertensive women with epidural analgesia or oxytocin are more likely to have blood pressure fluctuations and need closer blood pressure monitoring. However, hourly or continuous blood pressure measurements serve no purpose in the absence of pathology and are not consistent with the recommendations of most professional organizations involved in maternity care. Excessive blood pressure readings are at least an annoyance and at most a tethering, detrimental intervention. This is especially true of the "double check" automated readings attached to short cables that restrict movement. These readings are frequently monitoring for nonexistent blood pressure problems. Increased mobility enhances the progress of labor and returns the decision to move to the woman. It is another *best practice* in tandem with the WHO *Principles of Perinatal Care* and the midwifery model of care (Chalmers et al., 2001).

Monitoring Fetal Well-Being During Labor

Continuous electronic fetal monitoring (EFM) is one of the most tethering and routine practices used in the United States with women at low risk for complications. Recommendations for EFM and IA for monitoring fetal heart rate (FHR)

vary across organizations, and outcomes with EFM are not superior to IA. The American College of Obstetricians and Gynecologists (ACOG, 2009) released the findings of a meta-analysis of randomized controlled trials (RCTs), showing no benefit of EFM over IA with women at low risk for complications or good evidence regarding recommended frequency and duration of IA. The present ACOG guidelines do not take a position in favor of either EFM or IA (ACOG, 2009). The American College of Nurse-Midwives (ACNM, 2010) supports IA as the preferred method for women with low-risk pregnancies, stating, "IA is the preferred method for monitoring the FHR during labor for women at term who at the onset of labor are low risk for developing fetal ischemia" (p. 401).

IA minimally disrupts a woman in labor and does not tether her to the EFM machine. It is a best practice supported by ACNM and unopposed by ACOG. It promotes the woman's ability to choose to move during labor. Why, then, is EFM the standard of care and usually required in hospital settings? One reason is the highly litigious environment in the United States; another is the "culture of safety," a perception that more technology protects birth outcomes (Conason & Pegalis, 2010).

Pain Management in Labor

Much of the tethering observed in typical hospital labor management stems from the use of pharmacological intervention. Fear of pain is grounded in cultural beliefs around childbirth in the United States. Caregivers often assume that optimal or total pain relief is very important to most laboring women and that those women who avoid pharmacological pain relief measures must be misinformed. However, a variety of studies in many countries more than 30 years have demonstrated that pain and pain relief are not major determinants of maternal satisfaction, unless expectations are not met. Pain experienced in normal, uncomplicated labor and birth does not appear to be the primary driver of maternal satisfaction (Hodnett, 2002).

Two large studies in the United Kingdom found that women who were anxious about labor had lower scores of childbirth satisfaction, whereas women who used no pain-relieving medications had the highest rate of satisfaction. There are no RCTs comparing pain management interventions that assess maternal satisfaction as an outcome (Hodnett, 2002).

In an analysis of 21 trials examining pain relief measures, Hodnett (2002) found that only three included childbirth satisfaction as a measured outcome. Those trials demonstrated no statistically significant effect between pain-relieving measures and maternal satisfaction. Eleven of the 21 trials revealed discordance between pain relief scores and satisfaction scores. None of the trials distinguished between expectations and preferences. Hodnett notes that the distinction between the expectations and preferences is important because expectations are based on knowledge, and having an active voice in decision making is a large predictor of maternal satisfaction. Preference, in contrast, is based on personal desires and can be a weaker determinant of satisfaction (for example, preference for a homelike environment). In addition, the author cautions that pain relief and satisfaction with pain relief are different issues altogether (Hodnett, 2002).

The Role of Labor Pain

Anthropologists have suggested that the purpose of pain in labor is to alert the woman that birth is imminent and to elicit caring behaviors among her support system (Lowe, 2002). However, the true role of pain, related to its character and purpose, is poorly understood (Wong, 2009). Unmitigated pain and anxiety have been well-documented causes of protracted dysfunctional labor due to excessive catecholamines, unbalancing the relationship between oxytocin and catecholamines in normal labor. Studies have also suggested that unmitigated, severe labor pain may contribute to postpartum depression and, in severe cases, to PTSD (Beck, 2004). However, it is clear from the literature that the overarching themes in the birth stories among women who have had harrowing experiences are loss of sense of control and poor communication around interventions and outcomes (such as, episiotomy, instrumental vaginal birth, emergent cesarean birth, or a damaged neonate). Only a small portion of women who suffer from depressive disorders postpartum or PTSD report that they experienced severe, unmitigated pain (Beck, 2004).

Pharmacologic Pain Management in Normal Labor

The efficacy and safety of parenteral opioid administration to control labor pain has not been demonstrated in the literature. Serious neonatal respiratory depression after opioid administration to laboring women has been well documented. The administration of co-drugs with opioids does not enhance efficacy and may potentiate undesirable side effects (Bricker & Lavender, 2002).

The evidence is convincing that epidural analgesia provides higher scores for pain relief and higher maternal satisfaction with pain relief in comparison to parenteral opioids, with or without mixture with co-drugs. The rate of instrumental vaginal delivery is higher with epidural analgesia compared to opioid administration and the second stage is slightly longer, but there is no difference in the cesarean birth rate (Leighton & Halpern, 2002). What is not known about pharmacological pain management is how it compares to nonpharmacological management in terms of childbirth satisfaction. It has been suggested that obtaining this kind of data through RCTs is unethical (Wong, 2009).

Although the administration of narcotics may not interfere with the ability of a laboring woman to ambulate, the potential side effects of nausea, vomiting, dizziness, and sedation make it less likely that she would choose mobility or that it would be safe for her to be out of bed. The inadequacy of nearly total pain relief and resulting maternal dissatisfaction increases the likelihood of epidural analgesia during labor.

Epidural analgesia for labor alters the physiology of labor and increases the risk for more adverse effects. Some of these adverse effects are voiding difficulty or inability, itching, longer pushing stage, more severe perineal tears, increased temperature, hypotension, and immobility (Sakala & Corry, 2008). Epidural analgesia has not been shown to be compatible with significant mobility during labor. This incompatibility is due to the tethering effect of multiple lines, the necessity to monitor FHR and maternal blood pressure continuously, ambulation difficulty

or impossibility, and difficulty changing positions in bed (Mayberry, Clemens, & De, 2002).

Barriers to mobility for women with epidural analgesia were identified in a survey of obstetrical nurses in five North American hospitals. These barriers included inadequate leg strength, physician resistance to the woman moving after epidural placement, lack of desire by the woman, and in some cases, lack of physical stamina necessary for ambulation or position change. Tethering (e.g., automated blood pressure cuff, EFM cables, IV line, and possibly a Foley catheter), in addition to the drug effect of the epidural analgesia, challenges mobility (Mayberry et al., 2002). Due to the effects of pharmacologic pain management, the woman is less capable of making decisions about her activity and movement in normal labor.

Nonpharmacologic Pain Management

Considering the numerous challenges to mobility during labor with the administration of pharmacological pain management and the cascade of interventions that change the character of normal labor into a pathological event, a strong case can be made for nonpharmacological management as best practice. There are safe, cost-effective, and potentially satisfying methods of nonpharmacologic pain management. Most nonpharmacological pain control measures used in labor either facilitate or require freedom of movement. Freedom of movement alone is an effective intervention for relief of pain in labor, facilitates optimum fetal positioning, and shortens the length of labor (Simkin & O'Hara, 2002).

Simkin and O'Hara (2002) reviewed studies with sufficient rigor to assess efficacy and safety in order to identify strategies of nonpharmacological pain relief. Five strategies were extrapolated from the literature, including

1. continuous labor support,
2. upright position,
3. change of position,
4. immersion in water, and
5. temporary pain reduction measures.

Continuous Labor Support

As childbirth moved from the home to the hospital, women lost the traditional support of other women during labor. It was not until the 1970s that fathers were invited into the labor room. The first studies examining the role of support in labor (defined as *continuous nonmedical care*) were published in the 1980s. Simkin and O'Hara (2002) found that continuous support provided by partners or other relatives can be problematic because they may lack objectivity and experience.

Labor support of the woman can at times be provided by a nurse or a midwife. However, unpredictable staffing and the necessity to sometimes step away from the support role to address a clinical problem or attend to another woman limits the ability of both the nurses and the midwives to provide continuous support. Continuous labor support by a trained layperson (such as a doula) was identified

as an effective pain-relieving strategy, especially for women laboring without strong family support.

A 2011 Cochrane review confirmed Simkin and O'Hara's (2002) findings. This review combined the results from 21 RCTs involving more than 15,000 women (Hodnett, Gates, Hofmeyr, Sakala, & Weston, 2011). Continuous labor support provided by women outside of the woman's social network such as doulas were the most effective (Hodnett et al., 2011).

The authors stated effective labor support was also apparent in settings where epidural analgesia is not routinely available. Women who received continuous labor support were more likely to have spontaneous vaginal birth and less likely to have interventions including regional analgesia, cesarean birth, or instrumental vaginal birth (Hodnett et al., 2011). Labors were shortened by a mean of 58 minutes. Satisfaction with the birth was noted to be greater. There were few low 5-minute Apgar scores, and the women were less likely to report dissatisfaction with their experience (Hodnett et al., 2011). Continuous labor support has meaningful benefits for women and infants and no known harm. Unfortunately, effective continuous labor support is the exception rather than the norm in U.S. obstetrical settings.

Upright Position

Maintenance of upright positioning in labor has demonstrated benefits for facilitating fetal descent, increasing uterine contractility, and shortening the length of labor. In their review, Simkin and O'Hara (2002) examined the research conducted by Caldeyro-Barcia in the 1950s and 1960s, which demonstrated that upright positioning during labor caused more frequent and stronger uterine contractions and facilitated cervical dilation. In a Cochrane review (2009), the authors found that various upright positions, commonly employed by laboring women in other countries, reduces the length of the first stage of labor as well as the need for epidural analgesia (Lawrence, Lewis, Hofmeyr, Dowswell, & Styles, 2009). Simkin and O'Hara (2002) noted that Caldeyro-Barcia's early studies did not address maternal pain perception in relation to position. Five studies that have addressed maternal pain perception used women as their own controls, asking them to rate labor pain in various positions: sitting versus side-lying and standing versus supine. None of the participants found supine positioning as comfortable as or more comfortable than any of the other alternatives (Simkin & O'Hara, 2002).

Changing Position

Cultural influences and maternal expectations influence behavior in labor including positioning. Culture informs a woman about birth position (e.g., kneeling, squatting, sitting, lying, or standing). The lithotomy position and flat dorsal positions for birth were American inventions dating back to the first half of the 1800s and are not evidence based (Dundes, 1987). Although it is now less common for women to birth flat on their backs, variations of the lithotomy position are still the most common positions for birth. Two observational studies in the 1980s of U.S. hospitals noted that, without specific nursing instruction, many laboring women moved around in

bed, yet few assumed upright positions or ambulated during labor (Carlson et al., 1986; Rossi & Lindell, 1986). Carlson et al. noted that the most common position assumed during the first stage of labor was lying on the left side frequently at double the rate of lying on the right side. Although the study was intended to observe the labor postures women would assume without coaching, it is likely that other cultural influences such as prior labor experience (either having given birth or observed a friend or family member labor), shared stories within the community, prenatal education classes, coaching by labor room personnel, and depictions of labor in popular culture influenced maternal posture rather than any natural inclination.

Epidural analgesia influences birth position. For women without epidurals, side-lying and upright positions were found to be associated with decreased severity of pain, fewer heart rate abnormalities for the fetus, shorter pushing phase, less use of episiotomies, and less use of interventions such as forceps and vacuum extraction for birth (Gupta, Hofmeyr, & Smyth, 2000). The culture of normal labor can influence women toward following what their body seeks as best.

Immersion in Water

The use of water as therapy in labor has become increasingly popular in the United States. Initial concerns over bathing with ruptured membranes have not been confirmed. Cluett and Burns (2009) in a Cochrane review reported there is no increased risk of maternal or neonatal infection from immersion in water during labor. The authors stated 11 RCTs ($n = 3000$ women) demonstrated a significant reduction in analgesia/anesthesia of all types when women used water immersion as a method of pain relief in labor. There was no difference between water birth versus land birth in perineal trauma, maternal/neonatal infection, score of 5-minute Apgar <7, or neonatal intensive care unit (NICU) admission (Cluett & Burns, 2009). Simkin and O'Hara (2002) reviewed seven RCTs and noted no difference in attempted water birth and land birth in the need for cesarean birth and instrumental vaginal delivery.

Simkin and O'Hara (2002) also reviewed the physiological changes that may contribute to the efficacy of water immersion during labor. Warmth and buoyancy release muscle tension and may create a sense of well-being that decreases catecholamine production facilitating labor progress especially in anxious women. Buoyancy promotes the freedom of movement and maternal positioning known to facilitate optimal fetal positioning. Hydrostatic pressure on peripheral tissues helps the fetus achieve and maintain a flexed position in direct proportion to the amount of surface area the woman has immersed. Fluid moves from peripheral tissues to the intravascular space, and blood is redistributed to the thorax. The expanded blood volume triggers the release of atrial natriuretic factor suppressing the production of vasopressin in the posterior pituitary gland. Because oxytocin is also produced by the posterior pituitary, it is possible that oxytocin is suppressed along with vasopressin, and this phenomenon may account for the gradual slowing of labor noted when water immersion lasts longer than 90 minutes. This theory may also explain why immersion in early labor (less than 5 cm) might slow labor progress (Simkin & O'Hara, 2002).

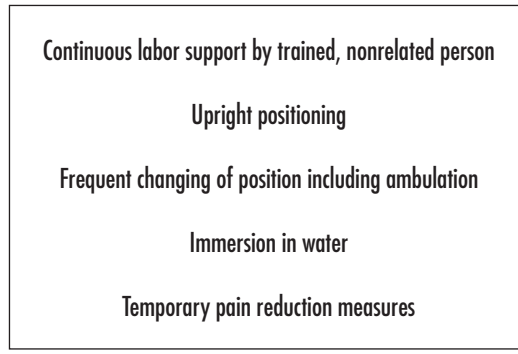
The authors recommended that water temperature should be at body temperature to avoid a rise in maternal core body temperature. The woman should immerse herself to cover her abdomen but leave the shoulders and upper chest exposed to facilitate heat dissipation while maintaining buoyancy and warmth. Bathing episodes should be limited to 90 minutes to prevent oxytocin suppression (Simkin & O'Hara, 2002). The Cluett and Burns (2009) Cochrane review noted that recent studies examining this issue have not had sufficient statistical power to assess whether these guidelines are needed. Water immersion is a drug-free measure that reduces labor pain and not only allows freedom of movement but also enhances movement.

Temporary Pain Reduction Measures

Simkin and O'Hara (2002) reviewed nonpharmacological pain relief that provided temporary pain reduction and were perceived positively by laboring women. These measures included touch/massage and intradermal sterile water injections over the sacrum. Simkin and O'Hara (2002) concluded these measures provided temporary relief or reduction in labor pain, reduction in the use of pain medication, simplicity of application, a high degree of safety, and high rates of maternal satisfaction. Recent temporary nonpharmacologic measures investigated in a Cochrane review included self-hypnosis and acupuncture (Smith, Collins, Cyna, & Crowther, 2006). The authors concluded that hypnosis decreases the need for labor augmentation, increases the incidence of spontaneous vaginal birth, and has a high rate of maternal satisfaction. Acupuncture may decrease the need for analgesia, including epidural analgesia, as well as oxytocin augmentation, but differences in needling techniques decreased the strength of these conclusions. The authors proposed that it is likely that using more than one of these techniques sequentially or simultaneously may provide greater pain relief and enhance maternal satisfaction (Simkin & O'Hara, 2002; see Figure 11.1).

FIGURE 11.1

Nonpharmacologic best practices associated with mobility, pain reduction, and maternal satisfaction.



Adapted from Simkin, P. P., & O'Hara, M. (2002). Nonpharmacologic relief of pain during labor: Systematic reviews of five methods. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S131–S159.

Freedom of movement alone is an effective intervention for relief of pain in labor. Historically and cross-culturally, women find comfort by changing positions in labor (Simkin & O'Hara, 2002). All nonpharmacological interventions reviewed have demonstrated safety, efficacy, and high rates of maternal satisfaction. They are cost effective and represent best practices in implementing the WHO *Principles of Perinatal Care* and the midwifery model of care (Chalmers et al., 2001).

IMPLEMENTING CHANGE FOR BEST PRACTICES

Historically, health care policy makers and care providers have responded to public demands in the provision of services. The public demand for less medicated birth in the 1960s and 1970s and the birth center movement are examples of these demands. Co-opting the term "birth center" into highly medicalized birthing environments has created the illusion of a culture of safety. It exemplifies the dominant paradigm of pharmacological pain management, tethering a woman. It creates an illusion of safety rather than actual increased safety. This illusion needs to be confronted in order to provide a truly optimal and safe birth environment, one that promotes the normalcy of birth. The conversation among all stakeholders including providers, institutions, insurance carriers, childbearing women, and their families needs to center on optimal outcomes rather than expediency and litigation prevention.

Women should have options for childbirth that empower them to make informed decisions about risk and choice. There is clear and convincing evidence that tethering a woman to cables and hoses restricts her freedom of movement, her decision making in childbirth, her chances for a normal birth, and optimal healthy outcomes for her baby and herself. When an intervention may create a cascade of escalating interventions, possible consequences need to be addressed.

A laboring woman's experience of pain does not necessitate an immediate movement to epidural placement. The solution to pain depends on the root of her pain. If her baby is malpositioned or she is anxious, a low-risk intervention or a doula, nurse, or midwife helping the woman immerse herself in a warm bath may facilitate optimal fetal positioning and pain reduction that allows labor to proceed normally. At least this evidence-based measure deserves an attempt, as the first line of therapy, before escalating to potentially risky interventions.

Many participants in the Listening to Mothers II survey provided favorable ratings for the use of drug-free measures of pain relief such as tubs, hot or cold objects, showers, or birthing balls (Declercq, Sakala, Corry, & Applebaum, 2007). The current culture of safety is as much safety from litigation and inconvenience as it is evidence-based safety for mother and child. Resistance to change is likely to be encountered among those who have a stake in high technology and convenience.

Hollis Martin (2008) cites several common mistakes made by change agents in trying to address innovations that threaten the existing status quo:

1. The purpose of innovation is not clear.
2. Participants are not involved in planning.
3. The appeal is personal rather than professional.
4. The habits of the group involved are ignored.

5. There is poor communication regarding implementation, fear of failure, and potential increase in work pressure.
6. The financial cost is too high for the anticipated reward.
7. The status quo appears satisfactory.

Daniels, Lewin & Practice Policy Group (2011) used a qualitative case study approach to examine how South Africa implemented an evidence-based, system-wide obstetrical care in the face of an entrenched system in this low-income, politically divided country. They describe a process by which evidence-based practice became normative in the obstetric culture. The diffusion and acceptance of evidence-based care was facilitated by contact between local obstetricians and international researchers who promoted the findings of the Cochrane reviews and the earlier Oxford Database of Perinatal Trials. Further interest and acceptance was stimulated through existing professional networks and meetings, sharing ideas, and encouraging local researchers to contribute to the growing body of evidence-based care. As interest in evidence-based practice grew, locally organized conferences introduced new ideas around evidence-based care. Regular conference attendance by health care providers resulted in a national network of researchers who carried the concept of evidence-based practice into their academic institutions and in so doing acculturating the next generation of providers. Including local hospitals and obstetric providers in developing a body of evidence-based knowledge created an environment where change was actively generated rather than passively received.

In 1994, the election of South Africa's first democratically elected government brought changes in health care policy at the national level, one that implemented evidence-based care. Today, South Africa has experienced a cultural shift—maternal health policies that are strongly evidence based. Over time, the phrase "evidence-based practice" became associated with being modern, and opinion-based practices considered old fashioned. However, questions about the role of clinical judgment remained. Daniels, Lewin & Practice Policy Group (2011) interviewed one academic researcher who expressed concern that evidence-based care did not provide sufficient accommodation for individual circumstances and that it negated clinical judgment. Along with the growth of evidence-based care from RCT data, there has been a wider and emerging acceptance of the value of various types of information, including preferences of health care consumers, providers, and stakeholders (Daniels, Lewin & Practice Policy Group, 2011).

Daniels, Lewin & Practice Policy Group identified several factors that contributed to the successful implementation of evidence-based practice into South African maternity services. One is presence of a fairly large number of senior, locally trained academics who were highly motivated to implement change. The second factor was advocacy for the spread of evidence from RCTs and systematic reviews as well as personal contact between policy makers and researchers, which promoted the uptake of evidence. Lastly, South Africa, to its credit, has made a determined effort to end the academic isolation imposed by apartheid. There are powerful lessons learned from the South African experience and are informative in framing the discussion around tethering women in labor (Daniels, Lewin & Practice Policy Group, 2011).

The U.S. culture of birth has much to learn about tethering in labor. With more than 82% of childbearing women presenting in labor as at low risk for complications,

the nation's providers have chosen a flawed management path toward healthy, safe, low-intervention labors and births. Statistical evidence indicates that most labors can be supported and managed with low intervention. Only one mother in six will need more intensive and interventive labor management (Sakala & Corry, 2008). In the United States, the number of women at low risk for complications subjected to tethering interventions and restrictions is staggering. Medical interventions disrupt the normal course of the physiological capacities of the childbirth process (Odent, 2001).

Health care providers in South Africa have planned, implemented, and succeeded in integrating evidence-based practice into their health care system. The providers in the United States have sufficient evidence-based research to support bringing birth back to the woman and her family. Health care providers need to support childbearing women and their infants to experience the innate, hormonally driven birth process the body has been intended to accomplish. Benefits for mother, infant, and family will follow. To then stand back, wait, and watch the dance of labor and birth will be much more rewarding and rehumanize the process of birth itself.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 11.1

Untethering in Labor: Outcome and Maternal Satisfaction

Samantha is a 25-year-old gravida 2 para 1 woman at 39 weeks 3 days gestation. She arrives at the hospital in latent first stage labor. She denies spontaneous rupture of membranes or vaginal bleeding and reports good fetal movement. She is accompanied by her husband and her doula. Her nurse-midwife determines she is 6-cm dilated, 90% effaced, and −1 station with bulging bag of waters. Her contractions are moderate to strong by palpation, and she rates her pain 8 out of 10. She is admitted for labor care and is assigned a nurse who is currently caring for a woman who gave birth about 2 hours ago. Samantha's husband reports he is relieved that she is being admitted because he wanted to come to the hospital hours ago, but Ginny, their doula, explained that Samantha should have to stop and breathe with each contraction while ambulating at home before coming to the hospital.

Samantha is given a choice of either wearing her own clothes or the hospital's gown. The nurse listens to fetal heart tones per intermittent monitoring protocol and takes Samantha's vital signs, explaining to Samantha that her blood pressure should be assessed again in 4 hours and fetal heart tones should be assessed again in 1 hour. Samantha's nurse brings her a water pitcher and offers food stuffs and juice from the unit kitchen. She orients Samantha, her husband, and the doula to the room and encourages her to sit, stand, ambulate, bathe, or walk in the hallways as she pleases. Samantha's nurse-midwife remains on hand, assesses Samantha's comfort, and answers questions. She encourages Samantha to use a variety of positions and bathing to facilitate labor and increase comfort while

(continued)

CASE STUDY *(continued)*

assisting Samantha to position herself on a birthing ball. After 4 hours of active laboring while alternating bathing, walking, and resting, Samantha gives birth to an 8 lb male infant with Apgar score of 9/9.

Exemplar of Best Practice

Samantha benefited from continuous labor support by a family member and a trained doula of her choice. She was admitted when clearly in active labor. Her nurse and nurse-midwife fully informed her of their plan of care and assessed her sense of well-being as well as her physical needs for comfort and sustenance. Evidence-based practices were used to manage her discomfort, including frequent position changes, a variety of nonpharmacological pain mitigating measures, oral intake, and appropriate monitoring of maternal and fetal vital signs.

REFERENCES

Albers, L. L. (2001). Monitoring the fetus in labor: Evidence to support the methods. *Journal of Midwifery & Women's Health*, *46*(6), 366–373.

American College of Nurse-Midwives. (2010). Intermittent auscultation for intrapartum fetal heart rate surveillance (Clinical Bulletin No. 11). *Journal of Midwifery & Women's Health*, *55*(4), 397–403.

American College of Obstetricians and Gynecologists. (2009). *Intrapartum fetal heart rate monitoring: Nomenclature, interpretation, and general management principles* (Practice Bulletin No. 106). *Obstetrics & Gynecology*, *114*(1), 192–209.

Beck, C. T. (2004). Post-traumatic stress disorder due to childbirth: The aftermath. *Nursing Research*, *53*(4), 216–224.

Bricker, L., & Lavender, T. (2002). Parenteral opioids for labor pain relief: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S94–S109.

Carlson, J. M., Diehl, J. A., Sachtleben-Murray, M., McRae, M., Fenwick, L., & Friedman, E. A. (1986). Maternal position during parturition in normal labor. *Obstetrics and Gynecology*, *68*(4), 443–447.

Chalmers, B., Mangiaterra,V., & Porter, R. (2001). WHO principles of perinatal care: The essential antenatal, perinatal, and postpartum care course. *Birth*, *28*(3), 202–207.

Cluett, E. R., & Burns, E. (2009). Immersion in water in labour and birth. *Cochrane Database of Systematic Reviews*, (2), CD000111. doi:10.1002/14651858.CD000111.pub3

Conason, R. L., & Pegalis, S. E. (2010). Neurologic birth injury. Protecting the legal rights of the child. *The Journal of Legal Medicine*, *31*(3), 249–286.

Daniels, K., Lewin, S., & Practice Policy Group. (2011). The growth of a culture of evidence-based obstetrics in South Africa: A qualitative case study. *Reproductive Health*, *8*(5), 1–9.

Declercq, E., Sakala, C., Corry, M., & Applebaum, S. (2007). Listening to mothers II: Report of the second national U.S. survey of women's childbearing experiences. *Journal of Perinatal Education*, *16*(4), 9–14. doi:10.1624%2F105812407X244769

Dundes, L. (1987). The evolution of the maternal birthing position. *American Journal of Public Health*, *77*(5), 636–641.

Fowles, E. R. (1998). Labor concerns of women two months after delivery. *Birth*, *25*(4), 235–240.

Gupta, J. K., Hofmeyr, G. J., & Smyth, R. M. D. (2000). Position in the second stage of labour for women without epidural anesthesia. *Cochrane Database of Systemic Reviews*, (1), CD002006. doi:10.1002/14651858.CD002006.pub2

Hodnett, E. D. (2002). Pain and women's satisfaction with the experience of childbirth: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S160–S172.

Hodnett, E. D., Gates, S., Hofmeyr, G. J., Sakala, C., & Weston, J. (2011). Continuous support for women during childbirth. *Cochrane Database of Systemic Reviews*, (2), CD003766. doi:10.1002/14651858.CD003766.pub3

Hollis Martin, C. J. (2008). Triumph over the barricades and put the evidence into practice. *British Journal of Midwifery*, *16*(2), 76–81.

Knapp, L. (1996). Childbirth satisfaction: The effects of internality and perceived control. *Journal of Perinatal Education*, *5*(4), 7–16.

Lawrence, A., Lewis, L., Hofmeyr, G. J., Dowswell, T., & Styles, C. (2009). Maternal positions and mobility during first stage labour. *Cochrane Database of Systematic Reviews*, (2), CD003934. doi:10.1002/14651858.CD003934.pub2

Leighton, B. L., & Halpern, S. H. (2002). The effects of epidural anesthesia on labor, maternal and neonatal outcomes: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S69–S77.

Lowe, N. K. (2002). The nature of labor pain. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S16–S24.

Mayberry, L. J., Clemmens, D., & De, A. (2002). Epidural analgesia side effects, co-interventions, and care of women during childbirth: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S81–S93.

Odent, M. (2001). New reasons and new ways to study birth physiology. *International Journal of Gynaecology and Obstetrics*, *75*(Suppl. 1), S39–S45.

Rossi, M. A., & Lindell, S. G. (1986). Maternal positions and pushing techniques in a non-prescriptive environment. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *15*(3), 203–208.

Sakala, C., & Corry, M. P. (2008). *Evidence-based maternity care: What is it and what it can achieve*. *The Milbank Report*. Retrieved from http://www.milbank.org/reports/0809MaternityCare/0809MaternityCare.html

Simkin, P. P. (1986). Stress, pain, and catecholamines in labor: Part 2. Stress associated with childbirth events: A pilot survey of new mothers. *Birth*, *13*(4), 234–240.

Simkin, P. P., & O'Hara, M. (2002). Nonpharmacologic relief of pain during labor: Systematic reviews of five methods. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S131–S159.

Smith, C. A., Collins, C. T., Cyna, A. M., & Crowther, C. A. (2006). Complementary and alternatives therapies for pain management in labour. *Cochrane Database of Systematic Reviews*, (4), CD003521. doi:10.1002/14651858.CD003521.pub2

Wong, C. (2009). Advances in labor analgesia. *International Journal of Women's Health*, *1*, 139–154.

The Limits of Choice: Elective Induction and Cesarean Birth on Maternal Request

12

Kerri D. Schuiling and Joan K. Slager

CONTROVERSIAL ISSUES AND CHOICE

The midwifery model of care frames childbirth as a normally occurring event in women's lives. Within the context of normal childbearing, midwives have held fast to the belief that less intervention is better for both mother and baby. Unfortunately, in our society, birth is often viewed as risky, and technology as reliable and progressive. Technological advanced care is often confused with the highest standard of care (Christilaw, 2006). Today, childbirth in the United States is occurring within a technocratic context where interventions such as induction of labor and cesarean delivery on maternal request (CDMR) are almost normalized. Cesarean birth, a technologic intervention, is accepted by some as the answer to problems of fear of childbirth pain (Hewer, Boschma, & Hall, 2009).

The number of cesarean births has risen steadily for more than a decade and is approximately 50% higher than it was in 1996 (Centers for Disease Control and Prevention [CDC]/National Center for Health Statistics [NCHS], 2008) and has increased by more than 70% in six states from 1996 to 2007 (Menacker & Hamilton, 2010). Accompanying the rise in cesarean births is the fact that induction of labor is seemingly commonplace. The widespread acceptance of scheduling "social inductions" has fallen under the scrutiny of many quality organizations because of the relation to cesarean birth and birth of a premature infant (Beebe, Beaty, & Rayburn, 2007; Vardo, Thornburg, & Glantz, 2011). Complications due to prematurity result in significant perinatal morbidity and mortality as well as emotional and physical costs to parents and society.

Induction of labor results in increased health care costs, frequently longer labor, and may increase the potential for morbidity for both mother and baby, thus contributing to longer hospital stays. The cascade of increased costs continues because the associated increase in adverse outcomes often results in litigation (Simpson & Atterbury, 2003).

This chapter presents the discourse and current research around elective induction of labor (EIOL) and CDMR. Current evidence for best practices is provided as a foundation for decision making about clinical practice. The ethics of choice and the meaning of risk are explored.

ELECTIVE INDUCTION OF LABOR

EIOL is becoming one of the more common obstetrical procedures in the United States. Statistics suggests that 22% to 34% of women in the United States who are pregnant will have their labors induced (Lydon-Rochelle et al., 2007; Martin et al., 2009). However, the number of women who have their labors induced may be overestimated. The rates of induction without medical indication are typically derived from birth certificate data. Balit and the Ohio Perinatal Quality Collaborative (2010), in a study representing 20 hospitals, found that birth certificates overestimated rates of elective induction by about 10%. Nonetheless, it is clear that a significant number of childbearing women experience induced labor.

Elective induction is labor that is induced in the absence of standard medical indications (Lydon-Rochelle et al., 2007). It occurs for a variety of nonmedical reasons (such as, potential for rapid labor, distance from hospital, psychosocial indications; American College of Obstetricians and Gynecologists [ACOG], 2009). Women may wish to end their pregnancies because of physical discomforts, history of rapid labors that may preclude timely arrival at the hospital, arriving at the hospital too late for epidural placement, scheduling issues, and timing of available family support.

Decision making about whether to induce labor electively should include weighing the risks against the benefits. When the benefits of a facilitated birth outweigh the risks of continuing the pregnancy, it is reasonable to consider elective induction (Agency for Healthcare Research and Quality [AHRQ], 2009). Regardless of the reason for EIOL, the ACOG (2009) recommends confirmation that the fetus is at term or that the fetal lungs are mature prior to EIOL. Further, the ACOG states that EIOL should not occur prior to 39 completed weeks of gestation regardless of the outcome of fetal lung maturity testing (ACOG, 2009).

There is concern about the increasing number of elective inductions because of the associated risks, particularly preterm birth (March of Dimes, 2008). Although there are a variety of ways to date a pregnancy, validating whether a pregnancy is at term (37–42 weeks of gestation) is still not certain. EIOL at term for nulliparous women is associated with increased risk for cesarean birth, postpartum hemorrhage, neonatal resuscitation, increased hospital costs, and longer lengths of stay without improvement of neonatal outcomes (Ehrenthal, Jiang, & Strobino, 2010; Kaimal et al., 2011; Maslow & Sweeny, 2000; Vardo et al., 2011).

Infants between the gestational ages of 37 +0/7 to 39 completed weeks of gestation are often erroneously considered term by the general public, thus meeting the fetal requisites for EIOL or planned cesarean birth. The evidence suggests otherwise. A study of 12,821 infants born by elective cesarean birth at 37 completed weeks of gestation revealed that these infants had a two- to fourfold

increase in neonatal complications compared to those born at 39 completed weeks of gestation (Tita et al., 2009). Complications included respiratory distress requiring admission to the neonatal intensive care unit (NICU), sepsis, and hypoglycemia. Even those infants born at 38 and 4/7 weeks experienced statistically significant higher morbidity than infants who had completed 39 weeks' gestation (Tita et al., 2009).

The American College of Nurse-Midwives (ACNM) takes the position that induction of labor should be offered to women only for medical indications, supported by scientific evidence that the benefit of birth outweighs the risk of prematurity. Furthermore, the ACNM (2010) identifies that spontaneous labor offers substantial benefits to the mother and her newborn and that disruption of the normal process without a medical indication actually represents a risk for potential harm.

The Evidence

A retrospective study using record review of 1135 women with singleton pregnancies at low risk for complications (vertex presentation between 38 and 41 weeks of gestation and eligible for vaginal birth) revealed that the majority of the women ($n = 872$) had spontaneous labor. Among those women who had their labors induced ($n = 263$), there was a significantly increased risk for cesarean birth (Maslow & Sweeny, 2000). In addition, those women who had labor induced followed by vaginal birth still incurred higher hospital costs ($273 and higher) and longer stays in the hospital than non-induced vaginal births (Maslow & Sweeny, 2000).

The Bishop score is a scoring system commonly used by maternity providers to assess the readiness of the cervix for labor. This score is based on the station of the fetal head, the dilatation and effacement of the cervix, the position of the fetus, and the consistency of the cervix. Each of these factors receives a score ranging from 0 to 3, for a maximum score of 9. A Bishop score of 7 or greater suggests a favorable cervix ready for labor.

A larger retrospective chart review study of nulliparous women at term with a singleton fetus in the vertex position ($n = 7804$) revealed that labor induction was significantly associated with cesarean birth (Ehrenthal et al., 2010). When a nulliparous woman with an unfavorable cervix (Bishop score ≤ 6) undergoes induction of labor, her risk of cesarean birth doubles (ACOG, 2009). A recent retrospective chart review of nulliparous women ($n = 485$) with singleton pregnancies at term revealed a 33.6% cesarean birth rate and found that EIOL was significantly related to increased length of stay, epidural use, postpartum hemorrhage, and neonatal oxygen requirement (Vardo et al., 2011).

The AHRQ sponsors evidence-based, peer-reviewed reports through its evidence-based practice centers (EPCs). A large systematic review was undertaken to answer four key questions around EIOL:

1. What evidence describes the maternal risks of elective induction versus expectant management?
2. What evidence describes the fetal/neonatal risks of elective induction versus expectant management?

3. What is the evidence that certain physical conditions/patient characteristics are predictive of a successful induction of labor?
4. How is a failed induction defined? (Caughey, Sundaram, Kaimal, Cheng et al., 2009)

The initial literature search identified 3722 potentially relevant articles of which 76 met inclusion criteria. Nine were randomized controlled trials (RCTs) comparing expectant management with EIOL. This study stands out from others because EIOL is compared with expectant management, not spontaneous labor. The researchers explain that comparing EIOL with spontaneous labor is problematic because

> at any point in the management of women with a term gestation, the clinician has the choice between induction of labor and expectant management, not spontaneous labor. Expectant management of the pregnancy involves nonintervention at any particular point in time and allowing the pregnancy to progress to a future gestational age. Thus, women undergoing expectant management may go into spontaneous labor or may require indicated induction of labor at a future gestational age. (Caughey, Sundaram, Kaimal, Cheng et al., 2009, p. v)

These researchers posit that comparing EIOL with spontaneous labor is a fundamental flaw and can lead to misleading conclusions (Caughey, Sundaram, Kaimal, Cheng et al., 2009).

A systematic review by Caughey, Sundaram, Kaimal, Cheng et al. (2009) and Caughey, Sundaram, Kaimal, Gienger et al. (2009) found that expectant management of pregnancy was associated with 22% higher odds of cesarean birth than EIOL and a 50% higher risk of meconium-stained amniotic fluid. The majority of studies that were included in the meta-analysis focused on women who were pregnant at 41 weeks' gestation or beyond. In addition, women who were expectantly managed were more likely to have meconium-stained amniotic fluid than their EIOL comparisons. However, the observational studies that were included showed a consistently lower risk of cesarean birth for women who had EIOL. Thus, the primary finding of the systematic review suggests that EIOL at 41 weeks' gestation may be associated with a decrease in the risk of cesarean birth and meconium-stained amniotic fluid (Caughey, Sundaram, Kaimal, Gienger et al., 2009).

Keirse (2010) calls into question the definition of EIOL as defined by Caughey, Sundaram, Kaimal, Gienger et al. (2009) in their systematic review. Caughey, Sundaram, Kaimal, Gienger et al. define EIOL as "induction of labor without a medical indication," but Keirse points out that the authors advise that EIOL may be done for "ending the ongoing risk for complications in the pregnancy" and to "limit their patients' physical risks" (p. 1). Keirse begs the question whether medical inductions occur only for patient comfort. This author further suggests that ACOG has ordained weeks of gestation as a medical indication for induction (Keirse, 2010).

Berghella, Blackwell, Ramin, Sibai, and Saade (2011) conducted a search of the MEDLINE database using the terms "elective" and "obstetrics." They found more than 2200 publications that included both terms, revealing that elective was used most often in relation to surgical intervention as opposed to medical

procedures. They posit that the term elective lacks scientific specificity. The authors of this study suggest that the term elective be deleted and that clinicians carefully document the specific indication for induction. If the terms elective and "medically indicated" are used, they state that there must be agreement on scientific definitions (Berghella et al., 2011).

King, Pilliod, and Little (2010) conducted a systematic review on EIOL that included meta-analyses of RCTs and other study designs since 1999. They compared expectant management (awaiting spontaneous labor between 37 and 41 weeks) until labor occurred with EIOL. There were several limitations reviewed including the small number of studies that focus on EIOL in women at low risk of complications between 37 and 41 weeks' gestation. In addition, these studies are older and did not include parity or cervical status. Four key questions were addressed in this review:

1. What are the benefits and harms of elective induction of labor at term (37–41 weeks of gestation) compared with expectant management?
2. Do the benefits and harms of elective induction of labor at term vary by gestational age, or other maternal or fetal characteristics?
3. What are the appropriate medical indications for induction of labor?
4. What are potential ways to reduce elective inductions of labor? (King et al., 2010, p. 1)

The findings of this review suggest significant risks associated with EIOL, although the risk of cesarean birth was not found to be significant except in nulliparous preterm women with low Bishop scores. The findings from this study are identified in Table 12.1.

TABLE 12.1

Findings From the Medicaid Evidence-Based Decisions Project: Elective Induction of Labor

Finding	Strength of Evidence
No increase or slight increase in cesarean birth	Low
Some evidence of increased risk of operative vaginal birth	Low
Observational studies suggested increased risk of cesarean birth for nulliparous women, especially with low Bishop scores	Moderate
EIOL prior to 39 weeks increased risk of infant being admitted to NICU	Moderate
Length of labor may be shorter but hospital stay may be longer	Very low
The most commonly cited indications for induction of labor are not well supported by evidence; only the indications of a gestational age beyond 41 weeks and pre-labor rupture of membranes at term are supported by strong evidence of net benefit	High
Quality improvement programs targeted at eliminating inappropriate EIOL can be effective in reducing cesarean birth outcomes, particularly for women who are nulliparous with a low Bishop score	Moderate

Note. EIOL = elective induction of labor; NICU = neonatal intensive care unit.

Adapted from *Medicaid evidence-based decisions project: Rapid review of elective induction of labor*, by V. J. King, B. S. Pilliod, and A. Little, 2010, Portland, OR: Oregon Health & Science University.

Wilson (2007) used a retrospective descriptive correlation design with 1325 women, 43.6% of whom were primiparous scheduled for induction at a large tertiary hospital. Birth outcomes were matched against hospital induction logs to verify the reason for the induction. The findings revealed that primiparous women had a significantly increased likelihood of cesarean birth. Independently, EIOL increased the probability of cesarean birth by 50%. The risk of cesarean birth appeared to increase with age. After age 35, the risk of cesarean birth for primiparous women increased approximately 5% per year. The limitations of this study are that cervical status at the time of induction was unknown and all births occurred at the same hospital, therefore not allowing for generalization of the results (Wilson, 2007).

Methods used to induce labor include mechanical methods, for example, prostaglandins to ripen the cervix and sweeping of membranes, hoping to bring on labor. Pharmacologic methods include oxytocin and misoprostol to initiate labor. Oxytocin is one of the more common and oldest drugs used to induce labor. Recent reports warn about the hazards associated with oxytocin, the drug most commonly associated with preventable adverse outcomes. The Institute for Safe Motherhood and the Institute for Safe Medication Practices designated intravenous oxytocin as a "high-alert medication" and has added it to a list of pharmacologic agents with risk that may necessitate increased safety measures (Clark, Simpson, Knox, & Garite, 2009; Simpson & Knox, 2009). The ACOG (2009) recommends that oxytocin be used only by clinicians who are educated about its use and familiar with its effects. The maximum safe dose of oxytocin has not been established, and clinicians are encouraged to use the least amount of drug to effect labor stimulation. Furthermore, the ACOG encourages hospitals to develop guidelines for the preparation and administration of oxytocin (ACOG, 2009).

Women will continue to request EIOL. It is the clinician's responsibility to provide education that is informative, accurate, and evidence based. Simpson, Newman, and Chirino (2010a) surveyed 1349 women about their attendance at prepared childbirth classes and their experience with labor and birth. The purpose of the study was to explore reasons nulliparous women gave for requesting EIOL. Interestingly, 63% of the women who attended childbirth education classes and who did not request EIOL stated that their childbirth educators provided helpful information to assist them in their decision making. Women also identified their physicians as a powerful influence on their decision making about requesting EIOL. Women were more likely to have EIOL if their physician suggested it.

A study of women who attended childbirth education viewed a specially developed video about the risks and benefits of EIOL. They were compared with women who did not attend the classes and did not view the EIOL video. Findings revealed that elective induction rates differed significantly based on class attendance (Simpson, Newman, & Chirino, 2010b).

CESAREAN DELIVERY ON MATERNAL REQUEST

In the developing world, low cesarean birth rates often reflect poor access to care. However, in a high-resource country, such as the United States, there is concern about the escalating rates of cesarean birth (Plante, 2006). The CDC provides

annual data on the number of births and trends in mode of birth. In 2008, the most recent year for which definitive birth data are available, there were a total of 4,247,694 births. Of this total 2,864,343 were vaginal births, and 1,369,273 were cesarean birth (the method of birth was not identified in 14,078 births). Cesarean birth represented 32% of the births (CDC/NCHS, 2008). One mother in three will have a cesarean birth.

Some of the increase in cesarean births may be due to an increase in both EIOL and CDMR, defined as a cesarean birth at term for a singleton pregnancy upon maternal request in the absence of medical indications (National Institutes of Health [NIH], 2006). The ACOG (2007) qualifies the definition by defining CDMR as a *primary* cesarean birth upon maternal request in the absence of any medical or obstetrical indication.

The ACNM takes the position that the practice of CDMR is not supported by scientific evidence, and that without an evidence base to endorse CDMR, there is potential for harm. Therefore, the ACNM (2005) endorses vaginal birth is the optimal mode of birth for women who do not have a medical indication for a cesarean birth. Conversely, the ACOG (2007) takes the position that there is neither sufficient evidence to compare the benefits and risks of CDMR with vaginal birth or a basis to recommend either mode of birth. The ACOG makes the following recommendations:

1. CDMR should not be performed prior to 39 weeks' gestation;
2. CDMR should not be motivated by the unavailability of pain medication; and
3. CDMR is not recommended for women desirous of having several children due to the risks of placenta previa, accreta, and gravid hysterectomy that increase with each cesarean birth (p. 3).

The Evidence

There are few studies on CDMR or on maternal–fetal outcomes after CDMR. Recognizing the need for more knowledge about CDMR and the health outcomes of mothers and babies, the NIH convened a state-of-the-science conference on CDMR in 2006. A panel of 18 individuals (nonaligned with the Department of Health and Human Services and representing medicine, nursing, midwifery, reproductive physiology, public health sciences, and other disciplines) conducted and presented systematic reviews (NIH, 2006). The following are the conclusions of this conference:

1. The incidence of cesarean birth without a medical indication is increasing in the United States in part due to CDMR;
2. The evidence is insufficient to fully evaluate the benefits and risks of CDMR;
3. Until there is quality evidence available, decisions around CDMR should be individualized and consistent with ethical principles;
4. CDMR is not recommended for women who desire several children because of the associated risks of cesarean birth (e.g., placenta previa, placenta accreta);
5. Because of the significant neonatal risks of respiratory complications prior to 39 completed weeks of gestation, CDMR should not be performed prior to 39 weeks;

6. CDMR should not be motivated because of unavailability of effective pain relief; and
7. The NIH or another federal agency should establish and maintain a website that provides up-to-date information on the benefits and risks related to mode of birth (NIH, 2006).

Risser and King (2010) conducted a systematic review of studies on elective cesarean birth and CDMR. The goal was to provide answers to three key questions:

1. What are the benefits and harms of elective cesarean birth compared with spontaneous labor or elective induction?
2. Do the benefits and harms of elective cesarean birth at term vary by gestational age or other maternal or fetal characteristics?
3. What are the appropriate medical indications for planned cesarean birth?

In many of the studies, proxies were used for elective cesarean birth and CDMR because the intended birth route was not identified or was too difficult to determine. This is important when using the results of the study because of the inherent methodological issues in using proxies. Therefore, recommendations must be weighed against the limitations of the study. The primary findings suggest that neonatal morbidity and potential neonatal mortality are associated with elective cesarean birth as compared to vaginal birth. The evidence further shows that, in order to reduce neonatal mortality, elective cesarean birth should not be performed prior to 39 completed weeks of gestation. Women desirous of large families should not undergo CDMR because of the related risks with succeeding pregnancies. Overall, the authors found that elective cesarean does not appear to confer medical benefits (Risser & King, 2010; see Table 12.2).

Maternal Benefits and Risks

No studies compare the risks and benefits of CDMR with planned vaginal birth. Because of this lack of data, researchers use proxy descriptors such as scheduled, elective cesarean birth with no indicated risk to compare outcomes of CDMR with vaginal birth (Miesnik & Reale, 2007). Findings from studies using these proxies must be used with caution because of the diverse meanings and perceptions around the descriptors.

The ACOG (2007) identified potential maternal benefits of CDMR that were reaffirmed by the organization 3 years later: decreased risk of postpartum hemorrhage and transfusion, fewer surgical complications, and a decrease in urinary incontinence the first year after birth (ACOG, 2010). These benefits may be ameliorated within 2–5 years and all benefits may be offset by advanced maternal age and high body mass index (BMI; Hannah et al., 2004; Rortveit, Daltveit, Hannestad, & Hunskaar, 2003). It has been suggested that CDMR may provide a benefit to the pelvic floor and decrease the incidence of pelvic organ prolapse (POP). However, study outcomes indicate that parity, not mode of birth, provides the greater risk for the development of POP (Richter, 2006).

The risks of fever, infection, pneumonia, and thromboembolic events are increased with a cesarean birth (Miesnik & Reale, 2007). Although there are

TABLE 12.2

Findings From the Medicaid Evidence-Based Decisions Project: Elective Cesarean Births

Finding	Strength of Evidence
No evidence of difference between cesarean birth and vaginal birth on maternal mortality	Moderate
Infection rates lower with planned cesarean than unplanned and highest for emergency cesarean	Weak
Lower rate of anesthetic-related complications with planned vaginal birth versus planned cesarean	Weak
Lower risk of hemorrhage/blood transfusion with planned cesarean than vaginal birth	Moderate
No difference in risk of hysterectomy with planned cesarean or vaginal birth	Moderate
No consistent evidence on the risk of thromboembolism	Weak
Lower risk of surgical complications with planned cesarean	Weak
Higher risk of neonatal respiratory morbidity with cesarean	Moderate
Higher risk for neonatal asphyxia or encephalopathy with operative births	Weak
Higher risk for intracranial hemorrhage for forceps and/or vacuum	Weak
Lower risk for brachial plexus injury with cesarean	Weak
Higher risk for longer length of stay for neonate with cesarean birth	Weak
Long-term outcomes	No evidence
Unexpected prematurity risk	No evidence

Note. Adapted from *Medical evidence-based decisions project: Rapid review of elective cesarean section*, by A. Risser and V. King, 2010, Portland, OR: Oregon Health & Science University.

surgical risks of potential damage to the bladder, ureters, and other abdominal structures related to cesarean birth, these risks are less when compared to vaginal birth, although the evidence for this finding is weak. There is increased risk of placenta previa or accreta in subsequent pregnancies among women who undergo cesarean birth. If there is scarring from a cesarean birth and it results in abnormal placentation in a succeeding pregnancy, future reproductive capability may be compromised (Miesnik & Reale, 2007).

Neonatal Benefits and Risks

Planned cesarean birth can have some benefits for neonates, for example, a lower mortality rate, lower infection rate, and reduced risk of intracranial hemorrhage, neonatal asphyxia, and encephalopathy. Fewer birth injuries occur to the neonate born via cesarean birth. Further, neonatal mortality may be reduced with CDMR at 40 weeks of gestation because a vaginal birth between 40 and 42 weeks' gestation can increase the risk of stillbirth (ACOG, 2007).

Respiratory distress syndrome (RDS) is a significant risk for preterm infants. A study (n = 1284 cesarean births) focused on neonatal outcomes in elective cesarean births following uncomplicated pregnancies over a 3-year period. This

study concluded that RDS could be significantly reduced if elective cesarean births occurred at 39 +0/7 weeks of gestation. The incidence of RDS after elective cesarean term birth was 22/1,000 births as compared to vaginal births (9/1,000 births). There was, however, a significant reduction in the incidence of RDS from week 37 +0/7 to 37 +6/7 weeks' gestation and thereafter falling to 5.9/1,000 births for infants born at or after 40 +0/7 weeks (Zanardo et al., 2004).

Although the establishment of fetal lung maturity may be of value in decision making related to elective birth, the late preterm infant (despite documentation of mature lecithin/sphingomyelin ratios or the presence of phosphatidyl glycerol indicating mature fetal lung status) may still develop RDS, intraventricular hemorrhage, or necrotizing enterocolitis. The ACOG (2008) takes the position that if birth is medically indicated, testing for fetal lung maturity is contraindicated and that mature fetal lung status prior to 39 completed weeks gestation is not an indication for birth (ACOG, 2008).

A study comparing adverse outcomes of infants born preterm (32–33 6/7 weeks gestation), late preterm (34–36 6/7 weeks), and term (37 weeks or later) revealed that late preterm infants had significantly increased risk of poor outcomes when compared to term infants. Perinatal and morbidity rates increased for every week less than 39 weeks' gestation (Bastek et al., 2008). These findings support ACOG's 2009 recommendation that elective induction/cesarean birth should not occur prior to 39 completed weeks of gestation (ACOG, 2009).

A large retrospective study comparing the outcomes of neonates born following documentation of fetal lung maturity prior to 39 completed weeks of gestation (n = 459) with those born at 39 or 40 weeks' gestation (n = 13,339) demonstrated that neonates born between 36 and 38 weeks, even after documented fetal lung maturity, are at a higher risk of adverse outcomes including RDS (Bates et al., 2010). There is significant risk of morbidity and mortality for neonates born prior to 39 completed weeks of gestation. CDMR should not occur prior to 39 completed weeks of gestation, regardless of fetal lung maturity. Efforts need to be directed at decreasing the rate of late preterm birth (Fuchs & Wapner, 2006).

Cesarean birth can negatively impact breastfeeding and bonding postpartum because of the recovery time and pain associated with the surgery. Breastfeeding and bonding may be negatively impacted if the infant is in the NICU. Women requesting CDMR need to be counseled that the surgery itself, even if the outcome is good, may impact immediate mother–infant bonding and feeding. There is a potential for newborns born by cesarean to spend more time separated from their mothers (Miesnik & Reale, 2007).

THE PUBLIC HEALTH IMPACT OF EIOL AND CDMR

Many women believe that cesarean birth is safer than a vaginal birth (Weaver, Statham, & Richards, 2007). However, the request for cesarean birth remains low and there is little to no distinction made between elective cesarean birth and CDMR. The former is often recommended or suggested by the physician and may be for reasons unrelated to medical indications, such as provider convenience (Wilson, 2007).

Population-Based Effects

There are public health, population-based impacts with increased cesarean birth. Plante (2006) identifies that for every 5% increase in elective cesarean birth, the United States can expect to see changes in larger population-based outcomes (see Exhibit 12.1).

Plante's (2006) assessment underscores that "what makes sense on an individual patient level may be ill-advised on a population basis and patient request is a poor substitute for policy" (p. 813).

Financial Impact

The impact of costs related to EIOL and CDMR must be considered. It is well documented that increasing the number of EIOL and CDMR increases costs to society. A recent study comparing three approaches to reduce the number of elective births found that a hard stop approach (a hospital-developed policy that would prohibit purely elective cesarean births prior to 39 weeks of gestation) had the potential to lower late preterm birth rate to 1.7% (Clark et al., 2010). This finding means that one-half million NICU days could be avoided, saving close to $1 billion annually (Clark et al., 2010).

Zupancic (2008) examined the economic implications of an increase in elective cesarean births. He emphasizes that the most important economic issue with CDMR is whether there is benefit that accrues to the mother, to the baby, or to the society. In other words, is it cost effective or does the health benefit derived offset the cost? There are few well-constructed studies that present evidence of a cost-benefit determination. As the number of EIOL and CDMR continue to increase, it will be necessary to expand nurse staffing to meet safe staffing guidelines accompanied by increased maternity care costs. These factors need to be considered as cost is passed on to insurers and to citizens through taxation (Simpson, 2010).

EXHIBIT 12.1

Population-based impacts of increased cesarean births.

14–32 more maternal deaths
5000–24,000 more surgical complications
4000–6000 more postoperative infections
2200 more postpartum readmissions to the hospital
200–300 additional cases of venous thrombosis
33,000 more neonatal intensive care admissions
8000 more cases of neonatal RDS
930,000 more hospital days (for women)
$750 million to $1.7 billion in health care expenditures
Higher rates of hospital occupancy
Longer waiting times for elective operations of all kinds
Increase in medical error with higher hospital occupancy rates

Note. RDS = respiratory distress syndrome.

Adapted from "Public health implications of cesarean on demand," by L. A. Plante, 2006, *Obstetrics & Gynecological Survey*, *61*(12), p. 813.

Impact on Health Outcomes

Once intervention occurs, a cascade of events occurs. Women need to be counseled that EIOL is an intervention in a normal process and will be accompanied by multiple further interventions such as intravenous lines, continuous electronic fetal monitoring, confinement to bed, use of high-alert medication such as oxytocin, and potential for increased pain and iatrogenic infections (Simpson, 2010).

Hewer et al. (2009) posit that elective cesarean birth is a socially constructed technological process. The transformation of cesarean birth from emergent to elective impacts health outcomes as it essentially reconstructs the way women view birth. It gives credence to birth as fraught with risk, a disease to be cured. The conversation around cesarean birth has shifted from safety to one of women's choice, particularly interesting when considering the biomedical context in which women have very few choices but now are given choices about labor induction and surgical birth. Because obstetricians usually are the health care providers who perform cesarean births, they hold the power that can marginalize the voices of the women as well as the nurse-midwives and nurses who care for them during labor (Hewer et al., 2009). CDMR may, in fact, increase a woman's fears about birth and create more anxiety: She is now burdened with refusing versus choosing. Pregnant women as well as nurse-midwives and nurses need to be well informed and active in the debates about health outcomes of EIOL and CDMR (Hewer et al., 2009).

EVIDENCE-BASED BEST PRACTICES

Even though the research is sparse and the findings sometimes controversial, there are evidence-based best practices that can inform the practice of nurse-midwifery around these issues. These include the following:

1. EIOL and/or CDMR should not occur prior to 39 completed weeks of gestation.
2. Women need to be fully informed about the risks and benefits of EIOL and CDMR and the weak-to-moderate strength of the evidence. The risks of using a high-alert medication such as oxytocin to induce labor should be included in counseling.
3. Confirmation of fetal lung maturity is not to be used as an indication for EIOL or CDMR.
4. EIOL and CDMR carry the risk of longer hospitalization time and may impede breastfeeding and bonding due to maternal–infant separation following surgery or from neonatal complications.
5. Women desirous of having several children should not undergo CDMR.
6. Practices and care facilities should develop policies around EIOL and CDMR that are based on the best evidence, safety, and cost.
7. Pregnant women should be encouraged to take childbirth education classes in which the benefits and risks of EIOL and CDMR are fully explained and there is time for discussion and reflection.
8. Birth certificates need to identify whether labor was electively induced and whether cesarean birth was elective or requested by the mother without medical indications.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 12.1

Prenatal Education About the Risks of Intervention

Emily is a 25-year-old gravida 1 para 0. She began prenatal care during the first trimester of her pregnancy and her prenatal course was uneventful. In her last month of pregnancy, she began requesting induction of labor due to common discomforts of pregnancy and because her husband was a truck driver with only 2 vacation days left for the year.

Cervical exams at 38 and 39 weeks' gestation revealed a closed, unripe cervix. The patient was counseled about the risks of induction of labor with an unripe cervix and the increased likelihood of cesarean birth. At 40 weeks, her provider agreed to electively induce labor and Emily was admitted to labor and delivery at 40 2/7 weeks. Cervical exam revealed that the cervix was dilated 1 to 2 cm, 50% effaced, soft, and posterior. The vertex presentation was noted to be at −2 station. Bishop's score was 4. Pitocin induction of labor was initiated and continued for 9 hours. The patient achieved contractions every 2 minutes, but there was no cervical change. She was discharged home that evening with a diagnosis of "failed induction of labor."

Emily returned the following day in prodromal labor and was dilated 2 cm, 100% effaced, and −2 station. The Bishop's score was now 6. Artificial rupture of membranes was performed, after which she received epidural anesthesia, Pitocin augmentation, and progressed to 7 cm before developing uterine tachysystole. Discontinuation of the Pitocin resulted in spacing of the contractions. Attempts to restart the Pitocin resulted in uterine hyperstimulation. During one episode of tachysystole, the fetal heart rate decelerated to 80 bpm. Emily then underwent an urgent primary cesarean birth for non-reassuring fetal heart rate and failure to progress. Her baby boy weighed 6 lbs. 13 oz., with Apgar scores of 8 and 9.

Exemplar of Best Practice

This case study exemplifies the cascade of events that can occur with technological intervention. Using evidence-based information in counseling, this woman's health care provider potentially could have helped Emily to avoid the risks of elective induction of labor (EIOL), primary cesarean birth, and potential complications for Emily in future pregnancies.

As an exemplar of best practice, the nurse-midwife needs to ensure that the client and her family have the opportunity to discuss and reflect on the evidence for best practice and be aware of the risks associated with intervention in a normal process. Ongoing education during the pregnancy and encouraging participation in childbirth classes are two exemplars of best practices available to nurse-midwives that may prevent EIOL, primary cesarean birth, or maternal–infant complications in current or subsequent pregnancies.

REFERENCES

Agency for Healthcare Research and Quality. (2009). *Maternal and neonatal outcomes of elective induction of labor* (AHRQ Evidence Report/Technology Assessment No. 176). Rockville, MD: Author.

American College of Nurse-Midwives. (2005). *Elective primary Cesarean section* (Position Statement). Retrieved from http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000000062/Elective%20Primary%20CS%20Mar%2006.pdf

American College of Nurse-Midwives. (2010). *Induction of labor* (Position Statement). Retrieved from http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000000235/Induction%20of%20Labor%2010.10.pdf

American College of Obstetricians and Gynecologists. (2007). ACOG Committee Opinion No. 394: Cesarean delivery on maternal request. *Obstetrics and Gynecology*, *110*(6), 1501.

American College of Obstetricians and Gynecologists. (2008). ACOG Practice Bulletin No. 97: Fetal lung maturity. *Obstetrics and Gynecology*, *112*(3), 717–726.

American College of Obstetricians and Gynecologists. (2009). ACOG Practice Bulletin No. 107: Induction of labor. *Obstetrics and Gynecology*, *114*(Pt. 1), 386–397.

American College of Obstetricians and Gynecologists. (2010). *Cesarean delivery on maternal request* (Reaffirmation). Retrieved from http://www.acog.org/Resources_And_Publications/Committee_Opinions/Committee_on_Obstetric_Practice/Cesarean_Delivery_on_Maternal_Request.aspx

Balit, J. L., & Ohio Perinatal Quality Collaborative. (2010). Rates of labor induction without medical indication are overestimated when derived from birth certificate data. *American Journal of Obstetrics and Gynecology*, *203*(3), 269.e1–269.e3.

Bastek, J. A., Sammel, M. D., Paré, E., Srinivas, S. K., Posencheg, M. A., & Elovitz, M. A. (2008). Adverse neonatal outcomes: Examining the risks between preterm, late preterm, and term infants. *American Journal of Obstetrics and Gynecology*, *199*(4), 367.e1–367.e8.

Bates, E., Rouse, D. J., Mann, M. L., Chapman, V., Carlo, W. A., & Tita, A. T. (2010). Neonatal outcomes after demonstrated fetal lung maturity before 39 weeks gestation. *Obstetrics and Gynecology*, *116*(6), 1288–1295.

Beebe, L., Beaty, C., & Rayburn, W. (2007). Immediate neonatal outcomes after elective induction of labor. *Journal of Reproductive Medicine*, *52*(3), 173–175.

Berghella, V., Blackwell, S. C., Ramin, S. M., Sibai, B. M., & Saade, G. R. (2011). Use and misuse of the term "elective" in obstetrics. *Obstetrics and Gynecology*, *117*(Pt.1), 372–376.

Caughey, A. B., Sundaram, V., Kaimal, A. J., Cheng, Y. W., Gienger, A., Little, S. E., . . . Bravata, D. M. (2009). *Maternal and neonatal outcomes of elective induction of labor* (AHRQ Publication No. 09-E005). Rockville, MD: Agency for Healthcare Research and Quality.

Caughey, A. B., Sundaram, V., Kaimal, A. J., Gienger, A., Cheng, Y. W., McDonald, K. M. . . . Bravata, D. M. (2009). Systematic review: Elective induction of labor versus expectant management of pregnancy. *Annals of Internal Medicine*, *151*(4), 252–263.

Centers for Disease Control and Prevention/National Center for Health Statistics. (2008). *FastStats: Births—Method of delivery* (National Vital Statistics Reports). Retrieved from http://www.cdc.gov/nchs/fastats/delivery.htm

Christilaw, J. E. (2006). Cesarean section by choice: Constructing a reproductive framework for the debate. *International Journal of Gynaecology and Obstetrics*, *94*(3), 262–268.

Clark, S. L., Frye, D. R., Meyers, J. A., Belfort, M. A., Dildy, G. A., Kofford, S., . . . Perlin, J. A. (2010). Reduction in elective delivery at <39 weeks of gestation: Comparative change and the impact on neonatal intensive care admission and stillbirth. *American Journal of Obstetrics and Gynecology*, *203*(5), 449.e1–449.e6.

Clark, S. L., Simpson, K. R., Knox, G. E., & Garite, T. J. (2009). Oxytocin: New perspectives on an old drug. *American Journal of Obstetrics and Gynecology*, *200*(1), 35.e1–35.e6.

Ehrenthal, D. B., Jiang, X., & Strobino, D. M. (2010). Labor induction and the risk of cesarean delivery among nulliparous women at term. *Obstetrics and Gynecology*, *116*(1), 35–42.

Fuchs, K., & Wapner, R. (2006). Elective cesarean section and induction and their impact on late preterm births. *Clinics in Perinatology*, *33*(4), 793–801.

Hannah, M. E., Whyte, H., Hannah, W. J., Hewson, S., Amankwah, K., Cheng, M., . . . Willan, A. (2004). Maternal outcomes at 2 years after planned cesarean section versus planned vaginal birth for breech presentation at term: The international randomized Term Breech Trial. *American Journal of Obstetrics and Gynecology*, *191*(3), 917–927.

Hewer, N., Boschma, G., & Hall, W. A. (2009). Elective caesarean section as a transformative technological process: Players, power and context. *Journal of Advanced Nursing*, *65*(8), 1762–1771.

Kaimal, A. J., Little, S. E., Odibo, A. O., Stamilio, D. M., Grobman, W. A., Long, E. F. . . . Caughey, A. B. (2011). Cost-effectiveness of elective induction of labor at 41 weeks in nulliparous women. *American Journal of Obstetrics & Gynecology*, *204*(2), 137.e1–137.e9.

Keirse, M. J. (2010). Elective induction, selective deduction, and cesarean section. *Birth*, *37*(3), 252–256.

King, V. J., Pilliod, B. S., & Little, A. (2010). *Rapid review: Elective induction of labor*. Retrieved from Oregon Health & Science University, Medicaid Evidence-Based Decisions Project (MED) website: http://www.ohsu.edu/xd/research/centers-institutes/evidence-based-policy-center/med/upload/Elective-Induction-of-Labor_PUBLIC_Rapid-Review_Final_12_10.pdf

Lydon-Rochelle, M. T., Cárdenas, V., Nelson, J. C., Holt, V. L., Gardella, C., & Easterling, T. R. (2007). Induction of labor in the absence of standard medical indications: Incidence and correlates. *Medical Care*, *45*(6), 505–512.

March of Dimes. (2008). *Pregnancy and newborn health education center: Inducing labor*. Retrieved from http://www.marchofdimes.com/pnhec/240_20202.asp

Martin, J. A., Hamilton, B. E., Sutton, P. D., Ventura, S. J., Menacker, F., Kirmeyer, S., & Matthews, T. J. (2009). Births: Final data for 2006. *National Vital Statistics Report*, *57*(7), 1–102.

Maslow, A. S., & Sweeny, A. L. (2000). Elective induction of labor as a risk factor for cesarean delivery among low-risk women at term. *Obstetrics and Gynecology*, *95*(Pt. 1), 917–922.

Menacker, F., & Hamilton, B. E. (2010). Recent trends in cesarean delivery in the United States (NCHS Data Brief No. 35). Hyattsville, MD: Centers for Disease Control and Prevention/National Center for Health Statistics.

Miesnik, S. R., & Reale, B. J. (2007). A review of the issues surrounding medically elective cesarean delivery. *Journal of Obstetric and Neonatal Nursing*, *36*(6), 605–615.

National Institutes of Health. (2006). NIH state-of-the-science conference statement on cesarean delivery on maternal request. *NIH Consensus and State-of-the-Science Statements*, *23*(1), 1–29.

Plante, L. A. (2006). Public health implications of cesarean on demand. *Obstetrical & Gynecological Survey*, *61*(12), 807–815.

Richter, H. E. (2006). Cesarean delivery on maternal request versus planned vaginal delivery: Impact on development of pelvic organ prolapse. *Seminars in Perinatology*, *30*(5), 272–275.

Risser, A., & King, V. (2010). *Rapid review: Elective cesarean section*. Retrieved from Oregon Health & Science University, Medicaid Evidence-Based Decisions Project (MED) website: http://www.ohsu.edu/xd/research/centers-institutes/evidence-based-policy-center/med/upload/Elective-Delivery-Elective-Cesarean_PUBLIC_Rapid-Review_Final_12_1_10.pdf

Rortveit, G., Daltveit, A. K., Hannestad, Y. S., & Hunskaar, S. (2003). Urinary incontinence after vaginal delivery or cesarean section (Norwegian EPINCONT Study). *New England Journal of Medicine*, *348*(10), 900–907.

Simpson, K. R. (2010). Reconsideration of the costs of convenience: Quality, operational, and fiscal strategies to minimize elective labor induction. *Journal of Perinatal & Neonatal Nursing*, *24*(1), 43–52.

Simpson, K. R., & Atterbury, J. (2003). Trends and issues in labor induction in the United States: Implications for clinical practice. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *32*(6), 767–779.

Simpson, K. R., & Knox, G. E. (2009). Oxytocin as a high-alert medication: Implications for perinatal safety. *MCN. The American Journal of Maternal Child Nursing*, *34*(1), 8–15.

Simpson, K. R., Newman, G., & Chirino, O. R. (2010a). Patient education to reduce elective labor inductions. *MCN. The American Journal of Maternal Child Nursing*, *35*(4), 189–194.

Simpson, K. R., Newman, G., & Chirino, O. R. (2010b). Patients' perspectives on the role of prepared childbirth education in decision making regarding elective labor induction. *Journal of Perinatal Education*, *19*(3), 21–32. doi:10.1642/10581240X514396

Tita, A. T., Landon, M. B., Spong, C. Y., Lai, Y., Leveno, K. J., Varner, M. W. . . . Mercer, B. M. (2009). Timing of elective repeat cesarean delivery at term and neonatal outcomes. *New England Journal of Medicine*, *360*(2), 111–120.

Vardo, J. H., Thornburg, L. L., & Glantz, J. C. (2011). Maternal and neonatal morbidity among nulliparous women undergoing elective induction of labor. *Journal of Reproductive Medicine*, *56*(1–2), 25–30.

Weaver, J. J., Statham, H., & Richards, M. (2007). Are there "unnecessary" cesarean sections? Perceptions of women and obstetricians about cesarean sections for nonclinical indications. *Birth*, *34*(1), 32–41.

Wilson, B. L. (2007). Assessing the effects of age, gestation, socioeconomic status, and ethnicity on labor inductions. *Journal of Nursing Scholarship*, *39*(3), 208–213.

Zanardo, V., Simbi, A. K., Franzoi, M., Soldà, G., Salvadori, A., & Trevisanuto, D. (2004). Neonatal respiratory morbidity risk and mode of delivery at term: Influence of timing of elective caesarean delivery. *Acta Paediatrica*, *93*(5), 643–647.

Zupancic, J. A. (2008). The economics of elective cesarean section. *Clinics in Perinatology*, *35*(3), 591–599.

Vaginal Birth After Cesarean: Emotion and Reason

13

Mayri Sagady Leslie

THE DILEMMA OF VBAC

Nurse-midwives face many issues when caring for mothers eligible for vaginal birth after cesarean (VBAC). The mother's choice between VBAC and elective repeat cesarean delivery (ERCD) and the nurse-midwife's care are influenced by the values and preferences. These values and preferences include the woman's current health, history, and sociocultural environment; current best evidence and professional guidelines; institutional policies influencing the practice environment; and the overarching political-cultural environment.

VBAC is not a neutral issue. The term *trial of labor* (TOL; also called trial of labor after cesarean [TOLAC]) suggests that a VBAC labor is only a "trial." Because any woman in labor has the potential of having a cesarean, the term *trial* could be applied to all labors. A large review of the VBAC literature in the United States found that the VBAC success rate (the number of women who had a TOL followed by a VBAC) is 74% (Guise, Denman et al., 2010). This contrasts with the 67.1% in 2009 vaginal birth rate in the United States (Hamilton, Martin, & Ventura, 2010). This chapter will explore the history of VBAC in the United States, some of the key questions and perspectives surrounding the practice, existing evidence for safety, and best practices for nurse-midwives in expanding choice for VBAC.

The History of the VBAC Dilemma

From a rate of 3% in the United States in 1981 (Placek & Taffel, 1988), the VBAC rate rose to 28.3% in 1996 (Ventura, Martin, Curtin, & Mathews, 1998) and then dropped to 8.5% in 2006, representing a 70% decline (Martin et al., 2009). In 1980, the National Institutes of Health (NIH) held the Consensus Conference on Cesarean Childbirth in response to the tripling of the U.S. cesarean rate from 5% to 15.2% (Placek & Taffel, 1988). A result of the conference was recommendation of VBAC as one solution for reducing the rising cesarean rate (Placek &

Taffel, 1988). In response to the NIH consensus statement, the American College of Obstetricians and Gynecologists (ACOG) released a series of guidelines in 1982, 1984, 1994, and 1995, recommending less restriction of the practice (Gregory, Fridman, & Korst, 2010). The practice of VBAC expanded with support from policy makers and third-party payers (Gregory et al., 2010). Some managed care organizations and third-party payers even mandated that women must attempt VBAC (ACOG, 1999).

At the peak of VBAC practice, a paper was published describing potential adverse outcomes of VBAC. This paper reversed the growing VBAC trend (McMahon, Luther, Bowes, & Olshan, 1996). Some experts point out that the conclusions presented were not necessarily new information, but that the timing and visibility of the paper created a major impact (Gregory et al., 2010). The publicity around this study and subsequent publications raised issues of safety and resulted in decreased support for VBAC from policy makers, insurers, malpractice companies, and the public.

In 1999, the ACOG released a revised, more conservative patient safety bulletin on VBAC. It stated, "VBAC should be attempted in institutions equipped to respond to emergencies with physicians immediately available to provide emergency care" (p. 201). In addition, it stated that anesthesia and personnel for an emergency cesarean birth should be available. The recommendations for the "immediately available physician standard" was given a Level C rating (consensus and expert opinion), whereas the recommendation that women be counseled about VBAC as an option and offered a TOL was rated as a Level A recommendation (based on scientific evidence; ACOG, 1999). However, the immediately available physician standard was the message heard, changing the practice climate. This climate of concern for safety was the result from the McMahon et al. (1996) and the revised ACOG (1999) statement. It led to rising concerns among providers about malpractice liability and resulted in many providers refusing to offer VBAC.

In 2001, another landmark paper affecting the VBAC climate was published by Lydon-Rochelle, Holt, Easterling, and Martin. The researchers presented new data on safety, citing the elevated risk of uterine rupture with VBAC as compared to ERCD. A national survey of midwifery practices, published in 2002, reported that nurse-midwives were experiencing restrictions in practice. Among the respondents, 68% cited the 1999 ACOG statement and 29% cited other recent studies as the source of the restrictions (Carr, Burkhardt, & Avery, 2002).

Based on the ACOG (1999) immediately available physician standard recommendation, hospitals reacted around the need for increased staffing and escalating costs. This recommendation particularly affected small community and rural hospitals with limited number of births per year (Roberts, Deutchman, King, Fryer, & Miyoshi, 2007; Zweifler et al., 2006). The impact was significant, as 39% of U.S. hospitals have fewer than 500 births per year (American Hospital Association [AHA], 2008, 2009). The concern for malpractice liability, safety, and the immediately available physician standard (ACOG, 1999) stopped many providers and hospitals from practicing VBAC. However, there are hospitals that met the standard, which still did not permit VBAC even when providers wanted to provide this service (Perl, 2010).

The "VBAC ban" is currently in effect in approximately 30% of all U.S. hospitals (International Cesarean Awareness Network [ICAN], 2011b). There is an ICAN website (http://ican-online.org/vbac-ban-info) that identifies U.S. hospitals with the VBAC ban.

In a study published in 2010, 774 obstetrician-gynecologists (48% of the study population) reported they were no longer offering VBAC. Concern for adverse outcomes and liability were the primary reasons cited for this practice change (Wells, 2010). A national survey of women who gave birth in U.S. hospitals in the year 2005 showed that 57% of those who desired a VBAC were denied the option. Caregiver unwillingness accounted for 45% of the denials followed by hospital policy (23%). Medical reason other than a prior cesarean birth accounted for 20% of the denials for a VBAC (Declercq, Sakala, Corry, & Applebaum, 2007).

The Current Climate Around VBAC

In March 2010, the *NIH Consensus Development Conference Statement: Vaginal Birth After Cesarean: New Insights* took place. A 15-member panel presided over presentations from experts and the public (NIH, 2010). It also presented evidence from the Agency for Healthcare Research and Quality's (AHRQ) report, *Vaginal Birth After Cesarean: New Insights* (Guise, Eden et al., 2010). The NIH (2010) made five recommendations:

1. "Given the available evidence, trial of labor is a reasonable option for many pregnant women with one prior low transverse uterine incision" (p. 2).
2. As to risk and benefits, the report stated,

   > The data reviewed in this report show that both a trial of labor and elective repeat cesarean delivery for a pregnant woman with one prior transverse uterine incision have important risks and benefits. Because the risks and benefits differ for the woman and her fetus, there is a profound ethical dilemma for the woman, as well as her caregivers, as benefit for the woman may come at the price of increased risk for the fetus and vice versa. (p. 2)

   The panel pointed out that this dilemma is complicated by the lack of high-level evidence supporting the data.
3. "When trial of labor and elective repeat cesarean delivery are medically equivalent options, a shared decision-making process should be adopted and, whenever possible, the woman's preference should be honored" (p. 2).
4. "The panel recommends that hospitals, maternity care providers, healthcare and professional liability insurers, consumers, and policymakers collaborate on the development of integrated services that could mitigate or even eliminate current barriers to trial of labor" (p. 3). The panel also specifically recommended that ACOG reassess their requirement or the immediately available physician standard, given the lack of evidence for the standard.
5. "Policymakers, providers, and other stakeholders must collaborate in developing and implementing appropriate strategies to mitigate the chilling effect the medical-legal environment has on access to care" (p. 3).

See http://consensus.nih.gov/2010/vbac.htm for the *NIH Consensus Development Conference Statement: Vaginal Birth After Cesarean: New Insights* for further information.

Consumer and advocate response to the consensus statement was generally positive but also revealed some gaps. The effects of type of provider and the birth setting on VBAC outcomes were not addressed. A woman's informed right of refusal to have a cesarean was not clearly discussed nor was it identified as an important factor for future research. The desire for VBAC among women with more than one prior cesarean birth was not included (Birthing Beautiful Ideas, 2011).

In August of 2010, the ACOG released a revised practice bulletin on "Vaginal Birth After Previous Cesarean Delivery." It recommends that "most women with one previous cesarean delivery with a low-transverse incision are candidates for and should be counseled about VBAC and offered TOLAC" (p. 457). This is a Level A recommendation. The ACOG (2010) Level B (limited or inconsistent evidence) stated that a TOL is not contraindicated for women with

1. two previous low transverse cesarean deliveries,
2. one prior cesarean and twins in this pregnancy,
3. an unknown scar type (unless high clinical suspicion of classical incision), or
4. induction of labor (IOL; p. 458).

VBAC: THE EVIDENCE

Outcomes Versus Mothers' Intended Birth Route

The studies that currently populate the evidence basis for VBAC care are based on the actual births mothers had in the studies versus what they planned to have. So when the findings are being compared between mothers who had VBACs and those who had cesareans, it does not take into account mothers' intentions before labor started. The alternative to studying results as mentioned would be to examine outcomes based on women's intended birth route. For example, there are women who plan to have an ERCD, who go into labor and have vaginal births, and there are women who plan VBACs who have a cesarean.

> There is still no evidence to inform patients, clinicians, or policy-makers about the outcomes of intended route of delivery because the evidence is based largely on the actual route of delivery . . . this gap in information is critical (Guise, Eden et al., 2010, p. vi).

A substantial amount of the recent evidence on VBAC comes from *Evidence Report/Technology Assessment, Vaginal Birth After Cesarean: New Insights* prepared for the AHRQ (available at http://www.ahrq.gov/clinic/tp/vbacuptp.htm). This report served as a key evidence resource for the *NIH Consensus Development Conference Statement: Vaginal Birth After Cesarean: New Insights* (2010).

However, the 2010 ACOG bulletin recommended that misoprostol should not be used for cervical ripening or labor induction (Level A recommendation). The ACOG cited as evidence the findings of Guise, Denman et al. (2010) including that IOL is associated with lower success of VBAC after TOL (63% vs. 74% overall) and an increased risk for uterine rupture (ACOG, 2010). The ACOG (2010) continued to promote the immediately available physician standard (Level C evidence) in spite of the NIH (2010) recommendation that ACOG reassess this position given the "low level of evidence for the standard" (p. 34).

The ACOG (2010) guidelines affirmed patient autonomy in accepting risk and recommended that "after counseling, the ultimate decision to undergo TOLAC or a repeat Cesarean delivery should be made by the patient in consultation with her health care provider" (p. 458). In 2010, the NIH conference statement, the revised ACOG guidelines, and multiple journal articles have brought new perspectives on the VBAC dilemma.

VBAC Rates by Setting

VBAC rates vary widely in the United States. The VBAC rate (number of VBACs out of all births) ranges from 2.5% to 20.9% (Martin et al., 2009). The studies reviewed by Guise, Eden et al. (2010) showed VBAC success rates (number of VBACs out of all VBAC TOLs) ranging from 49% to 87%. A number of factors may be responsible for these wide variations in rates. The impact of professional guidelines on reducing the VBAC rate has been documented (Roberts et al., 2007; Zweifler et al., 2006). The impact of facilities banning VBAC may account for some variation. There are dramatic differences in rates among states, communities, and practices suggesting that the setting and the provider have a strong impact on the VBAC rate. These variables have all been understudied.

Hospital Studies

In 2007, DeFranco et al. conducted a retrospective cohort study of 25,065 mothers eligible for VBAC in 17 U.S. hospitals (six universities, 11 communities). The number of women having their labors induced was similar in both settings. The university hospital sample ($n = 6$) had patients with statistically significant higher numbers of risk factors, such as hypertension, preeclampsia, and preterm labor. More women chose a VBAC TOL in the university settings (61% versus 50.3%), but the VBAC success rate was similar between settings (75.9% in university hospitals and 75.1% in community hospitals). However, there was a statistically significant difference in the rate of uterine rupture (1.2% in the community hospitals versus 0.6% in the university hospitals) in spite of having higher numbers of patients with risk factors. The study did not address whether the woman had a prior vaginal birth or the number of prior cesarean births. Hence, stratification of lower risk versus higher risk candidates for VBAC limited the conclusions of the study about suitability for VBAC TOL by type of hospital setting (DeFranco et al., 2007).

A Canadian study (Wen et al., 2004) investigated the impact of hospital size on VBAC outcome. Lower volume maternity units (<500 births per year) were associated with both a higher risk of VBAC uterine rupture (OR, 4.02; 95% CI, 2.04–2.09) and maternal mortality following ERCD (OR, 2.68; 95% CI, 0.16–45.5) compared to larger volume maternity units (Wen et al., 2004).

Birth Center Studies

The safety of VBAC in birth centers was investigated by Lieberman, Ernst, Rooks, Stapleton, and Flamm in 2004. This prospective study included 1453 women planning VBAC TOLs who presented in labor at U.S. birth centers between 1990 and 2000. Key findings included an average VBAC success rate of 87%, with a uterine rupture rate of 0.4% and a fetal/neonatal mortality rate of 0.5%. However, half of the uterine ruptures and 57% of the perinatal deaths occurred among mothers who had more than one previous cesarean or who were 42 weeks or greater in gestational age.

The findings of the Lieberman et al. (2004) study were compared to outcomes of VBAC labors in comparable (or even higher risk) populations in U.S. hospitals. The perinatal death rate in the birth center population exceeded hospital rates in all comparable studies. The authors recommended that VBAC should take place within the hospital setting, not in birth centers (Lieberman et al., 2004). In a commentary, Albers (2005) suggested that healthy women who are not postdates in gestational age and with a history of only one previous cesarean birth might still be a candidate for birth center care.

Home Birth Studies

Latendresse, Murphy, and Fullerton (2005) reported on VBAC in the home birth setting. Twenty-nine home birth midwifery practices contributed data to the study, and the results of 57 VBAC TOLs were evaluated. The VBAC success rate was 94.7%, with 87.7% of the VBACs occurring in the home. There was no incidence of uterine rupture or scar dehiscence. One infant was stillborn, a postdate infant with meconium present. The study size was not sufficient to make statistical inferences about maternal or neonatal mortality (Latendresse et al., 2005).

Influence of the Provider on VBAC

Unless restricted by an institution, the health care provider has significant influence on the option and climate of support for a VBAC TOL and the management pathways if complications arise.

Midwife-Attended Births

Within the past 20 years, there are two U.S. studies on VBAC care by nurse-midwives. Harrington, Miller, McClain, and Paul (1997) conducted a cohort study

in a hospital-based birth center. The study compared women planning VBAC ($n = 302$) with a control group of women planning vaginal birth with no history of cesarean birth ($n = 298$). The VBAC success rate was 98.3%, and the vaginal birth rate for the control group was 99.3%. There was no statistically significant difference between the two groups ($p = .45$) and there was no difference in maternal or neonatal morbidity. Among the intervention group, 84% had previously had a successful VBAC, thus limiting generalizability of the study (Harrington et al., 1997).

A study by Avery, Carr, and Burkhardt (2004) reported on the results of 649 VBACs in eight nurse-midwifery practices. The overall VBAC success rate was 72%. In contrast to the Harrington et al. (1997) study, 84% (415/495) of the women did *not* have a prior VBAC (Avery et al., 2004).

Physician-Attended Births

A 2003 survey of ACOG members found that among 73% of the respondents, less than half of their patients with previous cesareans had VBAC TOLs. Male providers were more likely to perform repeat cesareans than their female counterparts ($p = .005$). Among the survey participants, 58% self-reported a VBAC success rate of 50%–80% (Coleman, Erickson, Schulkin, Zinberg, & Sachs, 2005).

In 2008, Russillo, Sewitch, Cardinal, and Brassard reported on differences in VBAC care between obstetricians and family physicians. They reviewed the records of 3694 births between 1995 and 2003 and found that family physicians had a higher rate of TOL than obstetricians (81.1% vs. 50.6%; $p < .0001$). The VBAC success rate was also higher for family physicians (76.1%) compared to the obstetricians (64.3%; $p = .002$). Uterine rupture and dehiscence were measured as a combined outcome. There was no statistical significance between groups ($p = .33$). Baseline characteristics and other outcomes were similar for both groups (Russillo et al., 2008).

COMPARISON OF OUTCOMES BETWEEN VBAC AND ERCD

The most common way to consider the evidence on VBAC is to compare the outcomes between VBACs and ERCD. However, this may result in some skewing of the data. Frequently, studies forming the evidence basis on VBAC and uterine rupture do not include the variable of IOL. Guise, Eden et al. (2010) state that IOL more than triples the risk of uterine rupture with VBAC. This fact is a key variable in examining uterine rupture data.

Maternal Outcomes

Maternal outcomes (see Table 13.1) are described by Guise, Eden et al. (2010). When available, information has been displayed with data for both all gestational ages and for term pregnancies only. Because the majority of midwifery clients are term pregnancies, these outcomes may be more relevant than the overall statistics often provided. Data are provided as percentage per 100,000 births.

TABLE 13.1

Outcomes of Vaginal Birth After Cesarean Compared With Elective Repeat Cesarean Delivery

Outcome	Women With VBAC	%	Women With ERCD	%
Maternal Mortality				
All gestational ages	3.8/100,000	0.0038	13.4/100,000	0.0134
Term births only	1.9/100,000	0.0019	9.6/100,000	0.0094
Uterine Rupture				
All gestational ages	325/100,000	0.325	26/100,000	0.026
Term births only	778/100,000	0.775	22/100,000	0.022
Uterine Rupture and IOL				
With IOL at any gestational age	1000/100,000	1.0		
With IOL at term	1500/100,000	1.5		
With IOL >40 weeks	3200/100,000	3.2		
Hysterectomy				
All gestational ages	170/100,000	0.17	280/100,000	0.28
Term	140/100,000[a]	0.14	160/100,000[a]	0.16
Perinatal Mortality[b]				
Perinatal mortality[b]	130/100,000	0.13	50/100,000	0.05
Neonatal mortality[c]	110/100,000	0.11	50/100,000	0.05
After uterine rupture:				
2.8%–6.0% of those with rupture. Overall risk is:	20/100,000	0.020		

Note. VBAC = vaginal birth after cesarean; ERCD = elective repeat cesarean delivery; IOL = induction of labor.
[a]Not statistically significant. [b]>20 weeks' gestation up to 28 days of life. [c]Birth up to 28 days of life.
Adapted from *Vaginal birth after cesarean: New insights* (Evidence Report/Technology Assessment No. 191, AHRQ Publication No. 10-E003), by J. M. Guise, K. Eden, C. Emeis, M. A. Denman, N. Marshall, R. Fu, . . . M. McDonagh, 2010, Rockville, MD: Agency for Healthcare Research and Quality.

Maternal Mortality

Maternal death is a rare event for both VBAC and ERCD. However, there is a substantial difference in risk between the two groups (1.9/100,000 for VBAC versus 9.6/100,000 for ERCD at term). For all gestational ages, there will be nine fewer deaths per 100,000 women when VBAC is chosen. Guise, Eden et al. (2010) rated the strength of the evidence on maternal mortality as high.

Uterine Rupture

Uterine rupture is the most significant adverse event associated with VBAC and drives much of the debate and decision making on the topic. To be included in the review on uterine rupture (Guise, Eden et al., 2010), all studies had to define the event as a "complete separation through the entire thickness of the uterine wall

(including serosa)" (p. 51). Hence, no scar dehiscence is included in these data. It is important to note that none of the studies in this review collected data on IOL, a factor known to increase the risk of uterine rupture. The strength of the evidence on uterine rupture was rated as moderate (Guise, Eden et al., 2010).

Among women of all gestational ages, 325/100,000 women having a VBAC TOL will experience uterine rupture versus 26/100,000 women with ERCD. Among women at term, 778/100,000 having a VBAC TOL will rupture compared to 22/100,000 with ERCD. Risk increases with gestational age for women having VBAC (Guise, Eden et al., 2010b).

In an analysis of the large NIH study (n = 39,111) entitled *Maternal Health Fetal Medicine Units Network* (MFMU), Spong et al. (2007) reviewed the risk of uterine rupture. The authors report that risk increases as follows:

1. ERCD without labor (0.0/100,000 births);
2. Indicated repeat cesarean delivery (IRCD) without labor (80/100,000 births);
3. ERCD with labor (such as might happen after a unsuccessful VBAC TOL; 150/100,000 births); and
4. VBAC TOL (including vaginal or cesarean delivery; 740/100,000 births).

In the MFMU study, 98% (103/105) of the women with classical, inverted T- or J-shaped incisions did not have any adverse effects on their scars, and women who experienced rupture had increased risk for hysterectomy (14%–33%), but there was no maternal mortality (Landon et al., 2004). Perinatal mortality from uterine rupture ranged from 2.8% to 6% (Guise, Eden et al., 2010). No evidence has been found to support the following factors as influential in uterine rupture: maternal age, gestational age, or history of a preterm cesarean birth (Lydon-Rochelle, Cahill, & Spong, 2010).

IOL substantially increases the risk of uterine rupture in a woman who has chosen a VBAC TOL and the risk increases with gestational age (1500/100,000 births at term versus 3200/100,000 births >40 weeks; Guise, Eden et al., 2010). Specific methods of induction and augmentation related to uterine rupture were reviewed by Guise, Eden et al. The studies reviewed did not use a strictly anatomical definition of rupture and in some cases included dehiscence. Augmentation of labor was reviewed and was not found to be a significant factor in the incidence of uterine rupture. The strength of the evidence on induction methods and uterine rupture was considered low.

The risk of uterine rupture associated with VBAC is the primary reason for the recommendation for an immediately available physician, anesthesia, and other staff ready to respond to an emergency. Minkoff and Fridman (2010) posit that if the standard requiring an in-house physician for VBAC is valid due to the risk of uterine rupture, then it should be equally valid for mothers at risk for other events such as placental abruption, cord prolapse, and shoulder dystocia (see Table 13.2). The authors also state that there has been no evidence to date showing improved outcomes in hospitals where this standard has been applied (Minkoff & Fridman, 2010).

Rozen, Ugoni, and Sheehan (2011) proposed comparing VBAC outcomes with primiparous spontaneous and induced vaginal births as more analogous than

TABLE 13.2

Incidence of Adverse Labor Events

Event	Incidence/Births	Source
Uterine rupture w/ VBAC TOL[a]	8/1000	Guise, Eden et al., 2010b
Placental abruption	11–13/1000	Ananth and Wilcox, 2001
Cord prolapse	14–62/1000	Murphy and Mackenzie, 1995
Shoulder dystocia	6–14/1000	MacKenzie et al., 2007

Note. VBAC = vaginal birth after cesarean; TOL = trial of labor.

[a]All gestational ages.

comparing VBAC with ERCD. In a retrospective cohort study ($n = 21{,}389$ women), the authors demonstrated that neonatal morbidity, postpartum hemorrhage, and third- and fourth-degree lacerations were not a statistically significant difference between the two groups. Four events of dehiscence occurred and one event of rupture, but the study had insufficient power to be statistically significant. Four events of uterine dehiscence were found at the time of surgery among women who had tried VBAC TOL. The one true rupture was a woman undergoing induction with no previous cesarean history (Rozen et al., 2011).

Hysterectomy

The risk for hysterectomy at *term* is not different between VBAC and ERCD. When considering all gestational ages, there is a slightly higher risk with ERCD (Guise, Eden et al., 2010). Factors found to increase the risk of hysterectomy included IOL in women with no previous vaginal delivery (Grobman et al., 2007), more than two cesareans (Silver et al., 2006), and high-risk pregnancy (Gregory et al., 2008).

Transfusion

Overall, transfusion risk was not found to be significantly different between VBAC TOL and ERCD. However, studies were inconsistent with five studies reporting more transfusions with ERCD and four reporting more transfusions with VBAC (Guise, Eden et al., 2010). High-risk pregnancies (Gregory et al., 2008; Spong et al., 2007), multiple cesareans (Landon et al., 2006; Silver et al., 2006), and induction (Grobman et al., 2007) were factors associated with an increased risk for transfusion. One study found that more VBACs were associated with fewer transfusions (Mercer et al., 2008).

Obesity

Increased basal metabolic index (BMI) has been linked to decreased VBAC success rates. Women who enter labor in an obese or morbidly obese state are at highest risk for adverse outcomes such as uterine rupture or dehiscence, wound infection, and

increased hospital stay. Their babies are at risk for greater birth weight (>4000 g) and injury during the birthing process (Guise, Eden et al., 2010).

Post-Cesarean Pain

The effects of long-term pain associated with cesarean surgery has been studied and documented (Almeida, Nogueira, Candido dos Reis, & Rosa e Silva 2002; Hannah et al., 2004; Loos, Scheltinga, Mulders, & Roumen, 2008; Luijendijk et al., 1997; Nikolajsen, Sørensen, Jensen, & Kehlet, 2004). One study found that 33% of respondents had chronic pain at the incision site 2 years after their surgery with 8.9% saying the pain interfered with daily activities (Loos et al., 2008).

Fertility and Pregnancy Loss

A key reason to consider VBAC is the effect of cesarean birth on childbearing potential. Multiple studies have examined the issue of fertility after cesarean versus vaginal birth and found lower rates of fertility after cesareans among women actively trying to conceive. After controlling for multiple confounding factors, a history of cesarean was found to have a direct effect on women who took more than a year to conceive versus women with no history of cesarean (Murphy, Stirrat, & Heron, 2002).

There is limited data on the effect of cesarean on subsequent spontaneous abortion and ectopic pregnancy (Silver, 2010), but a review of cohort studies (Hemminki, 1996) and an individual cohort study (Mollison, Porter, Campbell, & Bhattacharya, 2005) showed an increase in both events after cesarean birth. One small cohort study found no difference (Tower, Strachan, & Baker, 2000). Ectopic pregnancy at the site of the cesarean scar can be a rare, life-threatening complication similar to placenta accreta. The rate of this complication is increasing with the increasing cesarean rate and is estimated to occur in approximately 1 in 2000 pregnancies (Silver, 2010).

Women with one prior cesarean have ERCD or a cesarean after an unsuccessful VBAC TOL who continue to have children up to the third pregnancy may again have the option to choose between VBAC and ERCD. "Women with two previous low transverse cesarean deliveries may be considered candidates for TOLAC" (ACOG, 2010, p. 458). If they have a third or subsequent cesarean, the health risks significantly increase. This is an important component of informed choice as 50% of all pregnancies in the United States are unplanned (Centers for Disease Control and Prevention [CDC], 2010). The most adverse outcomes with multiple cesareans are hysterectomy, placenta previa, and placenta accreta (Guise, Eden et al., 2010; Silver, 2010).

Infant Outcomes

Perinatal Mortality

The *perinatal mortality rate* (PMR) is defined by the National Center for Vital Statistics to include the deaths of infants less than 28 days of age and fetal deaths of 20 weeks or more gestation (MacDorman & Kirmeyer, 2005). This includes

antepartum stillbirth, intrapartum demise, and deaths after the birth to 28 days. The overall PMR for VBAC TOL was 130/100,000 births. For ERCD and women who had a cesarean after VBAC TOL, it was 50/100,000 births. The PMR associated with uterine rupture was 2800 to 6000 for every 100,000 ruptures, resulting in an overall risk of 20/100,000 VBACs. The strength of the evidence on PMR was low to moderate (Guise, Eden et al., 2010).

In a review of stillbirth in subsequent pregnancies after cesarean delivery, Silver (2010) reported that three of seven studies reported an association between cesarean birth and stillbirth in the following pregnancy. There are no comparisons with stillbirth after VBAC.

Infant Morbidity

Of the studies reviewed by Guise, Eden et al. (2010), six studies found no significant differences on neonatal intensive care unit (NICU) admissions between VBAC TOL and ERCD. One study did find an increase in NICU admissions in babies whose mothers had an ERCD without labor versus a successful VBAC. The strength of evidence on NICU admissions is low. In the same analysis, Apgar scores, birth trauma, and sepsis were not significantly different when comparing VBAC TOL to ERCD. For each of these, the strength of the evidence was low. Studies reviewed on neonatal respiratory events had conflicting findings and a lack of consensus. The strength of evidence was low (Guise, Eden et al., 2010). Other authors report that infants born after an ERCD have an increased risk of transient tachypnea of the newborn, persistent pulmonary hypertension, respiratory morbidity, and respiratory distress syndrome (O'Shea, Klebanoff, & Signore, 2010; Patel & Jain, 2010). Hypoxic ischemic encephalopathy (HIE) was reviewed by Guise, Eden et al. who state "while the studies consistently report higher risk for HIE for TOL compared with ERCD, it is not possible to know the true relationship due to the low strength of the overall evidence" (p. 131). O'Shea et al. estimate a risk for mortality from HIE in VBAC TOL at 220/100,000 births, and the overall risk of disability from HIE is 170/100,000 births.

Best Practices: Translating Evidence Into Practice

Best Practice: Informed Consent

In an era where both professionals and consumer advocates speak to the right of mothers to have "patient-choice cesareans," the right to choose VBAC or vaginal delivery has decreased. Leeman and Plante (2006) raise this issue of choice for vaginal delivery. Likewise, the woman's right to choose VBAC is often restricted as approximately 30% of U.S. hospitals ban VBAC. The question of best practice in an individual situation may be subsumed by the VBAC ban, representing fear of litigation by institutions and providers. If a woman cannot control what kind of birth she ultimately will have, she should at least be able to voice her desire about her birth experience. Best practice for informed consent dictates that providers, including nurse-midwives, should be able to answer questions in a balanced

manner, comparing outcomes from planned VBAC versus planned ERCD. However, this is not always the case. A woman may be coerced into choosing elective cesarean birth by overestimation of VBAC risk, an approach that violates the principle of informed consent (Kotaska, 2010).

In reality, a woman frequently has one of three options. She can

1. comply with the recommendation for ERCD, subjecting herself to the potential harms of the ERCD, including the impact on any future pregnancies;
2. seek VBAC from providers or institutions away from her local environment or uncovered by her insurance, a decision that can have financial and social implications and most certainly contributes to health disparity for low-income women; or
3. obtain VBAC "outside the system" in an out-of-hospital setting or alone, often without the full resources needed to ensure her an optimally safe birth.

All of these options deny her both full reproductive rights and full informed consent.

Provider Counseling for VBAC Decision Making

Caughey (2009) suggests the following four questions that should be addressed in an informed consent conversation about VBAC:

1. What is the chance of having a successful VBAC?
2. What is the risk of uterine rupture with VBAC?
3. What is the chance of harm or death to her baby if the uterus ruptures? and
4. What are the risks of undergoing a repeat cesarean delivery? (p. 250)

Jordan and Murphy (2009) discuss the concept of informed compliance versus informed consent, influenced by how one discusses risk. *Informed compliance* refers to biased communication regarding medical risk such that it influences decision making (Bassett, Iyer, & Kazanjian, 2000). How risk is communicated makes a considerable difference on how women perceive their options. Counseling a mother about her risk of uterine rupture using the data derived from Guise, Eden et al. (2010) would include

1. risk of uterine rupture in this pregnancy is 0.3% (absolute risk),
2. risk of uterine rupture in this pregnancy is 11.5 times higher than a woman who had no previous cesarean birth (relative risk; 0.3/0.026), or
3. VBAC creates five additional uterine ruptures for every 1000 cesarean births (attributable risk).

Each of these statements is based on the same statistical findings but could elicit a different response in a woman considering VBAC TOL versus ERCD. The success rate of VBAC itself has not changed, but the number of TOLs has changed (Grobman et al., 2011; Guise, Eden et al., 2010). Providers need to consider how they discuss the decision. Discussion of modifiable and nonmodifiable risk factors (Guise, Eden et al., 2010; NIH, 2010) can be helpful in the discussion (see Table 13.3).

TABLE 13.3

Factors Associated With Increased Likelihood of a Successful VBAC

Modifiable Factors	Nonmodifiable Factors
■ No induction or augmentation	■ Previous vaginal birth
■ Greater dilatation on admission	■ Previous vaginal birth after cesarean (VBAC)
■ Greater dilatation at rupture of membranes	■ Spontaneous labor
■ Effacement reaches 75%–90%	■ Gestational age ≤40 weeks
■ Delivering at public and urban hospitals	■ Greater maternal height
■ BMI <30	■ Infant weight <4000 g

Note. BMI = basal metabolic index.

Adapted from *Vaginal birth after cesarean: New insights* (Evidence Report/Technology Assessment No. 191, AHRQ Publication No. 10-E003), by J. M. Guise, K. Eden, C. Emeis, M. A. Denman, N. Marshall, R. Fu, . . . M. McDonagh, 2010, Rockville, MD: Agency for Healthcare Research Quality; *National Institutes of Health consensus development conference statement: Vaginal birth after cesarean: New insights*, by the National Institutes of Health, 2010, Retrieved from http://consensus.nih.gov/2010/images/vbac/vbac_statement.pdf

Screening Tools in Counseling VBAC Eligible Women

A number of tools have been developed to screen pregnant women for VBAC eligibility. Eden et al. (2010) evaluated 16 prediction models and found that all models demonstrated reasonable ability to identify mothers who would have a VBAC, but that none were effective at consistently identifying who would have an ERCD. In the same analysis, one study reviewed three scoring tools that had been successful at predicting who would have a VBAC, yet failed to predict that 50% of the mothers who were scored with unfavorable risk factors went on to have successful vaginal births (Dinsmoor & Brock, 2004). A review of VBAC scoring systems with sensitivities and specificities and positive predictive values may be found in "Appendix N: Detailed Evaluation of Screening Tools for Predicting Vaginal Birth After Cesarean" (Guise, Eden et al., 2010, p. M4). The *VBAC calculator* (http://www.bsc.gwu.edu/mfmu/vagbirth.html) is a readily available consumer-oriented online tool. Although tools such as this one may be useful, the impact of provider management decisions and the birth environment contribute significantly to the woman's ability to decide her mode of birth.

Decision Aids for VBAC Eligible Women

There are a number of effective decision aids designed to assist women in facing the choice of VBAC TOL versus ERCD (Frost, Shaw, Montgomery, & Murphy, 2009; Moffat et al., 2007; Shorten, Shorten, Keogh, West, & Morris, 2005). Frost et al. report that in this decision making, women look for "targeted information and guidance from medical personnel based on their individual circumstances" (p. 86).

In a randomized controlled trial (RCT), Shorten et al. (2005) studied the effects of using a decision aid. At 12 to 18 weeks' gestation, eligible women were given a booklet reviewing the benefits and risks of VBAC. Knowledge, decisional conflict, and birth preference were subsequently measured twice during the pregnancy. Mode of delivery was collected, and satisfaction was measured postpartum at 6 to 8 weeks. Although there was no significant change in planned mode of birth, the booklet was

effective in improving knowledge and reducing decisional conflict. The booklet by Allison Shorten is entitled, *Birth Choices: What Is Best for You . . . Vaginal or Cesarean Birth?* It is available directly from the author (allison.shorten@yale.edu) or at http://www.capersbookstore.com.au/category.asp?attID=956, Komorowski (2010) provides an excellent online VBAC resource providing the consumer with evidence-based information (see http://givingbirthwithconfidence.org/2-2/a-womans-guide-to-vbac/).

Maternal Factors Affecting VBAC TOL Decision

Among women deciding about VBAC TOL, 48% will make their decision before they are pregnant again. Among those who remain undecided, 34% to 39% will choose VBAC TOL midway through their pregnancy (Guise, Eden et al., 2010). Eden, Hashima, Osterweil, Nygren, and Guise (2004) reviewed 11 studies examining factors affecting women's preferences for modes of delivery. Ease of recovery and a desire to return home quickly to care for other children were the most commonly cited reasons for choosing VBAC. Four of the studies reported that safety of the mother and baby was a factor but not usually the prime factor (Eden et al., 2004). In a different qualitative study of mothers' perceptions on VBAC, "maternal instincts about what is best for the baby" emerged as one of the three key themes among women who either previously had a VBAC or had tried VBAC (Phillips, McGrath, & Vaughan, 2009, p. 80). The authors describe the mothers as having "a single-minded belief in the significance of a natural birth for the newborn" (p. 80). In the review by Guise, Eden et al., women's self-efficacy, involvement in decision making, and access to counseling and educational programs were all associated with an increased choice for VBAC. Education earlier in prenatal care was also associated with higher TOL rates. Women who did not receive counseling or education from providers were more likely to choose ERCD (Guise, Eden et al., 2010).

Planning VBAC or ERCD needs to be a shared decision between the provider and the woman, using unbiased, best evidence, the woman's preference, and the realities of the environment. Counseling needs to occur in a milieu of trust, values clarification, and risk-benefit where the provider listens to the preferences of the mother and is aware of his or her own preferences, values, and potential biases. As part of this shared decision-making process, decision aids may be used (Kaimal & Kuppermann, 2010). As some women change their minds throughout the process, an open, evolving decision-making process is essential.

Best Practice: The Midwifery Model of Care

Promoting Normalcy of Birth

In a qualitative study of exemplary midwives, Kennedy and Shannon (2004) identified the core processes of midwifery care. "Support of normalcy," the primary process, included

1. belief in the normalcy of birth,
2. tolerance for wide variations of "normal,"

3. belief and trust in women's strength,
4. presence—the physical act of being "with woman," and
5. teaching students to believe and trust in normal birth (pp. 556–558).

The first four processes are especially critical in the care of women who have chosen VBAC as they often face resistance and their own doubts.

Promoting Vaginal Birth

Frequently missing in the discussion on the choice between VBAC TOL and ERCD are the benefits of vaginal birth. Although the dialogue focuses on comparative risk, it often does not take into consideration the benefits of vaginal birth to both mother and baby. As a best practice, nurse-midwives need to include discussion of the emotional and physiological benefits to the woman and as the enhanced opportunity for bonding and early breastfeeding. Gut colonization of the newborn is another key point. Within 3 days of birth, babies born by vaginal birth, as compared to those born by cesarean, have better gut colonization with bacteria important to immune system development (Biasucci et al., 2010). Vaginal birth also optimizes early breastfeeding without the disturbances of cesarean birth (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003; Evans, Evans, Royal, Esterman, & James, 2003). Lack of early colonization with *Lactobacillus* as well as *Bifidobacteria* has been associated with the subsequent development of allergies (Biasucci et al., 2010).

A Birth Plan for VBAC

Another best practice for the nurse-midwife is making a shared birth plan with the mother who has chosen VBAC TOL. A noninterventive approach promoting normalcy in labor includes

1. encouraging healthy pregnancy behaviors especially exercise and good nutrition;
2. avoiding induction especially post gestational due date;
3. if induction occurs, not using misoprostol;
4. avoiding augmentation with oxytocin;
5. avoiding artificial rupture of the membranes or waiting until transition or second stage of labor; and
6. encouraging early labor at home.

The care of VBAC women in labor, as with all women in labor, should aim for the least intervention.

Critical Functions in Nurse-Midwifery Care

Best practice for woman who has chosen VBAC includes decision support, emotional support, and midwifery clinical care. These are overlapping in function, embracing the midwifery model of care. *Decision support* involves providing information, respecting, nurturing and promoting the mother's autonomy, and recognizing one's

own preferences and biases. Decision support may be an evolving process during pregnancy as the mother considers her options. *Emotional support* is the second critical function a nurse-midwife provides. Many women with previous cesarean births have emotional issues lingering into their next pregnancy. At the heart of this support is empowerment and trust—in birth, in her body, in her own power, and in the nurse-midwife. Midwifery clinical care embraces normalcy in pregnancy, labor, birth, and postpartum. Best practice for the nurse-midwife involves using the best evidence around these three critical functions to inform practice.

Best Practice: Advocacy for VBAC

Cost-Effectiveness of VBAC

Childbirth is the number one reason for both hospitalization and medical office visits in the United States. Although cesarean births represent one third of all births, they account for nearly half of the childbirth-related expenses of hospitalization, $7.8 billion annually. Repeat cesarean birth is the number one indicator for cesareans and accounts for one third of all procedures (AHRQ, 2010). VBAC is a cost-effective option to escalating cesarean rates and escalating health care costs. Increasing the number of VBACs would reduce the number of ERCDs. A review of 12 papers on this topic was conducted by Guise et al. (2003). The authors reported that at 76% success or greater, VBAC is more cost effective than ERCD and offers a higher quality of life to mothers in the years beyond the birth (Guise et al., 2003). This is a critical point for the nurse-midwife to use in advocating with administrators in health care systems.

Consumer Participation in Advocacy for VBAC

Consumers have considerable impact on health care policy decisions (Romano, Gerber, & Andrews, 2010). For instance, the ICAN has a volunteer workforce and a public website for the general public on reporting access to VBAC in U.S. hospitals (see http://ican-online.org/vbac-ban-info). The Coalition for Improving Maternity Services is another example of consumer action. Mothers share their experiences of providers and hospitals in a site entitled "The Birth Survey" (see http://thebirthsurvey.org/). In addition to direct advocacy efforts, a best practice for the nurse-midwife is supporting patients and the general public in consumer-driven advocacy.

Key Advocacy Strategies

Encouraging open discussion and speaking to key talking points in VBAC advocacy help to shape the discourse. The nurse-midwife, as an expert in birth, has a respected voice and can contribute toward effecting change. Examples of strategic ideas and talking points for changing the VBAC environment include the following:

1. The more VBAC TOLs, the more VBACs (when VBAC rates fall, it is the TOL rate, not the success rate).

2. The more primary VBACs, the more subsequent VBACs (who have an even greater chance for VBAC success and fewer uterine ruptures).
3. Identifying levels of risk assessment for VBAC TOL (low, medium, high) can decrease the need for the immediately available physician standard, making VBAC more accessible to low-risk VBAC women (see Northern New England Perinatal Quality Improvement Network VBAC Project at http://www.nnepqin.org/site/page/vbac).
4. Avoiding induction, especially for postdates, may significantly reduce morbidities.
5. Working with institutions and colleagues to reduce the VBAC ban will provide mothers with true informed consent and choice.

Nurse-midwives have access to substantial evidence-based literature supporting VBAC and can effect change for the reproductive rights of women by offering them the chance for truly informed consent and choice, hallmarks of the midwifery model of care.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 13.1

VBAC: Navigating Between Emotion and Reason

Clara, a 25-year-old, gravida 4 para 2 2012, enters nurse-midwifery care at 19 weeks' gestation in good health with no significant medical issues. Her obstetrical history includes a previous vaginal birth followed by a cesarean birth. After offering Clara the options of vaginal birth after cesarean (VBAC) trial of labor (TOL) or elective repeat cesarean delivery (ERCD), the nurse-midwife discusses the risk and benefits of each birth mode, providing her written educational materials and website link information.

At her next visit at 23 weeks, Clara informs her nurse-midwife that she has decided to have ERCD as she is afraid of uterine rupture and of losing her baby. She recalls learning somewhere that as many as 6000 babies could die from ruptures. After confirming that she wishes to discuss the statistics again, the nurse-midwife provides the correct information about risk, that the risk of a baby dying as a result of uterine rupture in VBAC is very small (20/100,000), not much different than her very small risk of dying from ERCD (13.4/100,000). In everyday terminology, the 6000 figure is explained as representing perinatal deaths per 100,000 uterine ruptures.

At the end of this conversation, Clara said it seemed like it was not as frightening as she had thought. She said her friend Sarah had just a VBAC and she would talk with her. The nurse-midwife reassures Clara that she can plan either VBAC or ERCD and can change her mind again if she wishes.

At her 32-week visit, Clara informs the nurse-midwife she wants to attempt a VBAC. Clara, her partner, and the nurse-midwife make a birth plan that includes

(continued)

CASE STUDY *(continued)*

avoiding induction and augmentation during labor and staying home in early labor.

At 40 5/7 weeks, Clara goes into spontaneous labor. In early labor, a doula stays with Clara and her partner at home as a support person. When labor progresses, Clara, her partner, and the doula leave for the hospital, where the nurse-midwife determines that Clara is 6-cm dilated, 100% effaced, and +1 station. Labor progresses well with the membranes rupturing spontaneously right before the birth. Clara gives birth to a robust baby with Apgar scores of 8 and 9 and breastfeeds her baby girl immediately.

Exemplar of Best Practice

The nurse-midwife used the scientific evidence to present the options of VBAC and ERCD in an unbiased manner, allowing Clara time to process information and to change her mind. This approach empowered Clara to make an informed decision about her mode of delivery. The nurse-midwife also provided appropriate education materials and assisted in developing a birth plan employing best practices for a VBAC TOL.

REFERENCES

Agency for Healthcare Research and Quality. (2010). *Healthcare cost and utilization project (HCUP)*. Retrieved from http://hcupnet.ahrq.gov/

Albers, L. L. (2005). Safety of VBACs in birth centers: Choices and risks. *Birth*, *32*(3), 229–231.

Almeida, E. C., Nogueira, A. A., Candido dos Reis, F. J., & Rosa e Silva, J. C. (2002). Cesarean section as a cause of chronic pelvic pain. *International Journal of Gynaecology and Obstetrics*, *79*(2), 101–104.

American College of Obstetricians and Gynecologists. (1999). ACOG practice bulletin. Vaginal birth after previous cesarean delivery. Number 5, July 1999 (Replaces practice bulletin number 2, October 1998). Clinical management guidelines for obstetrician-gynecologists. *International Journal of Gynaecology and Obstetrics*, *66*(2), 197–204.

American College of Obstetricians and Gynecologists. (2010). ACOG Practice Bulletin No. 115: Vaginal birth after previous cesarean delivery. *Obstetrics & Gynecology*, *116*(2 Pt. 1), 450–463.

American Hospital Association. (2008). *Annual survey database for fiscal year 2007*. Chicago, IL: Health Forum.

American Hospital Association. (2009). *Hospital statistics, 2009 edition: The comprehensive resource for analysis and comparison of hospital trends (hospital statistics)*. Chicago, IL: Health Forum.

Ananth, C. V., & Wilcox, A. J. (2001). Placental abruption and perinatal mortality in the United States. *American Journal of Epidemiology*, *153*(4), 332–337.

Avery, M. D., Carr, C. A., & Burkhardt, P. (2004). Vaginal birth after cesarean section: A pilot study of outcomes in women receiving midwifery care. *Journal of Midwifery & Women's Health*, *49*(2), 113–117.

Bassett, K. L., Iyer, N., & Kazanjian, A. (2000). Defensive medicine during hospital obstetrical care: A byproduct of the technological age. *Social Science & Medicine*, *51*(4), 523–537.

Biasucci, G., Rubini, M., Riboni, S., Morelli, L., Bessi, E., & Retetangos, C. (2010). Mode of delivery affects the bacterial community in the newborn gut. *Early Human Development*, *86*(Suppl. 1), 13–15.

Birthing Beautiful Ideas. (2011). *VBAC scare tactics*. Retrieved from http://birthing beautifulideas.com/?page_id=674

Carr, C. A., Burkhardt, P., & Avery, M. (2002). Vaginal birth after cesarean birth: A national survey of U.S. midwifery practice. *Journal of Midwifery & Women's Health*, *47*(5), 347–352.

Caughey, A. B. (2009). Informed consent for a vaginal birth after previous cesarean delivery. *Journal of Midwifery & Women's Health*, *54*(3), 249–253.

Centers for Disease Control and Prevention. (2010). *Unintended pregnancy prevention*. Retrieved from http://www.cdc.gov/reproductivehealth/UnintendedPregnancy/

Coleman, V. H., Erickson, K., Schulkin, J., Zinberg, S., & Sachs, B. P. (2005). Vaginal birth after cesarean delivery: Practice patterns of obstetrician-gynecologists. *The Journal of Reproductive Medicine for the Obstetrician and Gynecologist*, *50*(4), 261–266.

Declercq, E. R., Sakala, C., Corry, M., & Applebaum, S. (2007). Listening to mothers: Report of the second national U.S. survey of women's childbearing experiences. *The Journal of Perinatal Education*, *16*(4), 15–17.

DeFranco, E. A., Rampersad, R., Atkins, K. L., Odibo, A. O., Stevens, E. J., Peipert, J. F., . . . Macones, G. A. (2007). Do vaginal birth after cesarean outcomes differ based on hospital setting? *American Journal of Obstetrics and Gynecology*, *197*(4), 400.e1–400.e6.

Dewey, K. G., Nommsen-Rivers, L. A., Heinig, M. J., & Cohen, R. J. (2003). Risk factors for suboptimal infant breastfeeding behavior, delayed onset of lactation, and excess neonatal weight loss. *Pediatrics*, *112*(3 Pt. 1), 607–619.

Dinsmoor, M. J., & Brock, E. L. (2004). Predicting failed trial of labor after primary cesarean delivery. *Obstetrics and Gynecology*, *103*(2), 282–286.

Eden, K. B., Hashima, J. N., Osterweil, P., Nygren, P., & Guise, J. M. (2004). Childbirth preferences after cesarean birth: A review of the evidence. *Birth*, *31*(1), 49–60.

Eden, K. B., McDonagh, M., Denman, M. A., Marshall, N., Emeis, C., Fu, R., . . . Guise, J. M. (2010). New insights on vaginal birth after cesarean: Can it be predicted? *Obstetrics and Gynecology*, *116*(4), 967–981.

Evans, K. C., Evans, R. G., Royal, R., Esterman, A. J., & James, S. L. (2003). Effect of caesarean section on breast milk transfer to the normal term newborn over the first week of life. *Archives of Disease in Childhood. Fetal and Neonatal Edition*, *88*(5), F380–F382.

Frost, J., Shaw, A., Montgomery, A., & Murphy, D. J. (2009). Women's views on the use of decision aids for decision making about the method of delivery following a previous caesarean section: Qualitative interview study. *BJOG: An International Journal of Obstetrics and Gynaecology*, *116*(7), 896–905.

Gregory, K. D., Fridman, M., & Korst, L. (2010). Trends and patterns of vaginal birth after cesarean availability in the United States. *Seminars in Perinatology*, *34*(4), 237–243.

Gregory, K. D., Korst, L. M., Fridman, M., Shihady, I., Broussard, P., Fink, A., & Burnes Bolton, L. (2008). Vaginal birth after cesarean: Clinical risk factors associated with adverse outcome. *American Journal of Obstetrics and Gynecology*, *198*(4), 452.e1–452.e12.

Grobman, W. A., Gilbert, S., Landon, M. B., Spong, C. Y., Leveno, K .J., Rouse, D. J., . . . Mercer, B. M. (2007). Outcomes of induction of labor after one prior cesarean. *Obstetrics and Gynecology*, *109*(2 Pt. 1), 262–269.

Grobman, W. A., Lai, Y., Landon, M. B., Spong, C. Y., Rouse, D. J., Varner, M. W., . . . Sorokin, Y. (2011). The change in the rate of vaginal birth after caesarean section. *Paediatric and Perinatal Epidemiology*, *25*(1), 37–43. doi:10.1111/j.1365-3016.2010.01169.x

Guise, J. M., Denman, M. A., Emeis, C., Marshall, N., Walker, M., Fu, R., . . . McDonagh, M. (2010). Vaginal birth after cesarean: New insights on maternal and neonatal outcomes. *Obstetrics and Gynecology*, *115*(6), 1267–1278.

Guise, J. M., Eden, K., Emeis, C., Denman, M. A., Marshall, N., Fu, R., . . . McDonagh, M. (2010). *Vaginal birth after cesarean: New insights* (Evidence Report/Technology Assessment No. 191, AHRQ Publication No. 10-E003). Rockville, MD: Agency for Healthcare Research and Quality.

Guise, J. M., McDonagh, M., Hashima, J., Kraemer, D. F., Eden, K. B., Berlin, M., . . . Helfand, M. (2003). *Vaginal birth after cesarean (VBAC). Volume I: Evidence report and appendixes* (Evidence Report/Technology Assessment No. 71). Rockville, MD: Agency for Healthcare Research and Quality.

Hamilton, B. E., Martin, J. A., & Ventura, S. J. (2010). *Births: Preliminary data for 2009* (National Vital Statistics Reports, Vol. 59, No. 3). Hyattsville, MD: National Center for Health Statistics.

Hannah, M. E., Whyte, H., Hannah, W. J., Hewson, S., Amankwah, K., Cheng, M., . . . Willan, A. (2004). Maternal outcomes at 2 years after planned cesarean section versus planned vaginal birth for breech presentation at term: The international randomized Term Breech Trial. *American Journal of Obstetrics and Gynecology*, *191*(3), 917–927.

Harrington, L. C., Miller, D. A., McClain, C. J., & Paul, R. H. (1997). Vaginal birth after cesarean in a hospital-based birth center staffed by certified nurse-midwives. *Journal of Nurse-Midwifery*, *42*(4), 304–307.

Hemminki, E. (1996). Impact of caesarean section on future pregnancy—A review of cohort studies. *Paediatric and Perinatal Epidemiology*, *10*(4), 366–379.

International Cesarean Awareness Network. (2011a). *VBAC hospital policy information*. Retrieved from http://ican-online.org/vbac-ban-map

International Cesarean Awareness Network. (2011b). *VBAC policies in U.S. hospitals*. Retrieved from http://ican-online.org/vbac-ban-info

Jordan, R. G., & Murphy, P. A. (2009). Risk assessment and risk distortion: Finding the balance. *Journal of Midwifery & Women's Health*, *54*(3), 191–200.

Kaimal, A. J., & Kuppermann, M. (2010). Understanding risk, patient and provider preferences, and obstetrical decision making: Approach to delivery after cesarean. *Seminars in Perinatology*, *34*(5), 331–336.

Kennedy, H. P., & Shannon, M. T. (2004). Keeping birth normal: Research findings on midwifery care during childbirth. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *33*(5), 554–560.

Komorowski, J. (2010). *Putting uterine rupture into perspective. A woman's guide to VBAC: Navigating the NIH consensus recommendations*. Retrieved from http://givingbirthwithconfidence.org/2-2/a-womans-guide-to-vbac/putting-uterine-rupture-into-perspective/

Kotaska, A. (2010). Underestimating success and overestimating risk in VBAC. In P. Feldman, R. Cymbalise, S. Vedam, & A. Kotaska (Eds.), *Roundtable discussion: "No one can condemn you to a C-section!" Birth*, *37*(3), 245–251.

Landon, M. B., Hauth, J. C., Leveno, K. J., Spong, C. Y., Leindecker, S., Varner, M. W., . . . Gabbe, S. G. (2004). Maternal and perinatal outcomes associated with a trial of labor after prior cesarean delivery. *The New England Journal of Medicine*, *351*(25), 2581–2589.

Landon, M. B., Spong, C. Y., Thom, E., Hauth, J. C., Bloom, S. L., Varner, M. W., . . . Gabbe, S. G. (2006). Risk of uterine rupture with a trial of labor in women with multiple and single prior cesarean delivery. *Obstetrics and Gynecology*, *108*(1), 12–20.

Latendresse, G., Murphy, P. A., & Fullerton, J. T. (2005). A description of the management and outcomes of vaginal birth after cesarean birth in the homebirth setting. *Journal of Midwifery & Women's Health*, *50*(5), 386–391.

Leeman, L. M., & Plante, L. A. (2006). Patient-choice vaginal delivery? *Annals of Family Medicine*, *4*(3), 265–268.

Lieberman, E., Ernst, E. K., Rooks, J. P., Stapleton, S., & Flamm, B. (2004). Results of the national study of vaginal birth after cesarean in birth centers. *Obstetrics and Gynecology*, *104*(5 Pt. 1), 933–942.

Loos, M. J., Scheltinga, M. R., Mulders, L. G., & Roumen, R. M. (2008). The Pfannenstiel incision as a source of chronic pain. *Obstetrics and Gynecology*, *111*(4), 839–846.

Luijendijk, R. W., Jeekel, J., Storm, R. K., Schutte, P. J., Hop, W. C., Drogendijk, A. C., & Huikeshoven, F. J. (1997). The low transverse Pfannenstiel incision and the prevalence of incisional hernia and nerve entrapment. *Annals of Surgery*, *225*(4), 365–369.

Lydon-Rochelle, M. T., Cahill, A. G., & Spong, C. Y. (2010). Birth after previous cesarean delivery: Short-term maternal outcomes. *Seminars in Perinatology*, *34*(4), 249–257.

Lydon-Rochelle, M. T., Holt, V. L., Easterling, T. R., & Martin, D. P. (2001). Risk of uterine rupture during labor among women with a prior cesarean delivery. *The New England Journal of Medicine*, *345*(1), 3–8.

MacDorman, M. F., & Kirmeyer, S. (2005). Fetal and perinatal mortality. *National Vital Statistics Reports*, *57*(8), 1–19.

MacKenzie, I. Z., Shah, M., Lean, K., Dutton, S., Newdick, H., & Tucker, D. E. (2007). Management of shoulder dystocia: Trends in incidence and maternal and neonatal morbidity. *Obstetrics and Gynecology*, *110*(5), 1059–1068.

Martin, J. A., Hamilton, B. E., Sutton, P. D., Ventura, S. J., Menacker, F., Kirmeyer, S., & Mathews, T. J. (2009). *Births: Final data for 2006* (National Vital Statistics Reports, Vol. 57, No. 7). Hyattsville, MD: National Center for Health Statistics.

McMahon, M. J., Luther, E. R., Bowes, W. A., Jr., & Olshan, A. F. (1996). Comparison of a trial of labor with an elective second cesarean section. *The New England Journal of Medicine*, *335*(10), 689–695.

Mercer, B. M., Gilbert, S., Landon, M. B., Spong, C. Y., Leveno, K. J., Rouse, D. J., . . . Ramin, S. M. (2008). Labor outcomes with increasing number of prior vaginal births after cesarean delivery. *Obstetrics and Gynecology*, *111*(2 Pt. 1), 285–291.

Minkoff, H., & Fridman, D. (2010). The immediately available physician standard. *Seminars in Perinatology*, *34*(5), 325–330.

Moffat, M. A., Bell, J. S., Porter, M. A., Lawton, S., Hundley, V., Danielian, P., & Bhattacharya, S. (2007). Decision making about mode of delivery among pregnant women who have previously had a caesarean section: A qualitative study. *BJOG: An International Journal of Obstetrics and Gynaecology*, *114*(1), 86–93.

Mollison, J., Porter, M., Campbell, D., & Bhattacharya, S. (2005). Primary mode of delivery and subsequent pregnancy. *BJOG: An International Journal of Obstetrics and Gynaecology*, *112*(8), 1061–1065.

Murphy, D. J., & MacKenzie, I. Z. (1995). The mortality and morbidity associated with umbilical cord prolapse. *British Journal of Obstetrics and Gynaecology*, *102*(10), 826–830.

Murphy, D. J., Stirrat, G. M., & Heron, J. (2002). The relationship between caesarean section and subfertility in a population-based sample of 14,541 pregnancies. *Human Reproduction*, *17*(7), 1914–1917.

National Institutes of Health. (2010). *National Institutes of Health consensus development conference statement: Vaginal birth after cesarean: New insights*. Retrieved from http://consensus.nih.gov/2010/images/vbac/vbac_statement.pdf

Nikolajsen, L., Sørensen, H. C., Jensen, T. S., & Kehlet, H. (2004). Chronic pain following caesarean section. *Acta Anaesthesiologica Scandinavica*, *48*(1), 111–116.

O'Shea, T. M., Klebanoff, M. A., & Signore, C. (2010). Delivery after previous cesarean: Long-term outcomes in the child. *Seminars in Perinatology*, *34*(4), 281–292.

Patel, R. M., & Jain, L. (2010). Delivery after previous cesarean: Short-term perinatal outcomes. *Seminars in Perinatology*, *34*(4), 272–280.

Perl, L. M. (2010). The birth and death of VBACs in a rural community hospital. *Birth*, *37*(3), 257–258. doi:10.1111/j.1523-536X.2010.00414.x

Phillips, E., McGrath, P., & Vaughan, G. (2009). "I wanted desperately to have a natural birth": Mothers' insights on vaginal birth after caesarean (VBAC). *Contemporary Nurse*, *34*(1), 77–84.

Placek, P. J., & Taffel, S. M. (1988). Vaginal birth after cesarean (VBAC) in the 1980s. *American Journal of Public Health*, *78*(5), 512–515.

Roberts, R. G., Deutchman, M., King, V. J., Fryer, G. E., & Miyoshi, T. J. (2007). Changing policies on vaginal birth after cesarean: Impact on access. *Birth*, *34*(4), 316–322.

Romano, A. M., Gerber, H., & Andrews, D. (2010). Social media, power, and the future of VBAC. *The Journal of Perinatal Education*, *19*(3), 43–52.

Rozen, G., Ugoni, A. M., & Sheehan, P. M. (2011). A new perspective on VBAC: A retrospective cohort study. *Women and Birth*, *24*(1), 3–9.

Russillo, B., Sewitch, M. J., Cardinal, L., & Brassard, N. (2008). Comparing rates of trial of labour attempts, VBAC success, and fetal and maternal complications among family physicians and obstetricians. *Journal of Obstetrics and Gynaecology Canada*, *30*(2), 123–128.

Shorten, A., Shorten, B., Keogh, J., West, S., & Morris, J. (2005). Making choices for childbirth: A randomized controlled trial of a decision-aid for informed birth after cesarean. *Birth*, *32*(4), 252–261.

Silver, R. M. (2010). Delivery after previous cesarean: Long-term maternal outcomes. *Seminars in Perinatology*, *34*(4), 258–266.

Silver, R. M., Landon, M. B., Rouse, D. J., Leveno, K. J., Spong, C. Y., Thom, E. A., . . . Mercer, B. M. (2006). Maternal morbidity associated with multiple repeat cesarean deliveries. *Obstetrics and Gynecology*, *107*(6), 1226–1232.

Spong, C. Y., Landon, M. B., Gilbert, S., Rouse, D. J., Leveno, K. J., Varner, M. W., . . . Mercer, B. M. (2007). Risk of uterine rupture and adverse perinatal outcome at term after cesarean delivery. *Obstetrics and Gynecology*, *110*(4), 801–807.

Tower, C. L., Strachan, B. K., & Baker, P. N. (2000). Long-term implications of caesarean section. *Journal of Obstetrics and Gynaecology*, *20*(4), 365–367.

Ventura, S. J., Martin, S. A., Curtin, S. C., & Mathews, T. J. (1998). *Report of final natality statistics, 1996* (Monthly Vital Statistics Report, Vol. 46, No. 11). Hyattsville, MD: National Center for Health Statistics.

Wells, C. E. (2010). Vaginal birth after cesarean delivery: Views from the private practitioner. *Seminars in Perinatology*, *34*(5), 345–350.

Wen, S. W., Rusen, I. D., Walker, M., Liston, R., Kramer, M. S., Baskett, T., . . . Lui, S. (2004). Comparison of maternal mortality and morbidity between trial of labor and elective cesarean section among women with previous cesarean delivery. *American Journal of Obstetrics and Gynecology*, *191*(4), 1263–1269.

Zweifler, J., Garza, A., Hughes, S., Stanich, M. A., Hierholzer, A., & Lau, M. (2006). Vaginal birth after cesarean in California: Before and after a change in guidelines. *Annals of Family Medicine*, *4*(3), 228–234.

The Second Stage of Labor: Using the Evidence to Protect Normal Birth

14

Kathryn Osborne

HISTORICAL APPROACHES TO SECOND-STAGE LABOR MANAGEMENT

The *second stage of labor* has historically been defined as the interval between the time when the cervix reaches full dilatation (10 cm) and the birth of the baby (Friedman, 1954). During the second stage of labor, women often experience regular, frequent contractions, rectal and vaginal pressure, and an overwhelming urge to bear down. The care of women during second-stage labor typically includes behaviors that begin with an announcement that the woman is fully dilated and therefore ready to push, and continues with instruction for the woman to hold her breath and push, often in supine positions, for prolonged periods with each contraction (Hanson, 2006). Despite a lack of evidence regarding the efficacy and safety of this approach, it has been used by maternity care providers for decades in an attempt to hasten fetal descent and shorten the length of the second stage (Barnett & Humenick, 1982; Beynon, 1957; Bloom, Casey, Schaffer, McIntire, & Leveno, 2006; Roberts & Hanson, 2007).

Dr. Grantly Dick Read (1947) was among the first to describe the safety and efficacy of the involuntary pushing that occurs as a woman reaches second stage during what he referred to as *physiological labor*, or labor undisturbed by mechanical, physical, or psychological interventions. Roberts and Woolley (1996) have described physiologic management of second-stage labor as care that focuses on a woman's response to labor and the provision of measures to support the maternal response (p. 415). This physiologic management is in contrast to active management, wherein the birth attendant provides specific directions about when and how to push, using an arbitrary set of parameters including onset of complete cervical dilatation and total duration of second stage, regardless of the sensations a woman experiences (J. Roberts & Woolley, 1996). For more than 30 years, researchers have been examining the impact of various approaches to pushing on maternal and fetal well-being. This chapter examines the evidence for best practices comparing supportive versus directive approaches to maternal bearing-down efforts and maternal positions during second-stage labor.

SECOND-STAGE LABOR: THE EVIDENCE FOR BEST PRACTICE

Although the first recommendations to reform second-stage labor care were published more than half a century ago (Beynon, 1957; Read, 1947), there was very little research on the impact of various approaches on maternal and fetal well-being. A landmark descriptive study examined nondirective second-stage pushing with 12 uncomplicated primigravidas. All were instructed to push in response to physiologic urges. They were not directed to use closed-glottis pushing for prolonged periods, with each contraction and all participants assumed a sitting or semi-sitting position during second stage. In addition to describing the self-regulated (spontaneous) bearing-down efforts of the participants, the researchers used cord blood samples (both venous and arterial) to measure fetal well-being. On all measures, the researchers identified higher levels of pO_2, lower levels of pCO_2, and improved pH values in the participants when compared to values that were considered "normal" at that time (Caldeyro-Barcia et al., 1981). Although this study was limited by its small sample size, it laid the foundation for subsequent research on second-stage labor management.

Spontaneous Pushing Behaviors in Second-Stage Labor

Spontaneous bearing-down efforts are the expulsive efforts that occur when women are allowed to push in response to the sensations and urges they experience during second stage. These bearing-down efforts aid in fetal descent as the fetus completes the cardinal movements of labor, rotating and descending through the maternal pelvis (Liao, Buhimschi, & Norwitz, 2005).

Physiologic Response

Early investigators have documented the physiologic response to second-stage labor when women were allowed to push spontaneously rather than in response to directions from the birth attendant about when and how to push (Beynon, 1957; Caldeyro-Barcia et al., 1981; Read, 1947). Observations of women who responded spontaneously to the physiologic sensations of second-stage labor have revealed that women often feel the initial urge to bear down when the fetal head reaches +1 station and that many women spontaneously initiate bearing-down efforts prior to complete cervical dilatation (J. E. Roberts et al.,1987).

The frequency and force of spontaneous bearing-down efforts are also significantly different from the frequency and force of bearing-down efforts that are made when women are instructed to "take a deep breath, hold it, and push while I count to ten . . . and let's try to get three of these pushes in with each contraction." Women who push spontaneously put forth an average of 4.29 bearing-down efforts per contraction with the duration of each effort lasting from 0.93 to 5.78 seconds, the shortest efforts occurring as the contraction peaks (Caldeyro-Barcia et al., 1981), and an increase in the number of bearing-down efforts per contraction as labor progresses (Caldeyro-Barcia et al., 1981; J. E. Roberts et al., 1987). The intensity

of bearing-down efforts varies between contractions, with a general increase in intrauterine pressure exerted as second-stage labor progresses (Caldeyro-Barcia et al., 1981; J. E. Roberts et al., 1987). Finally, in contrast to women who are directed to "take a deep breath and hold it," women who push spontaneously take several breaths between bearing-down efforts during each contraction (Caldeyro-Barcia et al., 1981), and most bearing-down efforts are accompanied by a release of air with periods of breath holding that last no more than 4 to 6 seconds (J. E. Roberts et al., 1987).

Several investigators have also identified and described the phasic nature of second-stage labor. The latent phase (Simkin, 1984) or the lull (Aderhold & Roberts, 1991) marks the time from complete cervical dilatation until the expression of an urge to push and is characterized by contractions that occur less frequently and with less intensity (Aderhold & Roberts, 1991; Piquard, Schaefer, Hsiung, Dellenbach, & Haberey, 1989; Simkin, 1984). The active phase (Simkin, 1984) is generally the longest phase of second stage and is characterized by *active bearing down* (Aderhold & Roberts, 1991) as contractions become increasingly regular and strong. This active phase lasts until crowning of the fetal head, marking the onset of the transition (Simkin, 1984) or perineal phase (Aderhold & Roberts, 1991), often characterized by intense burning and pain as the fetal head emerges.

Duration of Second Stage

If a woman's response to contractions in the second-stage labor allows for efficient expulsion of the fetus, why then is it routine practice to direct women about when and how to push in birth rooms across the United States? One explanation is concern for the safety of the mother and fetus during second-stage labor and recommendations that a shorter second stage is better for both (Barnett & Humenick, 1982; Perry & Porter, 1979). For decades, women have been taught and/or directed to push in an attempt to hasten birth and shorten the second stage of labor (Beynon, 1957; Perry & Porter, 1979). However, a study by Cohen (1977) demonstrated no significant increase in perinatal mortality or neonatal death related to the duration of second stage. This retrospective review of records ($n = 4403$) of nulliparous women in second-stage labor revealed no correlation between longer second stage and low 5-minute Apgar scores. Although the findings of this study suggested an association between maternal hemorrhage, infection, and longer second stage, these findings were attributed to higher rates of midforceps and cesarean birth among women with longer second stage (Cohen, 1977).

Despite these early findings, maternity care providers in the United States have continued to impose arbitrary limits on the length of second stage. In response to the routine practice of imposing limits on the second stage in spite of the earlier work by Cohen (1977), subsequent studies have examined the relationship between length of second stage and perinatal outcomes, revealing no relationship between prolonged second stage and adverse maternal (Albers, 1999; Albers, Schiff, & Gorwoda, 1996; Badiou et al., 2010; Cohen, 1984) or fetal/neonatal outcomes (Albers, 1999; Albers et al., 1996; Cohen, 1984; Menticoglou, Manning, Harman, & Morrison, 1995; Myles & Santolaya, 2003).

Duration of Second Stage With Epidural Anesthesia

Following the publication of studies revealing that women with epidural anesthesia experienced a longer second stage without deleterious maternal or fetal effects (Kilpatrick & Laros, 1989), American College of Obstetricians and Gynecologists (ACOG) amended the criteria for diagnosing prolonged second stage. Without epidural anesthesia, the ACOG defines prolonged second stage as more than 2 hours in nulliparous women and more than 1 hour in multiparous women. For women with epidural anesthesia, prolonged second stage is defined as more than 3 hours for nulliparous women and more than 2 hours for multiparous women (ACOG, 2003).

Increasing rates of epidural anesthesia raised questions about optimal approaches to maternal bearing down. Researchers began to focus on the maternal and fetal effects of laboring down, an approach to second-stage labor management wherein the woman is allowed to rest until she expresses an urge to push, allowing passive descent of the fetus (McCartney, 1998). In an early randomized controlled trial (RCT) examining the effects of delayed versus early pushing in primigravidas with epidural anesthesia, Maresh, Choong, and Beard (1983) identified that delayed pushing had no harmful fetal effects and was associated with higher rates of spontaneous vaginal birth. Further, the authors identified that although the women who delayed pushing had a significantly longer ($p < .01$) mean duration of second-stage labor (170 minutes) than women who pushed early (78 minutes), delayed pushing had no significant effect on mean active pushing time (49 minutes, early; 53 minutes, delayed); (Maresh et al., 1983).

Subsequent RCTs examining differences in outcomes for early versus delayed pushing in women with epidural anesthesia show similar findings. These findings include the following when pushing is delayed:

1. Longer second-stage labor but no difference in mean duration of active pushing (Fitzpatrick et al., 2002; Vause, Congdon, & Thornton, 1998),
2. Shorter duration of active pushing (Fraser et al., 2000; Gillesby et al., 2010; Hansen, Clark, & Foster, 2002; Kelly et al., 2010; Simpson & James, 2005),
3. No adverse maternal or fetal effects (Fitzpatrick et al., 2002; Fraser et al., 2000; Hansen et al., 2002; Kelly et al., 2010; Vause et al., 1998),
4. Improved fetal and maternal outcomes (Gillesby et al., 2010; Simpson & James, 2005),
5. Lower rates of cesarean birth (Fitzpatrick et al., 2002; Fraser et al., 2000),
6. Lower rates of instrument-assisted births (Fraser et al., 2000), and
7. Less maternal fatigue (Hansen et al., 2002).

Systematic reviews and meta-analyses of RCTs examining the outcomes of early versus delayed pushing for women with epidural anesthesia have confirmed findings of

1. increased total length of second-stage labor with no difference between groups for duration of active pushing (C. L. Roberts, Torvaldsen, Cameron, & Olive, 2004),
2. reduced mean duration of time spent pushing for women who delay pushing during second stage (Brancato, Church, & Stone, 2008),

3. overall reduction in operative births with delayed pushing (Brancato et al., 2008; C. L. Roberts et al., 2004), and
4. no adverse maternal or fetal effects associated with delayed pushing (Brancato et al., 2008; C. L. Roberts et al., 2004).

Effects of Prolonged Second Stage

Recent studies examining the effects of prolonged second stage on maternal and neonatal outcomes have identified an association between prolonged second stage and chorioamnionitis, third- and fourth-degree perineal laceration, and uterine atony (Rouse et al., 2009); perineal trauma (Allen, Baskett, O'Connell, McKeen, & Allen, 2009; Rouse et al., 2009); and postpartum hemorrhage (Allen et al., 2009; Le Ray, Audibert, Goffinet, & Fraser, 2009; Lu et al., 2009). Findings relative to neonatal morbidity associated with prolonged second stage have included increased rates of admission to the neonatal intensive care unit (Allen et al., 2009; Rouse et al., 2009) and lower 5-minute Apgar scores (Allen et al., 2009). Although these studies have found association between prolonged second stage and adverse maternal and neonatal outcomes, it is unclear if the association is causative. A limitation of these studies is that they did not differentiate between total duration of second-stage labor and time actively pushing. The majority of study participants (>90%) were under the effects of epidural anesthesia.

Supportive Versus Directive Approaches to Maternal Bearing Down

A review of the literature regarding second-stage labor reveals that there are two distinct approaches to second-stage labor care: supportive and directive (J. M. Roberts, González, & Sampselle, 2007; J. Roberts & Hanson, 2007). Birth attendants who use a supportive approach wait until the woman in labor expresses an urge to bear down, at which time they encourage the woman to bear down in response to her perceived physiologic sensations. With the directive approach, birth attendants mark the onset of second-stage labor with complete cervical dilatation (which must be determined using a digital pelvic exam), at which time they instruct the woman to hold her breath and push (usually to the count of 10), regardless of the woman's physiologic sensations. Despite a lack of evidence to support the use of this technique, most women in the United States report being cared for with directive approaches during the second stage of labor (Declercq, Sakala, Corry, & Applebaum, 2007).

In addition to delaying the initiation of bearing down until the onset of an urge to push, the primary differences in the two approaches to second-stage labor care is that, when using the directive approach, bearing down is usually done with the breath held through a closed glottis and in response to commands from a care provider (coached). When using the supportive approach, bearing down is usually done with an open glottis, limited breath holding, and in response to the physiologic sensations experienced by the woman in labor (uncoached). Much of the research conducted during the past 30 years has focused on identifying differences in maternal and fetal/neonatal outcomes when open- versus closed-glottis pushing is used, and when the bearing-down efforts are coached versus uncoached.

Open- Versus Closed-Glottis Pushing

The primary differences in outcomes between open- and closed-glottis pushing are likely related to the exchange of air that occurs with open-glottis pushing. Closed-glottis or Valsalva pushing requires that a woman takes a deep breath and holds it for prolonged periods while bearing down against a closed glottis. Physiologically, the use of this technique results in increased intrathoracic and intra-abdominal pressure, decreased cardiac output with subsequent vasoconstriction, increased intrauterine pressure, and a progressive decrease in maternal and uterine blood flow (Barnett & Humenick, 1982).

Several quasi-experimental studies have been conducted to examine the effects of closed- versus open-glottis pushing on the maternal–fetal dyad. Findings of these studies have revealed that open-glottis pushing results in significantly higher umbilical vein pH (Barnett & Humenick, 1982) and no significant increase in duration of second-stage labor (Paine & Tinker, 1992). Recently conducted systematic reviews of RCTs examining the effect of spontaneous pushing versus closed-glottis pushing in women without epidural anesthesia demonstrated that although closed-glottis pushing may shorten the duration of second-stage labor, it should be discouraged because of the deleterious effects of Valsalva pushing on maternal urodynamic factors (Prins, Boxem, Lucas, & Hutton, 2011).

Coached Versus Uncoached Pushing

Directive approaches to second-stage labor usually include "coaching" women to ignore the physiologic urges they experience during second stage and instead bear down in response to commands from the birth attendant. Using this approach, women are often instructed to take a deep breath and hold it to the count of 10 while bearing down, which usually results in closed-glottis pushing. In contrast, supportive approaches encourage women to push in an uncoached fashion in response to their perceived physiologic sensations.

In a quasi-experimental pilot study examining the effects of spontaneous versus directed bearing down, Yeates and Roberts (1984) identified that most women experienced an urge to push before the cervix was fully dilated. The investigators also identified no significant differences in mean duration of second stage, Apgar scores, or the expenditure of maternal energy between groups. They also found greater perineal integrity among women who pushed spontaneously. RCTs examining the differences in outcomes for coached versus uncoached pushing have revealed that, although uncoached pushing may result in a longer second stage (Bloom et al., 2006; Thomson, 1993), prolonged second stage only had an impact on venous cord pH when women used coached, closed-glottis pushing (Thomson, 1993). Further, coached pushing was found to be significantly associated with negative maternal urogynecologic effects (Schaffer et al., 2005). Investigators have concluded that coached pushing is a modifiable obstetric practice with potentially negative effects (Schaffer et al., 2005) that offers no short-term benefits for the mother or baby (Bloom et al., 2006).

The Impact of Approaches on Maternal and Neonatal Outcomes

In addition to the findings of studies that reveal improved maternal and neonatal outcomes with uncoached open-glottis pushing, several studies have been conducted to examine the overall effect of pushing techniques on maternal and fetal/neonatal outcomes. Findings of these studies have revealed that spontaneous pushing results in improved neonatal outcomes and improved maternal satisfaction (Yildirim & Beji, 2008). Spontaneous bearing down is also associated with higher rates of perineal integrity and less perineal trauma (Albers, Sedler, Bedrick, Teaf, & Peralta, 2006), as well as less maternal fatigue (Hansen et al., 2002; Lai, Lin, Li, Shey, & Gau 2009). Measures are currently underway to conduct a Cochrane Collaboration systematic review of RCTs and quasi-experimental studies in order to identify the benefits and potential disadvantages of various approaches to bearing down and breathing during the expulsive stage of labor on maternal and fetal outcomes (Lemos et al., 2011).

The Use of Non-Supine Positions During Second-Stage Labor

Historically and around the world today, women have often given birth in upright positions. Not until the early 20th century, when place of birth moved from the home to the hospital, did women in the United States begin giving birth in supine positions (Ashford, 1988). Currently, most women in the United States give birth in supine positions (Declercq & Chalmers, 2008). Reasons for the use of supine positions in second-stage labor include easier access to the maternal abdomen for the purpose of fetal monitoring and increased caregiver comfort with the position (Gupta, Hofmeyr, & Smyth, 2009).

Over the last several decades, many investigators have examined the impact of maternal position during second-stage labor and birth on maternal and fetal/neonatal outcomes. A systematic review recently examined the risks and benefits of various positions during the second stage on maternal, fetal, and neonatal outcomes for women without epidural anesthesia. Included in the review were 20 RCTs ($n = 6135$ participants) that met inclusion criteria (Gupta et al., 2009). Findings of the review revealed that the use of non-supine positions during second-stage labor resulted in a statistically significant reduction in duration of second-stage labor, episiotomies, women's experience of severe pain, abnormal fetal heart rate patterns, and instrument-assisted births (Gupta et al., 2009).

Several studies revealed statistically significant increases in second-degree perineal lacerations and maternal blood loss when non-supine positions were used. The authors (Gupta et al., 2009) cautioned that due to methodological flaws in several studies, the findings of the review should be interpreted with caution. Moreover, the authors concluded that due to deleterious maternal and/or fetal effects of non-supine positions, women should be encouraged to give birth in the position they find most comfortable (Gupta et al., 2009). Measures are currently underway to conduct a Cochrane Collaboration systematic review of RCTs and quasi-experimental studies in order to examine the effect of various positions used during second-stage labor and birth on maternal and fetal outcomes for women with epidural anesthesia (Kibuka, Thornton, & Kingswood, 2009).

Women's Preferences in Second Stage

Central to any discussion regarding the care of women during second-stage labor are the findings of studies relative to women's experience with second-stage labor care. Most of the studies examining women's experience in second-stage labor have been qualitative in nature. When allowed to push spontaneously, women push in ways significantly different from closed-glottis pushing and directive pushing (J. E. Roberts et al., 1987; Thomson, 1995) and experience sensations in the second stage in unique ways (McKay, Barrows, & Roberts, 1990). Among the differences are variations in the timing and existence of an urge to push and feelings of relief and/or pain when actively bearing down (McKay et al., 1987).

A recently conducted RCT comparing outcomes of women with the continuous support of a midwife during labor to women without continuous support revealed that women with continuous support had a significantly shorter duration of second-stage labor (34.9 ± 25.4 vs. 55.3 ± 33.7 minutes; $p = .003$) and lower rates of operative birth (Kashanian, Javidi, & Haghighi, 2010). Women who received continuous support had a midwife with them at all times; midwifery care included among other things, education, massage, reassurance, and encouragement (Kashanian et al., 2010). A systematic review also identified the powerful impact of caregiver support on women's experience with pain and satisfaction with their birth experience (Hodnett, 2002).

These findings are consistent with the findings of a review and synthesis of qualitative studies that identified the profound importance of professional care and support during labor, in particular, women's expectations regarding care and support (Bowers, 2002).

Despite a preponderance of evidence regarding the safety and efficacy of spontaneous approaches to maternal bearing down and the use of non-supine positions for second-stage labor, most women in the United States (75%) report giving birth with direction from providers about when and how to push and most give birth in supine positions (Declercq & Chalmers, 2008; Declercq et al., 2007). This failure to use evidence in practice results in less than optimal outcomes (Albers et al., 2006; Barnett & Humenick, 1982; Bloom et al., 2006; Caldeyro-Barcia et al., 1981; Fitzpatrick et al., 2002; Gupta et al., 2009; Hansen et al., 2002; Lai et al., 2009; Le Ray et al., 2009; Maresh et al., 1983; Paine & Tinker, 1992; C. L. Roberts et al., 2004; J. E. Roberts et al., 1987; Sampselle & Hines, 1999; Schaffer et al., 2005; Thomson, 1993; Yeates & Roberts, 1984).

IMPLEMENTING THE EVIDENCE FOR BEST PRACTICE

Experts in the area of second-stage labor have identified care practices that promote the use of evidence in practice, specifically behaviors that are supportive and those that are directive. Supportive behaviors are those that encourage women to listen and respond to the strong physiologic sensations they experience during second stage. In contrast, directive behaviors are those that provide direction to women in second stage about when, how, and in which position to push. Listening to women and providing supportive care allows them to give birth in an individual time frame that is guided by the physiologic process rather than an arbitrary set of rules (see Table 14.1).

TABLE 14.1

Care Practices That Promote the Use of Evidence in Second-Stage Labor

Recommended Approaches	Author
Discuss expectations and sensations of second-stage labor with the mother in early labor and at the onset of second stage	Mayberry and Strange (1997)
Encourage women to bear down spontaneously in response to the sensations they experience	Mayberry and Strange (1997) J. E. Roberts (2003) J. Roberts and Hanson (2007) Sampselle et al. (2005)
Allow women to rest until they feel an urge to push	Mayberry and Strange (1997) J. E. Roberts (2003) J. Roberts and Hanson (2007)
Determine readiness to push based on fetal station and position	Mayberry and Strange (1997) J. Roberts and Hanson (2007)
Discourage maternal breath holding for longer than 6 seconds	Mayberry and Strange (1997)
Support involuntary pushing efforts, including grunting, groaning, and exhaling during the push	Mayberry and Strange (1997) J. E. Roberts (2003)
Validate the normalcy of the sensations the woman voices	Mayberry and Strange (1997) J. E. Roberts (2003) Sampselle et al. (2005)
Intermittent auscultation of FHR using ACOG guidelines (rather than continuous monitoring)	J. E. Roberts (2003)
Offer encouragement that limits anxiety (including feedback with vaginal exams)	J. E. Roberts (2003) Sampselle et al. (2005)
Encourage maternal positions that enhance fetal descent and reduce pain	J. E. Roberts (2003) J. Roberts and Hanson (2007)
Provide affirmation that the woman's body is working well	Sampselle et al. (2005) J. Roberts and Hanson (2007)
Affirm bearing-down efforts without providing direction	Sampselle et al. (2005) J. Roberts and Hanson (2007)
Ask for feedback from the woman about the sensations she is feeling	Sampselle et al. (2005)
Support women to actively make decisions about their care	J. E. Roberts (2003)

Note. ACOG = American College of Obstetricians and Gynecologists; FHR = fetal heart rate.

In 1995, the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) launched a research utilization project in an attempt to bring evidence to practice for labor nurses. The project also aimed to identify process issues and barriers to the implementation of a research-based practice protocol for nursing care during second-stage labor (Mayberry & Strange, 1997). The evidence-based protocol, *Management of Women in the Second Stage of Labor*, was implemented using best evidence regarding change theory on 40 hospital-based labor and birth units across the United States (Mayberry & Strange, 1997). Project coordinators faced several barriers to widespread implementation of the protocol, including

1. nurses and physicians tended to mistrust the evidence particularly when there was a change in staff following the education program;

2. although nurses were willing to try new practices, they returned to "old habits" without continuous reminders from project coordinators;
3. patients who had previously used closed-glottis pushing were often unwilling to try a new approach;
4. nurses and physicians were uncomfortable with the spontaneous noises made by women in second-stage labor; and
5. high levels of resistance among physicians who overrode the nurses using supportive approaches and intervened with directive approaches (Niesen & Quirk, 1997).

In order to identify reasons why maternity care providers who are using supportive approaches to second-stage labor care became directive, J. Roberts et al. (2007) conducted a descriptive and exploratory examination of the videotapes of 10 women in second-stage labor. Based on communication patterns, the researchers identified six reasons why caregivers changed their approach from supportive to directive:

1. Maternal fatigue;
2. Maternal pain;
3. Diminished urge to push (with or without an epidural);
4. Maternal fear or holding back;
5. Requests from a woman's support person; and
6. Fetal indications (J. Roberts et al., 2007).

Using the Evidence in Nurse-Midwifery Practice

The midwifery model of care is based on an understanding that labor and birth are natural, physiologic processes and places trust in the inherent ability of women to give birth with little or no intervention. Tenets of midwifery care include watchful waiting and intervening only when necessary. Midwives have identified "support of normalcy" as the highest ranked process of midwifery care (Kennedy, 2000). Further, midwives believe and trust in women's strength, the normalcy of birth, and tolerate wide variations in "normal." They believe in the importance of physical presence and make decisions about when to intervene based on vigilant assessment and a belief that intervention is seldom necessary (Kennedy & Shannon, 2004). An RCT ($n = 1211$) of women cared for by nurse-midwives revealed that 78.7% of the women gave birth using open-glottis pushing (Albers, Sedler, Bedrick, Teaf, & Peralta, 2005). Furthermore, a national survey of nurse-midwives revealed that most use non-supine positions for second-stage labor and birth (Hanson, 1998).

A recently conducted national survey of certified nurse-midwives (CNMs) and certified midwives (CMs) revealed that CNMs and CMs provide care during second-stage labor that is primarily supportive in nature (Osborne & Hanson, 2012). Most CNMs/CMs (82.4%) support women without epidural anesthesia to initiate bearing-down efforts only when the woman feels an urge to push, and most CNMs/CMs (67%) support maternal bearing-down efforts without providing direction. The one time that most CNMs and CMs use a more directive approach, whether caring for women with or without an epidural, is during the final contractions of

second-stage labor as the fetal head is emerging. Participants in the survey indicated that, although they usually use supportive approaches to caring for women in second-stage labor, there are circumstances under which they provide more direction. The most common of these circumstances include a change in fetal heart tones that leads the nurse-midwife to believe the birth needs to occur quickly, the appearance of maternal fatigue (emotional or physical), requests from the woman in labor to provide more direction, the level of fetal descent since initiating bearing down, the perceived ability of the woman to cope with pain, and the total duration of active pushing (Osborne & Hanson, 2012). These approaches again reflect best practice in providing an individualized approach to the care of the laboring woman.

Germane to the discussion of implementing evidence in practice is the finding that institutional circumstances, such as pressure from consulting physicians and/or nurses or time pressures that exist because of other patients the nurse-midwife needs to see, had very little influence on midwives' decision to provide more direction during second-stage labor (Osborne & Hanson, 2012). Instead, nurse-midwives individualize the care they provide and make decisions to provide more direction based on the perceived needs of the patient. The authors concluded that CNMs and CMs provide evidence-based second-stage labor care and that providing direction during second-stage labor is an intervention that is used by nurse-midwives in order to avoid potential complications (Osborne & Hanson, 2012).

Strategies for Changing Practice to Reflect Best Practices

It is clear that evidence-based best practices, including the use of supportive approaches to maternal bearing down and upright positions during second-stage labor, are being used by nurse-midwives. Because nurse-midwives in the United States are attending just more than 10% of all vaginal births (American College of Nurse-Midwives [ACNM], 2011), it is likely that nonevidence-based practices reflect care provided by other health care professionals, such as physicians and nurses, and that implementing evidence-based practice will require a substantial change in the way labor and birth care is provided.

Lewin's *change theory* provides a framework for the implementation of evidence-based second-stage labor care and consists of three important stages: "unfreezing, moving to a new level or changing, and refreezing" (Current Nursing, 2011). During the "unfreezing" stage, forces that serve as barriers to the implementation of evidence-based second-stage care practices must be identified as well as strategies that support maternity care providers as they let go of "old ways" of providing care. One way to accomplish this in clinical practice settings is through the use of focus groups and/or surveys that allow providers to express concerns regarding a change in practice.

Moving to new levels (changing practice) requires a change in thoughts, feelings, and/or behaviors (Current Nursing, 2011). It is likely that this change will require widespread dissemination of information regarding the evidence and best practices. During this stage, it will be important for maternity care providers to gain information to the extent that they believe that change is necessary. Along with the acquisition of new knowledge comes the implementation of that knowledge in

practice. It will then become necessary to "refreeze" care practices to prevent care providers from reverting to the use of outdated approaches to second-stage labor care. This can be accomplished through repeated education sessions, the establishment of evidence-based practice guidelines, and the evaluation of the effectiveness of new approaches. The evidence regarding second-stage labor is clear: The use of supportive approaches and upright positions during second stage labor results in optimal maternal and fetal/neonatal outcomes. Nurse-midwives can lead the way in implementing these evidence-based best practices into the clinical environment.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 14.1

Supporting the Physiologic Process in the Second Stage of Labor

Sally is a 27-year-old gravida 1 para 0 woman who was admitted to the maternity triage area at 39 weeks' gestation in early labor. Sally began prenatal care at 6 weeks' gestation and her prenatal course was uneventful. At midnight, initial assessment upon admission revealed that the patient's cervix was 4-cm dilated and 100% effaced with the vertex at −1 station; the patient was having regular contractions every 2 to 3 minutes that lasted 60 to 90 seconds. By 3:00 a.m., Sally was transferred to the maternity care unit, the fetal monitor was applied, and the nurse-midwife was notified of the admission. At 4:00 a.m., the nurse-midwife arrived and reexamined Sally's cervix; the exam revealed that the cervix was 9-cm dilated and completely effaced with the vertex at 0 station. One hour later, the midwife repeated the cervical exam and found the patient to be fully dilated with the vertex at 0 station. Sally was informed she was ready to push.

Although the fetal monitor tracing had been within normal limits since admission, continuous external fetal monitoring was being used at the onset of second stage. Sally was positioned flat on her back with her legs fully flexed at the hips and knees, fully supported by the nurse-midwife and Sally's husband. The nurse-midwife explained that as soon as the next contraction began, Sally should take in two full breaths and blow them out and then take in a third breath and hold it while she pushed; the nurse-midwife would count during the push and each push should be held to the count of 10. After attempting to push with the first contraction, Sally asked the nurse-midwife if she could please wait a while to push, at least until she felt the urge.

Reflecting on what she had learned in nurse-midwifery school, and what she knew about Sally's progress, the nurse-midwife agreed to allow the patient to rest. Twenty minutes later, through intermittent grunting, the patient said she felt as though she needed to have a bowel movement. Without repeating the pelvic exam, the nurse-midwife suggested that Sally do what it felt like she needed to do.

(continued)

CASE STUDY *(continued)*

The nurse-midwife also agreed to Sally's request that she be allowed to stand at the bedside to push because of the severe back pain she had while lying flat on her back. The external fetal monitor was removed and the nurse used intermittent monitoring to evaluate fetal status. Everyone in the room sat quietly while Sally pushed, moving from her hands and knees, to squatting, to standing. Every time the nurse-midwife saw the fetal head move at the introitus, she praised Sally for the hard work she was doing, reminded Sally that her body knew what to do, and encouraged her to keep listening to the cues her body was sending. Forty minutes later, on her hands and knees, Sally gave birth to an 8-lb. baby girl over an intact perineum; Apgar scores were 8 and 9 at 1 and 5 minutes, respectively.

Exemplar of Best Practice

In this case, the practices used by the nurse-midwife supported the physiologic process that was occurring during second stage. The patient was encouraged to participate in decisions regarding her care, and the nurse-midwife provided support and encouragement while the patient pushed in response to the sensations she experienced rather than in response to direction from the nurse-midwife about when and how to push. Using the evidence to guide practice led to optimal outcomes for both the mother and baby.

REFERENCES

Aderhold, K. J., & Roberts, J. E. (1991). Phases of second stage labor. *Journal of Nurse-Midwifery*, *36*(5), 267–275.

Albers, L. L. (1999). The duration of labor in healthy women. *Journal of Perinatology*, *19*(2), 114–119.

Albers, L. L., Schiff, M., & Gorwoda, J. G. (1996). The length of active labor in normal pregnancies. *Obstetrics and Gynecology*, *87*(3), 355–359.

Albers, L. L., Sedler, K. D., Bedrick, E. J., Teaf, D., & Peralta, P. (2005). Midwifery care measures in the second stage of labor and reduction of genital tract trauma at birth: A randomized trial. *Journal of Midwifery & Women's Health*, *50*(5), 365–372.

Albers, L. L., Sedler, K. D., Bedrick, E. J., Teaf, D., & Peralta, P. (2006). Factors related to genital tract trauma in normal spontaneous vaginal births. *Birth*, *33*(2), 94–100.

Allen, V. M., Baskett, T. F., O'Connell, C. M., McKeen, D., & Allen, A. C. (2009). Maternal and perinatal outcomes with increasing duration of the second stage of labor. *Obstetrics and Gynecology*, *113*(6), 1248–1258.

American College of Nurse-Midwives. (2011). *Fact sheet: Essential facts about midwives*. Retrieved from http://www.midwife.org/ACNM/files/ccLibraryFiles/Filename/000000001674/Essential%20Facts%20about%20Midwives%202012.pdf

American College of Obstetricians and Gynecologists. (2003). ACOG practice bulletin number 49, December, 2003: Dystocia and augmentation of labor. *Obstetrics and Gynecology*, *102*(6), 1445–1454.

Ashford, J. I. (1988). *Mothers and midwives: A history of traditional childbirth*. Mendocino, CA: Author.

Badiou, W., Bousquet, P. J, Prat-Pradal, D., Monroziès, X., Mares, P., & de Tayrac, R. (2010). Short vs long second stage of labour: Is there a difference in terms of postpartum anal incontinence? *European Journal of Obstetrics, Gynecology, and Reproductive Biology*,*152*(2), 168–171.

Barnett, M. M., & Humenick, S. S. (1982). Infant outcome in relation to second stage labor pushing method. *Birth*, *9*(4), 221–229.

Beynon, C. L. (1957). The normal second stage of labour: A plea for reform in its conduct. *The Journal of Obstetrics and Gynaecology of the British Empire*, *64*(6), 815–820.

Bloom, S. L., Casey, B. M., Schaffer, J. I., McIntire, D. D., & Leveno, K. J. (2006). A randomized trial of coached versus uncoached maternal pushing during the second stage of labor. *American Journal of Obstetrics and Gynecology*, *194*(1), 10–13.

Bowers, B. B. (2002). Mothers' experiences of labor support: Exploration of qualitative research. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *31*(6), 742–752.

Brancato, R. M., Church, S., & Stone, P. W. (2008). A meta-analysis of passive descent versus immediate pushing in nulliparous women with epidural analgesia in the second stage of labor. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *37*(1), 4–12.

Caldeyro-Barcia, R., Giussi, G., Storch, E., Poseiro, J. J., Lafaurie, N., Kettenhuber, K., & Ballejo, G. (1981). The bearing-down efforts and their effects on fetal heart rate, oxygenation and acid base balance. *Journal of Perinatal Medicine*, *9*(Suppl. 1), 63–67.

Cohen, W. R. (1977). Influence of the duration of second stage labor on perinatal outcome and puerperal morbidity. *Obstetrics and Gynecology*, *49*(3), 266–269.

Cohen, W. R. (1984). Steering patients through the second stage of labor. *Contemporary OB/GYN*, *22*(1), 122–139.

Current Nursing. (2011). *Change theory: Kurt Lewin*. Retrieved from http://currentnursing.com/nursing_theory/change_theory.html

Declercq, E. R., & Chalmers, B. (2008). Mothers' reports of their maternity experiences in the USA and Canada. *Journal of Reproductive and Infant Psychology*, *26*(4), 295–308.

Declercq, E. R., Sakala, C., Corry, M. P., & Applebaum, S. (2007). Listening to mothers II: Report of the second national US survey of women's childbearing experiences. *Journal of Perinatal Education*, *16*(4), 9–14. doi:10.1624/105812407X244769

Fitzpatrick, M., Harkin, R., McQuillan, K., O'Brien, C., O'Connell, P. R., & O'Herlihy, C. (2002). A randomised clinical trial comparing the effects of delayed versus immediate pushing with epidural analgesia on mode of delivery and faecal continence. *British Journal of Obstetrics and Gynaecology*, *109*(12), 1359–1365.

Fraser, W. D., Marcoux, S., Krauss, I., Douglas, J., Goulet, C., & Boulvain, M. (2000). Multicenter, randomized, controlled trial of delayed pushing for nulliparous women in the second stage of labor with continuous epidural analgesia. The PEOPLE (Pushing Early or Pushing Late with Epidural) Study Group. *American Journal of Obstetrics and Gynecology*, *182*(5), 1165–1172.

Friedman, E. (1954). The graphic analysis of labor. *American Journal of Obstetrics and Gynecology*, *68*(6), 1568–1575.

Gillesby, E., Burns, S., Dempsey, A., Kirby, S., Mogensen, K., Naylor, K., . . . Whelan, B. (2010). Comparison of delayed versus immediate pushing during second stage of labor for nulliparous women with epidural anesthesia. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *39*(6), 635–644. doi:10.1111/j.1552-6909.2010.01195.x

Gupta, J. K., Hofmeyr, G. J., & Smyth, R. M. (2009). Position in the second stage of labour for women without epidural anaesthesia. *Cochrane Database of Systematic Reviews*, (1), CD002006. doi:10.1002/14651858.CD002006.pub2

Hansen, S. L., Clark, S. L., & Foster, J. C. (2002). Active pushing versus passive fetal descent in the second stage of labor: A randomized controlled trial. *Obstetrics and Gynecology*, *99*(1), 29–34.

Hanson, L. (1998). Second-stage positioning in nurse-midwifery practices. Part 1: Position use and preferences. *The Journal of Nurse-Midwifery*, *43*(5), 320–325.

Hanson, L. (2006). Pushing for change. *The Journal of Perinatal & Neonatal Nursing*, *20*(4), 282–284.

Hodnett, E. D. (2002). Pain and women's satisfaction with the experience of childbirth: A systematic review. *American Journal of Obstetrics and Gynecology*, *186*(Suppl. 5), S160–S172.

Kashanian, M., Javidi, F., & Haghighi, M. M. (2010). Effect of continuous support during labor on duration of labor and rate of cesarean delivery. *International Journal of Gynaecology and Obstetrics*, *109*(3), 198–200.

Kelly, M., Johnson, E., Lee, V., Massey, L., Purser, D., Ring, K., . . . Wood, D. (2010). Delayed versus immediate pushing in second stage of labor. *MCN. The American Journal of Maternal Child Nursing*, *35*(2), 81–88.

Kennedy, H. P. (2000). A model of exemplary midwifery practice: Results of a Delphi study. *Journal of Midwifery and Women's Health*, *45*(1), 4–19.

Kennedy, H. P., & Shannon, M. T. (2004). Keeping birth normal: Research findings on midwifery care during childbirth. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *33*(5), 554–560.

Kibuka, M., Thornton, J. G., & Kingswood, C. J. (2009). Position in the second stage of labour for women with epidural anaesthesia (Protocol). *Cochrane Database of Systematic Reviews*, (4), CD008070. doi:10.1002/14651858.CD008070

Kilpatrick, S. J., & Laros, R. K., Jr. (1989). Characteristics of normal labor. *Obstetrics and Gynecology*, *74*(1), 85–87.

Lai, M. L., Lin, K. C., Li, H. Y., Shey, K. S., & Gau, M. L. (2009). Effects of delayed pushing during the second stage of labor on postpartum fatigue and birth outcomes in nulliparous women. *The Journal of Nursing Research*, *17*(1), 62–72.

Lemos, A., Amorim, M. M., Dornelas de Andrade, A., de Souza, A. I., Cabral Filho, J. E., & Correia, J. B. (2011). Pushing/bearing down methods for the second stage of labour (Protocol). *Cochrane Database of Systematic Reviews*, (5), CD009124. doi:10.1002/14651858.CD009124

Le Ray, C., Audibert, F., Goffinet, F., & Fraser, W. (2009). When to stop pushing: Effects of duration of second-stage expulsion efforts on maternal and neonatal outcomes in nulliparous women with epidural analgesia. *American Journal of Obstetrics and Gynecology*, *201*(4), 361.e1–361.e7.

Liao, J. B., Buhimschi, C. S., & Norwitz, E. R. (2005). Normal labor: Mechanism and duration. *Obstetrics and Gynecology Clinics of North America*, *32*(2), 145–164.

Lu, M. C., Muthengi, E., Wakeel, F., Fridman, M., Korst, L. M., & Gregory, K. D. (2009). Prolonged second stage of labor and postpartum hemorrhage. *Journal of Maternal-Fetal & Neonatal Medicine*, *22*(3), 227–232.

Maresh, M., Choong, K. H., & Beard, R. W. (1983). Delayed pushing with lumbar epidural analgesia in labour. *British Journal of Obstetrics and Gynaecology*, *90*(7), 623–627.

Mayberry, L. J., & Strange, L. B. (1997). Strategies for designing a research utilization project with labor and delivery nurses. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *26*(6), 701–708.

McCartney, P. R. (1998). Caring for women with epidurals using the "laboring down" technique. *MCN. The American Journal of Maternal Child Nursing*, *23*(5), 274.

McKay, S., Barrows, T., & Roberts, J. (1990). Women's views of second-stage labor as assessed by interviews and videotapes. *Birth*, *17*(4), 192–198.

Menticoglou, S. M., Manning, F., Harman, C., & Morrison, I. (1995). Perinatal outcome in relation to second-stage duration. *American Journal of Obstetrics and Gynecology*, *173*(Pt. 1), 906–912.

Myles, T. D., & Santolaya, J. (2003). Maternal and neonatal outcomes in patients with a prolonged second stage of labor. *Obstetrics and Gynecology*, *102*(1), 52–58.

Niesen, K. M., & Quirk, A. G. (1997). The process for initiating nursing practice changes in the intrapartum: Findings from a multisite research utilization project. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *26*(6), 709–717.

Osborne, K., & Hanson, L. (2012). Directive versus supportive approaches used by midwives when providing care during second stage labor. *Journal of Midwifery and Women's Health*, *57*(1), 3–11.

Paine, L. L., & Tinker, D. D. (1992). The effect of maternal bearing-down efforts on arterial umbilical cord pH and length of the second stage of labor. *Journal of Nurse-Midwifery*, *37*(1), 61–63.

Perry, L., & Porter, C. V. (1979). Pushing technique and the duration of the second stage of labor. *The West Virginia Medical Journal*, *75*(2), 32–34.

Piquard, F., Schaefer, A., Hsiung, R., Dellenbach, P., & Haberey, P. (1989). Are there two biological parts in the second stage of labor? *Acta Obstetricia et Gynecologica Scandinavica*, *68*(8), 713–718.

Prins, M., Boxem, J., Lucas, C., & Hutton, E. (2011). Effect of spontaneous pushing versus valsalva pushing in the second stage of labour on mother and fetus: A systematic review of randomised trials. *British Journal of Obstetrics and Gynaecology*, *118*(6), 662–670.

Read, G. D. (1947). An outline of the conduct of physiological labor. *American Journal of Obstetrics and Gynecology*, *54*(4), 702–710.

Roberts, C. L., Torvaldsen, S., Cameron, C. A., & Olive, E. (2004). Delayed versus early pushing in women with epidural analgesia: A systematic review and meta-analysis. *British Journal of Obstetrics and Gynaecology*, *111*(12), 1333–1340.

Roberts, J., & Hanson, L. (2007). Best practices in second stage labor care: Maternal bearing down and positioning. *Journal of Midwifery and Women's Health*, *52*(3), 238–245.

Roberts, J., & Woolley, D. (1996). A second look at the second stage of labor. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *25*(5), 415–423.

Roberts, J. E. (2003). A new understanding of the second stage of labor: Implications for nursing care. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *32*(6), 794–801.

Roberts, J. E., Goldstein, S. A., Gruener, J. S., Maggio, M., & Mendez-Bauer, C. (1987). A descriptive analysis of involuntary bearing-down efforts during the expulsive phase of labor. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *16*(1), 48–55.

Roberts, J. M., González, C. B., & Sampselle, C. (2007). Why do supportive birth attendants become directive of maternal bearing-down efforts in second-stage labor? *Journal of Midwifery and Women's Health*, *52*(2), 134–141.

Rouse, D. J., Weiner, S. J., Bloom, S. L., Varner, M. W., Spong, C. Y., Ramin, S. M., . . . Anderson, G. D. (2009). Second-stage labor duration in nulliparous women: Relationship to maternal and perinatal outcomes. *American Journal of Obstetrics and Gynecology*, *201*(4), 357.e1–357.e7.

Sampselle, C. M., & Hines, S. (1999). Spontaneous pushing during birth: Relationship to perineal outcomes. *Journal of Nurse-Midwifery*, *44*(1), 36–39.

Sampselle, C. M., Miller, J. M., Luecha, Y., Fischer, K., & Rosten, L. (2005). Provider support of spontaneous pushing during the second stage of labor. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *34*(6), 695–702.

Schaffer, J. I., Bloom, S. L., Casey, B. M., McIntire, D. D., Nihira, M. A., & Leveno, K. J. (2005). A randomized trial of the effects of coached vs uncoached maternal pushing during the second stage of labor on postpartum pelvic floor structure and function. *American Journal of Obstetrics and Gynecology*, *192*(5), 1692–1696.

Simkin, P. (1984). Active and physiologic management of second stage: A review and hypothesis. In S. Kitzinger & P. Simkin (Eds.), *Episiotomy and the second stage of labor* (pp. 7–21). Seattle, WA: Penny Press.

Simpson, K. R., & James, D. C. (2005). Effects of immediate versus delayed pushing during second-stage labor on fetal well-being: A randomized clinical trial. *Nursing Research*, *4*(3), 149–157.

Thomson, A. M. (1993). Pushing techniques in the second stage of labour. *Journal of Advanced Nursing*, *18*(2), 171–177.

Thomson, A. M. (1995). Maternal behaviour during spontaneous and directed pushing in the second stage of labour. *Journal of Advanced Nursing*, *22*(6), 1027–1034.

Vause, S., Congdon, H. M., & Thornton, J. G. (1998). Immediate and delayed pushing in the second stage of labour for nulliparous women with epidural analgesia: A randomised controlled trial. *British Journal of Obstetrics and Gynaecology*, *105*(2), 186–188.

Yeates, D. A., & Roberts, J. E. (1984). A comparison of two bearing-down techniques during the second stage of labor. *Journal of Nurse-Midwifery*, *29*(1), 3–11.

Yildirim, G., & Beji, N. K. (2008). Effects of pushing techniques in birth on mother and fetus: A randomized study. *Birth*, *35*(1), 25–30.

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Postpartum Hemorrhage: Best Practices in Management

15

Tia Andrighetti

POSTPARTUM HEMORRHAGE: A LEADING CAUSE OF MATERNAL MORBIDITY/MORTALITY

Postpartum hemorrhage (PPH) is one of the most frightening and life-threatening maternal complications that nurse-midwives encounter. It remains the leading cause of maternal mortality worldwide and the leading cause of morbidity in developed countries (Devine, 2009; Driessen et al., 2011). PPH occurs in 4% to 18% of births worldwide (Anderson & Etches, 2007; Devine, 2009; Oyelese & Ananth, 2010).

PPH occurs in 2.9% of all births in the United States, with the rate increasing to 27.5% between 1995 and 2004 (Bateman, Berman, Riley, & Leffert, 2010). Rates of PPH have been increasing internationally as well (Callaghan, Kuklina, & Berg, 2010; Lutomski, Morrison, Greene, & Lydon-Rochelle, 2011). PPH rates are difficult to calculate and may be underestimated due to inaccuracy in estimating blood loss (EBL) following a birth as well as the lack of a universal clinical definition (American College of Obstetricians and Gynecologists [ACOG], 2006; Brucker, 2001; Callaghan et al., 2010; Devine, 2009; Knight et al., 2009; Oyelese & Ananth, 2010).

The concern about inaccuracy in EBL was raised by Prendiville, Harding, Elbourne, and Stirrat in 1988. The classic definition of PPH is a blood loss greater than 500 cc for a vaginal birth and greater than 1000 cc for a cesarean birth (ACOG, 2006; Rajan & Wing, 2010). These definitions have been questioned because 500 cc is considered the average blood loss in a vaginal birth and many women will not experience any deleterious effects of blood loss until the loss exceeds 1000 cc (Lu, Korst, Fridman, Muthengi, & Gregory, 2009). Some organizations define PPH as blood loss greater than 1000 cc regardless of route of birth (Lu et al., 2009). Another definition of PPH is a 10% decrease in hemoglobin or hematocrit or the need for blood transfusion (ACOG, 2006; Devine, 2009; Rajan & Wing, 2010). However, no universal definition has replaced the classic definition.

The morbidity associated with PPH impacts the woman and everyone who must compensate during her recovery. Maternal morbidities include fatigue, orthostatic hypotension, anemia, disseminated intravascular coagulation, renal failure,

acute respiratory failure, and infection. There are related health system impacts, including blood product usage, surgery, intensive care admission, and prolonged hospitalization (Anderson & Etches, 2007; Bateman et al., 2010; Carroli, Cuesta, Abalos, & Gülmezoglu, 2008; Devine, 2009; Lu et al., 2009; Zelop, 2011). In a mild case of PPH, even fatigue and hypotension can significantly impact a woman's ability to care for her newborn and herself. In a more severe case of PPH, the woman may be incapacitated or even die.

Delays in diagnosis and treatment of PPH are major issues impacting morbidity and mortality. Therefore, how health care providers are trained and drilled is essential (Devine, 2009; Driessen et al., 2011; World Health Organization [WHO], 2009). This chapter reviews risk factors associated with PPH, the evidence on prevention and management of PPH, and best practices for nurse-midwives in the prevention and the management of this life-threatening complication.

PPH: THE EVIDENCE

Risk Factors for PPH

Uterine atony is the etiology for more than 70% of PPH and, in many cases, atony can be anticipated (Bateman et al., 2010; Oyelese & Ananth, 2010). Bateman et al. identified atony as the etiology explaining the rise of PPH in the United States, whereas PPH due to coagulopathies and retained placenta have not increased. Causes of atony include

1. overdistention of the uterus due to macrosomia, multiple gestation, or polyhydramnios;
2. retained placenta or placental fragments;
3. previous history of PPH;
4. rapid or prolonged labor;
5. induction or augmentation of labor;
6. chorioamnionitis; and
7. uterine relaxing drugs.

(Bateman et al., 2010; Callaghan et al., 2010; Devine, 2009; Lu et al., 2009; Oyelese & Ananth, 2010; Zelop, 2011).

The second leading cause of PPH is genital tract trauma (Oyelese & Ananth, 2010). Risk factors for genital tract trauma and PPH include cesarean and instrument-assisted births (Devine, 2009; Oyelese & Ananth, 2010). Less frequent causes of PPH include coagulation defects, uterine inversion, placenta accreta, and placenta previa (Oyelese & Ananth, 2010). Although multiparity and increasing maternal age has historically been considered risk factors for PPH, not all studies agree (Carroli et al., 2008; Devine, 2009; Oyelese & Ananth, 2010).

Failure to use uterotonic agents during the third stage is considered a risk factor (Oyelese & Ananth, 2010). The International Postpartum Hemorrhage Collaborative Group calls for more studies on the impact of maternal obesity, increased duration of labor, and changes in the management of second and third stage of labor as causative factors (Knight et al., 2009).

Many patients who experience PPH have no identifiable risk factors (Callaghan et al., 2010; Devine, 2009). Bateman et al. (2010) found that only 38.8% of patients with PPH had identifiable risk factors prior to the event when maternal age and cesarean birth were excluded. Nurse-midwives need to be prepared to manage this complication at every birth. Through careful assessment, the nurse-midwife can determine the most likely etiology of PPH and then progress to less common causes, framing the actions needed to prevent or manage this complication.

Risk Assessment for PPH

Lu et al. (2009) conducted a retrospective chart analysis of 20,746 births in a California hospital between 1995 and 2004. The aim of the study was to identify risk factors associated with PPH in vaginal births as well as primary and repeat cesarean births. These authors were interested in identifying the women at risk in order to determine best practices for primary prevention and earlier diagnosis. The study found that "prolonged second stage, macrosomia with maternal diabetes, macrosomia without maternal diabetes, manual removal of the placenta and the use of magnesium sulfate" (p. 424) placed women having a vaginal birth at highest risk. Combining risk factors exponentially increased risk. The authors concluded that targeting specific populations is premature at this juncture because many women who experience PPH do not have identified preexisting risk factors. However, identification and management remain key strategies (Lu et al., 2009).

The PITHAGORE6 cluster-randomized controlled trial was conducted between December 2004 and December 2005 in 106 French maternity units (Deneux-Tharaux et al., 2010). Driessen et al. (2011) extrapolated data from this study ($n = 4550$), examining factors that escalated risk of severe PPH (defined as hemoglobin drop of 4 g/dl or greater). Primiparity, multiparity with a previous cesarean birth, previous PPH, cervical ripening, prolonged labor, episiotomy, and preventive uterotonic medications increased the risk of severe PPH. This study also examined prevention strategies during the intrapartal period because some of the risk factors for severe PPH resulted from management during labor and birth. Among the study sample, 51% of the women had at least one risk factor related to management during labor and birth. The authors concluded that decreasing these modifiable risk factors during labor and birth could potentially decrease the risk of severe PPH (Driessen et al., 2011).

In this study, episiotomy was related to more severe PPH. The authors conclude that, although episiotomy is not a cause of uterine atony, bleeding from various sites including the perineum increases the risk of severe PPH (Driessen et al., 2011). Prophylactic oxytocin also increased risk of severe PPH. The authors state this may be a confounder as women with more risk factors were receiving preventive medications. The authors hypothesized that administering oxytocin alone did not prevent a severe PPH because multiple medications are generally needed to prevent this complication. They opined that because prophylactic medications were used, surveillance may have been less and the bleeding not discovered until a severe PPH had occurred (Driessen et al., 2011). This study demonstrated that severe PPH secondary to uterine atony was affected by the management of the

labor and birth including place of birth and delayed management of postpartum bleeding (Driessen et al., 2011).

Prevention of PPH

Research has been done on active management of the third stage of labor (AMTSL) as a strategy to prevent PPH. According to a Cochrane review,

> Active management reduced the average risk of maternal primary haemorrhage (more than 1000ml; risk ratio [RR] 0.34, 95% confidence interval [CI] 0.14 to 0.87, three studies, 4636 women) and of maternal haemoglobin less than 9g/dl following birth (RR 0.50, 95% CI 0.30 to 0.83, two studies, 1572 women) for women irrespective of their risk of bleeding. (Begley, Gyte, Devane, McGuire, & Weeks, 2011, pp. 1–2.)

AMTSL, according to this Cochrane review, involves administering prophylactic uterotonic medication, early cord clamping, and traction to the cord. The authors recommend that all women should be given the option of active management but note that the procedure has some risks including increased cramping, increased maternal diastolic blood pressure, more use of pain medications, increased readmission to the hospital due to bleeding, and lower newborn birth weight as a result of lower blood volume with immediate cord clamping (Begley et al., 2011).

There is a growing body of evidence on the benefits of delayed cord clamping for the infant, including larger blood volume at birth, less neonatal anemia, higher volume of red blood cells to the organs, and facilitation of cardiopulmonary adaptation (McDonald, 2007; Soltani, 2008). A recent Cochrane systematic review on timing of cord clamping examined 11 studies ($N = 2989$), five of which also looked at PPH or severe PPH. There was no significant difference in PPH rates between the early and late cord clamping groups (McDonald & Middleton, 2009).

Two AMTSL management studies were conducted in the United Kingdom at the Bristol Maternity Hospital in 1983 and in 1988. In both studies, AMTSL was defined as administering a preventive uterotonic medication immediately after birth of the neonate's anterior shoulder, early cord clamping (within 30 seconds of birth), and applying traction to the umbilical cord to deliver the placenta as soon as it separated (Prendiville et al., 1988).

The 1983 study examined a treatment group (AMTSL intervention) in comparison to a control group (physiologic management only). Among the control group, the rate of PPH was 7.5% compared to 5.0% in the treatment group. The 1988 study ($N = 1695$) was a prospective randomized controlled study. It was modified at the midpoint of the study due to an increased in PPH rate among the control group (physiologic management only group): 16.5% among the control group experienced PPH compared to 3.8% among the treatment group. The study protocol was altered to accommodate women who showed a need for one treatment option over another, and additional exclusion criteria were added. The trial was terminated prematurely because AMTSL was clearly identified as efficacious in preventing PPH (17.9% among the control group compared to 5.9% among the treatment group; Prendiville et al., 1988).

The 1988 study showed that length of the third stage of labor was longer in the physiologic group, resulting in the need for therapeutic rather than preventive oxytocin. Another key finding was that AMTSL was better than physiologic management in preventing PPH among women considered low risk for PPH. As a result of the Bristol landmark study, Prendiville et al. (1988) raised the following two questions:

- What is the most appropriate uterotonic?
- Are all of the aforementioned AMTSL interventions needed to obtain a decrease in PPH?

These questions are still being asked today.

The Hinchingbrooke randomized controlled trial (RCT) occurred 10 years after the Bristol trials (Rogers et al., 1998). This study site routinely practiced both active and expectant management in comparison to the Bristol Maternity Hospital that routinely practiced active management. This study examined women considered low risk for PPH ($n = 1512$). AMTSL was defined as "prophylactic oxytocic within 2 minutes of the baby's birth, immediate cutting and clamping of the cord and delivery of placenta by controlled cord traction or maternal effort" (Rogers et al., 1998, p. 693). PPH occurred in 6.8% of the AMTSL group and 16.5% of the expectant (physiologic) management group. This study recommended AMTSL but also noted that women's preferences of nonintervention in the third stage should be taken into account. As this study used a different definition of AMTSL than the Bristol study, comparing the studies was complicated.

Conversely, a recent systematic review by Dixon, Fullerton, Begley, Kennedy, and Guilliland (2011) suggests that low-risk women with physiologic labor and birth and expectant management are not at increased risk of PPH. In addition, a recent retrospective study conducted in New Zealand between 2004 and 2008 among women with midwifery-managed births in both home and hospital settings revealed that women with active management of the third stage had a relative risk of 2.76 (95% CI) of blood loss greater than 500 ml compared to women with physiological management. The authors of this study concluded that physiological care in the third stage of labor among healthy women is a best practice, regardless of birth setting (Dixon et al., 2011).

In clinical practice, there is considerable variation in the definition of AMTSL (Brucker, 2001; McDonald, 2007; Winter et al., 2007). The International Confederation of Midwives (ICM) and the International Federation of Gynecology and Obstetrics (FIGO) published a joint statement defining AMTSL as the administration of a uterotonic medication within 1 minute of birth, controlled cord traction, and immediate uterine massage following delivery of the placenta (ICM/FIGO, 2006). The timing of cord clamping is noticeably absent in this definition, and in 2011, the ICM recommended the practice of uterine massage to raise awareness of PPH among skilled birth attendants. The WHO (2009) defines AMTSL as performing the following actions: administration of a uterotonic soon after birth (time not specified), clamping the cord only after uterine contractions commence (usually noted at about 3 minutes), and controlled cord traction for placenta

delivery followed by fundal massage. Delayed cord clamping and uterine massage are recent recommendations by these organizations. Hofmeyr, Abdel-Aleem, and Abdel-Aleem (2010) state that there is limited evidence on the efficacy of uterine massage on preventing PPH, and these authors are currently examining the impact of delayed cord clamping.

Because AMTSL does not prevent all cases of PPH and most babies with early cord clamping survive, there are no clear-cut answers about risk-benefit to the mother or infant. Many authors, including those in the landmark studies as well as in various Cochrane reviews, call for each component of active management to be evaluated in RCTs, instead of in combination (Begley et al., 2011; Prendiville et al., 1988; Soltani, 2008).

Use of Uterotonic Medications for Prevention and Treatment of PPH

In the effort to prevent PPH, oxytocin is the drug most commonly used in active management (Anderson & Etches, 2007). A Cochrane review on preventive use of oxytocin found decreased maternal blood loss with oxytocin as compared with no uterotonic medications. When oxytocin was compared to ergot alkaloids (methylergonovine/*Methergine*), the only benefits of oxytocin were less need for manual removal of the placenta and fewer elevated blood pressures (Cotter, Ness, & Tolosa, 2010). According to Anderson and Etches, oxytocin used in the recommended doses has significantly fewer side effects compared to the ergot alkaloids. In another Cochrane review, Liabsuetrakul, Choobun, Peeyananjarassri, and Islam (2011) examined the use of ergot alkaloids in third-stage labor compared with no use of uterotonic medication. The authors found that ergot alkaloids reduced maternal blood loss while resulting in increased pain, vomiting, and higher blood pressure compared to the control group. An advantage of ergot alkaloids is the sustained uterine contraction that occurs with administration, but use is contraindicated in hypertensive women (Anderson & Etches, 2007; Rajan & Wing, 2010).

A Cochrane review on oxytocin agonists did not provide sufficient evidence for use in the prevention of PPH (Su, Chong, & Samuel, 2009). A Cochrane review on tranexamic acid based on two RCTs drew no conclusions about its use in prevention of PPH (Novikova & Hofmeyr, 2011). Using misoprostol (*Cytotec*) in conjunction with oxytocin is not effective according to a Cochrane review by Mousa and Alfirevic (2009).

Prostaglandins are commonly used in the treatment of PPH. The prostaglandin medication, carboprost tromethamine (Methergine), has the advantages of intramuscular administration and tolerance for repeat doses in controlling bleeding. However, there are significant side effects, such as nausea, vomiting, diarrhea, headache, hypertension, and flushing. Carboprost should be used cautiously if a woman has asthma or hypertension (Anderson & Etches, 2007). A Cochrane review indicated the possibility of prostaglandins being administered sublingually or orally while also noting these are preferable for AMTSL protocol (Gülmezoglu, Forna, Villar, & Hofmeyr, 2011).

Misoprostol (Cytotec) is a drug that is stable under a variety of temperatures, making it feasible for use in tropical areas. It is easy to administer, can be used by

less skilled attendants, and is relatively low in cost (Wangwe, Kidanto, Muganyizi, & van Roosmalen, 2009). Its side effects, including severe shivering and high temperatures, make it less desirable for preventive use compared to PPH treatment (McDonald, 2007). Rectal administration helps to lessen these side effects compared to oral administration (Rajan & Wing, 2010).

Although oxytocin continues to be the first-line drug intervention for prevention of PPH (Anderson & Etches, 2007), there is no proven uterotonic medication to prevent PPH. The choice of uterotonic medication still depends largely on the birth circumstances, provider preference, and organizational policy (McDonald, 2007).

BEST PRACTICES FOR NURSE-MIDWIVES

As noted from the aforementioned studies, risk assessment is helpful, but not all women with risk factors develop PPH and many without identifiable risk factors develop PPH, enhancing the need for prevention strategies (WHO, 2009). The best documented prevention strategy to date is AMTSL (Anderson & Etches, 2007; Begley et al., 2011). The original landmark studies on AMTSL recommended administering a preventive uterotonic medication before the birth of the placenta, performing early cord clamping, and applying traction to the cord for placental delivery. Three key world policy bodies—ICM, FIGO, and WHO—recommend the routine use of AMTSL but their definitions differ from the original recommendations (ICM, 2011; ICM/FIGO, 2006; WHO, 2009). Parity of AMTSL protocols is necessary for comparison of RCTs and for meta-analyses (Fahy et al., 2010). Comparative research on outcomes is not possible until there is a universal agreement on the definition and a uniform clinical protocol.

Implementing Evidence-Based Practices

Why do health care providers resist using evidence-based best practices? A study by Tan, Klein, Saxell, Shirkoohy, and Asrat (2008) examined differences in practice in the third stage of labor among obstetricians, family practice physicians, and midwives in British Columbia, Canada. They found that midwives were less likely than physicians to perform early cord clamping or to use preventive oxytocin and more likely to delay the use of oxytocin until after the birth of the infant. In this study, these practices persisted among midwives although close to 81% of the midwives agreed or strongly agreed that AMTSL was supported by research and was an evidence-based practice. Only 17% of the midwives believed that women at low risk for complications should have AMTSL routinely practiced at all their births.

The obstetricians in the study stated that they practiced AMTSL based on professional training, evidence-based research, and their own experience. Family physicians stated they practiced AMTSL based on their professional training and experience. Midwives stated their practice was based on evidence-based research followed by the women's preference. The midwives did not cite their professional training as a basis for practicing AMTSL. It is interesting to note that the midwives were the only group that spoke to the women's preferences. When

asked under what circumstances they did not practice AMTSL, 100% of the midwives answered their decision was framed by the women's preferences (Tan et al., 2008).

Although the majority of midwives were aware of the national guidelines recommending AMTSL, they decided not to practice AMTSL, stating that women's preferences were not considered in the guidelines. This study notes that there was no increased rate of either PPH or blood transfusions in midwife-attended births, begging the question about best practice for prevention of PPH (Tan et al., 2008). The authors of this study questioned the external validity of the Cochrane review as the Canadian guidelines on AMTSL implementation may not be applicable to midwifery practice in British Columbia. The authors further stated that midwifery practice in British Columbia is family-centered and community-based with many planned out-of-hospital births compared to the women studied in the landmark AMTSL trials. Although this study only obtained information from 47 Canadian midwives in British Columbia, the question of AMTSL as best practice has been raised by midwives in both the United States and Canada (Tan et al., 2008).

Protocols for Uterotonic Medications

Various protocols in the timing and route of administration of uterotonic medications are used. Many practitioners across the world administer uterotonic medications with the delivery of the anterior shoulder or right before the birth of the placenta, whereas in the United States and Canada, uterotonic medication is generally given after the birth of the placenta (ACOG, 2006; Brucker, 2001; McDonald, 2007). Administration of uterotonic medications after birth of the placenta is not an AMTSL protocol for prevention of PPH in any of the landmark trials.

Oxytocin by intramuscular or intravenous route should be given as first-line treatment (Anderson & Etches, 2007; Rajan & Wing, 2010). "Traditionally, oxytocin and ergot alkaloids are initially used, with prostaglandins employed as adjunctive therapy," (Rajan & Wing, 2010, p. 177). However, the evidence is not strong enough to determine this to be best practice. The ACOG (2006) states that using a uterotonic medication as first-line treatment is based on Level C evidence. Rajan and Wing advocate for this first-line treatment, stating there is no evidence suggesting a need to change this practice.

Early Cord Clamping

The aspect of AMTSL that is the most controversial is early cord clamping (Soltani, 2008). For many nurse-midwives, early cord clamping interferes with a noninterventional approach to an expected normal birth (Tan et al., 2008). How to reconcile this benefit of active management with the philosophy of normal birth is the question. Soltani advises considering the woman and her infant's risk factors before making a decision on using expectant or AMTSL management in early cord clamping. Nonetheless, many cases of PPH, even among low-risk women, cannot be anticipated prior to the event.

Uterine Massage

Initial AMTSL trials did not include uterine massage as part of the protocol. Currently, uterine massage is included in both the WHO and the ICM/FIGO definition of AMTSL. The Cochrane review on uterine massage is based on only one RCT of 200 women (Hofmeyr et al., 2010). This study showed less blood loss and less need for additional uterotonics in the group that had uterine massage immediately after placental expulsion. The conclusion of this review supports the ICM/FIGO statement on uterine massage post birth of the placenta but also notes that more evidence is needed.

When brisk bleeding and uterine atony persist into the fourth stage, the ACOG (2006) recommends fundal massage as an emergency measure to expel blood and clots. It is worth noting that this management strategy is in contrast to the ICM recommendation of performing routine uterine massage after delivery of the placenta as part of the AMTSL protocol (ICM, 2011). If brisk bleeding is noted but the uterus is firm, then another cause of the bleeding should be determined. It may be due to trauma, laceration, or a hematoma (Anderson & Etches, 2007). Finally, best practice includes evaluation and management of coagulation disorders if all these measures prove ineffective (Anderson & Etches, 2007).

During stabilization, intravenous access should be initiated, if not in place (Rajan & Wing, 2010). In a severe bleeding episode, bimanual compression of the uterus may diminish the amount of blood loss that occurs while awaiting uterotonic medications to work (Cunningham et al., 2010). Some authors recommend bimanual compression prior to trying uterotonic medications (Anderson & Etches, 2007; Rajan & Wing, 2010). Evidence on this strategy is lacking and the risk of infection should be considered. If the birth attendant is waiting on backup personnel and medications, bimanual compression may be indicated as an emergency measure.

Patient Education

Many women design birth plans, but the management of the afterbirth may be an afterthought. A best practice for nurse-midwives is to discuss the evidence around AMTSL intervention and expectant management during prenatal visits so the woman can participate in making an educated decision. As Drake, Hutchings, and Elias (2010) note, " . . . identifying and addressing practical concerns and constraints are critical to making evidence contextually relevant" (p. 2123). By having an open discussion with the woman, the nurse-midwife can be aware of the woman's thinking and wishes. This discussion should involve the evidence base for both expectant management and AMTSL, the evidence on uterotonic medications and delayed cord clamping, the potential detriments to both mother and infant with both AMTSL and expectant management, and the woman's anticipated risk factors. The woman needs to understand that PPH is not always preventable or anticipated. To facilitate trust with the woman and her family, there needs to be clear communication about the need for decision making in the moment while focusing on the normalcy of birth.

Clinical Competency in Expectant and Active Management

A best practice for nurse-midwives is to maintain clinical competency in both expectant management and AMTSL in order to support patient requests (Rogers et al., 1998) or in the case when uterotonic medication might not be available. Best practices include translating evidence into practice, honoring the woman's values, using available resources, and considering the context of the situation (Brownson, Fielding, & Maylahn, 2009).

Simulation is an excellent educational modality to maintain competency and practice skills that may not be used often but require rapid, competent response. Using simulation benefits critical thinking, application of knowledge, and refining clinical skills in a safe, nonthreatening environment (Horan, 2009; Ravert, 2008; Vash, Yunesian, Shariati, Keshvari, & Harirchi, 2007).

High-fidelity simulation includes environmental conditions that mimic a real-life scenario, thus encouraging the participant to experience realism in patient care (Maran & Glavin, 2003). A distinction should be made between high-fidelity simulators and high-fidelity simulations. High-fidelity simulators are mannequins with lifelike qualities. High-fidelity simulations are those that are the most realistic in their reenactment (Beaubien & Baker, 2004), taking the venue and props into account (Lathrop, Winningham, & VandeVusse, 2007). According to Beaubien and Baker, high-fidelity simulations promote understanding needed in complex clinical situations.

By mimicking a real-life scenario, situational stress and teamwork can be simulated, thus allowing the participant to enter into the complexity of a high stakes situation (Beaubien & Baker, 2004). High-fidelity simulation reenacts the stress that would be encountered during a real situation (Lathrop et al., 2007; Norris, 2008). Simulations can benefit the participant's ability to build on the experience when encountering a similar situation in the clinical setting.

Ideally, a simulation would be conducted with a full team, including nurses, technicians, nurse-midwives, and physicians. Full team simulation allows for evaluation of teamwork and reflection on areas of strength and weakness. It addresses teamwork and communication and essential elements in a crisis situation that frequently need improvement in actual situations (Jeffries, Bambini, Hensel, Moorman, & Washburn, 2009; The Joint Commission, 2004). Simulation for PPH is an ideal way to prepare and refine skills in emergent management.

USING THE EVIDENCE FOR BEST PRACTICE: EXEMPLAR

CASE STUDY 15.1

Simulation: Preparing for Postpartum Hemorrhage

Annie is a nurse-midwife at a Level 1 hospital. Since attending a conference on simulation, she has become interested in the use of this model to help prepare health care teams to react to obstetrical emergencies. Annie did a literature search

(continued)

CASE STUDY *(continued)*

and found that simulation training helps health care providers prepare for major emergencies by allowing the team to function and practice communication in a safe environment where no patient harm can be done. Process breakdown can be determined and analyzed resulting in optimal care.

Annie included all the major stakeholders in the decision making, obtaining buy-in. She approached the OB chair and proposed a postpartum hemorrhage (PPH) simulation inclusive of the full health care team. Annie then attended a medical staff meeting, explained the evidence base for simulation use, and obtained support. She approached the nursing administrators on the OB unit, proposing the simulation on each shift.

With funding from the hospital, Annie developed a high-fidelity PPH simulation scenario and obtained needed supplies: a video camera and standardized patients to play the part of the patient and her partner. After the standardized patients were briefed, Annie was ready to implement the simulation on the labor and birth unit.

Annie set up the supplies in the labor room, set up the video camera in the corner, recruited a nurse on the unit, and activated the emergency button on the wall. Annie played the role of the nurse-midwife. As the scenario unfolded, other nursing personnel, ancillary staff, and the consulting OB were summoned. Ultimately, the OR was prepared, anesthesia called, and the patient transferred to the OR for care.

Then all involved staff gathered for debriefing. A facilitator directed the discussion and recorded the comments. Everyone was allowed time to offer positive feedback, critique of the care, watch the video of the simulation, and identify areas in need of improvement. All departments were given written feedback.

Exemplar of Best Practice

Annie recognized that full-scale, collaborative, multidisciplinary simulations would enhance patient safety and her care as a nurse-midwife. She used principles of evidence-based care in researching the relevant literature, approaching the stakeholders, and obtaining buy-in from decision makers. Through her efforts, the OB unit was able to make necessary changes to communication and teamwork that would allow them to provide optimal care during PPH.

REFERENCES

American College of Obstetricians and Gynecologists. (2006). ACOG practice bulletin: Clinical management guidelines for obstetrician-gynecologists number 76, October 2006: Postpartum hemorrhage. *Obstetrics and Gynecology*, *108*(4), 1039–1047.

Anderson, J. M., & Etches, D. (2007). Prevention and management of postpartum hemorrhage. *American Family Physician*, *75*(6), 875–882.

Bateman, B. T., Berman, M. F., Riley, L. E., & Leffert, L. R. (2010). The epidemiology of postpartum hemorrhage in a large, nationwide sample of deliveries. *Anesthesia and Analgesia*, *110*(5), 1368–1373.

Beaubien, J. M., & Baker, D. P. (2004). The use of simulation for training teamwork skills in health care: How low can you go? *Quality & Safety in Health Care*, *13*(1), i51–i56.

Begley, C. M., Gyte, G. M., Devane, D., McGuire, W., & Weeks, A. (2011). Active versus expectant management for women in the third stage of labour. *Cochrane Database of Systematic Reviews*, (11), CD007412. doi:10.1002/14651858.CD007412.pub3

Brownson, R. C., Fielding, J. E., & Maylahn, C. M. (2009). Evidence-based public health: A fundamental concept for public health practice. *Annual Review of Public Health*, *30*, 175–201. doi:10.1146/annurev.publhealth.031308.100134

Brucker, M. C. (2001). Management of the third stage of labor: An evidenced-base approach. *Journal of Midwifery and Women's Health*, *46*(6), 381–392.

Callaghan, W. M., Kuklina, E. V., & Berg, C. J. (2010). Trends in postpartum hemorrhage: United States, 1994-2006. *American Journal of Obstetrics and Gynecology*, *202*(4), 353.e1–353.e6.

Carroli, G., Cuesta, C., Abalos, E., & Gülmezoglu, A. M. (2008). Epidemiology of postpartum haemorrhage: A systematic review. *Best Practice & Research. Clinical Obstetrics & Gynaecology*, *22*(6), 999–1012. doi:10.1016/j.bpobgyn.2008.08.004

Cotter, A. M., Ness, A., & Tolosa, J. E. (2010). Prophylactic oxytocin for the third stage of labour. *Cochrane Database of Systematic Reviews*. doi:10.1002/14651858.CD001808

Cunningham, F. G., Leveno, K. J., Bloom, S. L., Hauth, J. C., Rouse, D. J., & Spong, C. Y. (2010). *Williams obstetrics* (23rd ed.). New York, NY: McGraw-Hill.

Deneux-Tharaux, C., Dupont, C., Colin, C., Rabilloud, M., Touzet, S., Lansac, J., . . . Rudigoz, R. (2010). Multifaceted intervention to decrease the rate of severe postpartum haemorrhage: The PITHAGORE6 cluster-randomised controlled trial. *British Journal of Obstetrics and Gynaecology*, *117*(10), 1278–1287.

Devine, P. C. (2009). Obstetric hemorrhage. *Seminar in Perinatalogy*, *33*(2), 76–81.

Dixon, L., Fullerton, J. T., Begley, C., Kennedy, H. P., & Guilliland, K. (2011). Systematic review: The clinical effectiveness of physiological (expectant) management of the third stage of labor following a physiological labor and birth. *International Journal of Childbirth*, *1*(3), 179–195.

Dixon, L., Tracy, S., Guilliland, K., Fletcher, L., Hendry, C., & Pairman, S. (2011). Outcomes of physiological and active third stage labor amongst women in New Zealand. *Midwifery*. doi:10.1016/j.midw.2011.11.003

Drake, J. K., Hutchings, J. E., & Elias, C. J. (2010). Making evidence work for communities: The role of nongovernmental organizations in translating science to programs. *Journal of Women's Health*, *19*(11), 2119–2124.

Driessen, M., Bouvier-Colle, M. H., Dupont, C., Khoshnood, B., Rudigoz, R. C., & Deneux-Tharaux, C. (2011). Postpartum hemorrhage resulting from uterine atony after vaginal delivery: Factors associated with severity. *Obstetrics and Gynecology*, *117*(1), 21–31.

Fahy, K., Hastie, C., Bisits, A., Marsh, C., Smith, L., & Saxton, A. (2010). Holistic physiological care compared with active management of the third stage of labour for women at low risk of postpartum haemorrhage: A cohort study. *Women and Birth*, *23*(4), 146–152. doi:10.1016/j.wombi.2010.02.003

Gülmezoglu, A. M., Forna, F., Villar, J., & Hofmeyr, G. J. (2011). Prostaglandins for preventing postpartum haemorrhage. *Cochrane Database of Systematic Reviews*, (3), CD000494. doi:10.1002/14651858.CD000494.pub3

Hofmeyr, G. J., Abdel-Aleem, H., & Abdel-Aleem, M. A. (2010). Uterine massage for preventing postpartum haemorrhage. *Cochrane Database of Systematic Reviews*, (3), CD006431. doi:10.1002/14651858.CD006431.pub2

Horan, K. M. (2009). Using the human patient simulator to foster critical thinking in critical situations. *Nursing Education Perspectives*, *30*(1), 28–30.

International Confederation of Midwives. (2011). *Postpartum haemorrhage*. Retrieved from http://www.internationalmidwives.org/Projects/POPPHI/PostPartumHaemorrhage/tabid/339/Default.aspx

International Confederation of Midwives/International Federation of Gynaecology and Obstetrics. (2006). *Prevention and treatment of post-partum haemorrhage: New advances for low resource settings* (Joint Statement). Retrieved from http://www.sfog.se/PDF/PPH%20Statement%20FIGO07.pdf

Jeffries, P. R., Bambini, D., Hensel, D., Moorman, M., & Washburn, J. (2009). Constructing maternal-child learning experiences using clinical simulations. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *38*(5), 613–623.

The Joint Commission. (2004). *Sentinel event alert, issue number 30: Preventing infant death and injury during delivery*. Retrieved from http://www.jointcommission.org/sentinel_event_alert_issue_30_preventing_infant_death_and_injury_during_delivery/

Knight, M., Callaghan, W. M., Berg, C., Alexander, S., Bouvier-Colle, M. H., Ford, J. B., . . . Walker, J. (2009). Trends in postpartum hemorrhage in high resource countries: A review and recommendations from the International Postpartum Hemorrhage Collaborative Group. *BMC Pregnancy and Childbirth*, *9*, 55.

Lathrop, A., Winningham, B., & VandeVusse, L. (2007). Simulation-based learning for midwives: Background and pilot implementation. *Journal of Midwifery and Women's Health*, *52*(5), 492–498.

Liabsuetrakul, T., Choobun, T., Peeyananjarassri, K., & Islam, Q. M. (2011). Prophylactic use of ergot alkaloids in the third stage of labour. *Cochrane Database of Systematic Reviews*, (2), CD005456. doi:10.1002/14651858.CD005456.pub2

Lu, M. C., Korst, L. M., Fridman, M., Muthengi, E., & Gregory, K. D. (2009). Identifying women most likely to benefit from prevention strategies for postpartum hemorrhage. *Journal of Perinatology*, *29*(6), 422–427.

Lutomski, J. E., Morrison, J. J., Greene, R. A., & Lydon-Rochelle, M. T. (2011). Maternal morbidity during hospitalization for delivery. *Obstetrics and Gynecology*, *117*(3), 596–602.

Maran, N. J., & Glavin, R. J. (2003). Low-to high-fidelity simulation-a continuum of medical education? *Medical Education*, *37*(Suppl. 1), 22–28.

McDonald, S. (2007). Management of the third stage of labor. *Journal of Midwifery and Women's Health*, *52*(3), 254–261.

McDonald, S., & Middleton, P. (2009). Effect of timing of umbilical cord clamping of term infants on maternal and neonatal outcomes. *Cochrane Database of Systematic Reviews*, (2), CD004074. doi:10.1002/14651858.CD004074.pub2

Mousa, H. A., & Alfirevic, Z. (2009). Treatment for primary postpartum haemorrhage. *Cochrane Database of Systematic Reviews*, (1), CD003249. doi:10.1002/14651858.CD003249.pub2

Norris, G. (2008). The midwifery curriculum: Introducing obstetric emergency simulation. *British Journal of Midwifery*, *16*(4), 232–235.

Novikova, N., & Hofmeyr, G. J. (2011). Tranexamic acid for preventing postpartum haemorrhage. *Cochrane Database of Systematic Reviews*, (7), CD007872. doi:10.1002/14651858.CD007872.pub2

Oyelese, Y., & Ananth, C. V. (2010). Postpartum hemorrhage: Epidemiology, risk factors, and causes. *Clinical Obstetrics and Gynecology*, *53*(1), 147–156.

Prendiville, W. J., Harding, J. E., Elbourne, D. R., & Stirrat, G. M. (1988). The Bristol third stage trial: Active versus physiological management of third stage of labour. *British Medical Journal*, *297*(6659), 1295–1300.

Rajan, P. V., & Wing, D. A. (2010). Postpartum hemorrhage: Evidence-based medical interventions for prevention and treatment. *Clinical Obstetrics and Gynecology*, *53*(1), 165–181.

Ravert, P. (2008). Patient simulator sessions and critical thinking. *Journal of Nursing Education*, *47*(12), 557–562.

Rogers, J., Wood, J., McCandlish, R., Ayers, S., Truesdale, A., & Elbourne, D. (1998). Active versus expectant management of third stage of labour: The Hinchingbrooke randomised controlled trial. *Lancet*, *351*(9104), 693–699.

Soltani, H. (2008). Global implications of evidence 'biased' practice: Management of the third stage of labour. *Midwifery*, *24*(2), 138–142.

Su, L. L., Chong, Y. S., & Samuel, M. (2009). Oxytocin agonists for preventing postpartum haemorrhage. *Cochrane Database of Systematic Reviews*, (3), CD005457. doi:10.1002/14651858.CD005457.pub2

Tan, W. M., Klein, M. C., Saxell, L., Shirkoohy, S. E., & Asrat, G. (2008). How do physicians and midwives manage the third stage of labor? *Birth*, *35*(3), 220–229.

Vash, J. H., Yunesian, M., Shariati, M., Keshvari, A., & Harirchi, I. (2007). Virtual patients in undergraduate surgery education: A randomized controlled study. *ANZ Journal of Surgery*, *77*(1–2), 54–59.

Wangwe, P., Kidanto, H., Muganyizi, P., & van Roosmalen, J. (2009). Active management of third stage of labour: Misoprostil or oxytocin? *African Journal of Midwifery and Women's Health*, *3*(2), 57–61.

Winter, C., Macfarlane, A., Deneux-Tharaux, C., Zhang, W. H., Alexander, S., Brocklehurst, P., . . . Troeger, C. (2007). Variations in policies for management of the third stage of labour and the immediate management of postpartum hemorrhage in Europe. *BJOG: An International Journal of Obstetrics and Gynaecology*, *114*(7), 845–854.

World Health Organization. (2009). *WHO guidelines for the management of postpartum haemorrhage and retained placenta*. Paris, France: Author. Retrieved from http://whqlibdoc.who.int/publications/2009/9789241598514_eng.pdf

Zelop, C. M. (2011). Postpartum hemorrhage: Becoming more evidence-based. *Obstetrics and Gynecology*, *117*(1), 3–5.

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BEST PRACTICES IN MIDWIFERY

USING THE EVIDENCE TO IMPLEMENT CHANGE

BARBARA A. ANDERSON, DrPH, CNM, FACNM, FAAN
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EDITORS

"This book provides a well-rounded examination of the issues we face in using evidence to inform our everyday clinical decisions.…The authors…have gathered current evidence and created practice scenarios to help the reader visualize evidence-based practice in action. The [book's] content can be used to strengthen and, when needed, change practice."

—Holly Powell Kennedy

Maternal child health in the United States is in crisis. Outcomes for mothers and infants in America are the worst among wealthy nations. Yet throughout history, nurse-midwives have been—and remain—among the foremost advocates of using scientific evidence in clinical settings. This text advances this trend by providing a roadmap for nurse-midwives who strive to implement change through ushering unsubstantiated maternity care practices toward an evidence-based model. It is the only book about evidence-based practice for nurse-midwives that encompasses the most controversial areas of practice and suggests strategies for changing clinical environments. The text incorporates the foundations of midwifery and the midwifery model of care throughout.

Presenting the most current evidence-based research on the care of childbearing women, the book examines various levels of evidence for existing practices, describes the effects of these practices on maternal and infant outcomes, and describes evidence-based practices in the care of childbearing women. It addresses the use of electronic databases in examining evidence and identifying best practices, and considers how the current workforce environment affects the practice of nurse-midwifery. Each chapter reviews current literature, describes contemporary practices, and explores whether these practices are based on scientific evidence. Case studies support the examination of evidence and the identification of best practices.

KEY FEATURES:

- Focuses on scientific evidence as the framework for the practice of nurse-midwifery
- Addresses the most controversial areas of practice and suggests strategies for change
- Incorporates the hallmarks of midwifery and the midwifery model of care
- Examines practices that are in conflict with scientific evidence
- Provides guidance for practicing nurse-midwives in implementing best practices based upon scientific evidence

ISBN 978-0-8261-0885-2

SPRINGER PUBLISHING COMPANY
11 W. 42nd Street
New York, NY 10036-8002
www.springerpub.com