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
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Susan E. Stone, DNSc, CNM, FACNM
Editors
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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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 However, the first pillar has too often superseded the others—science can trump women’s knowledge of their bodies and/or clinicians’ confidence in their skills.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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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


Best Practices in Midwifery
Evidence-Based Maternity Care: The External Environment
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.
Evidence-Based Maternity Care: The External Environment

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
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).

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**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.
1. Evaluating and Using the Evidence

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 synthesize 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 evidence-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


