

WORKING WITH STAFF AROUND EVIDENCE-BASED PRACTICE: THE NEXT GENERATION OF RESEARCH UTILIZATION

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Evidence-based practice is becoming a ubiquitous term in health care, including nursing. Many staff members are feeling the need to become familiar with what evidence-based practice is and how to use it in their practice. At the same time, many resist the thought of learning something new, especially related to research. This article illustrates the parallels between research utilization activities, which have been occurring in nursing for at least three decades, and the more contemporary notion of evidence-based practice. Important skills that are common to both, including finding and grading the evidence, are discussed. A clinical example, using latex allergy response, is presented to highlight the process of incorporating research evidence into practice.

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In nursing and health care, the term *evidence-based practice* (EBP) is rapidly becoming a buzzword. The need to use research findings and best evidence have been deemed essential for maximizing the quality of patient outcomes and the cost-effectiveness of the care that is

delivered by nurses.¹ Although the imperative to move towards evidence-based nursing is there, many staff groan at the thought of learning something new related to research. The fact of the matter is, however, that nurses are well positioned to move toward EBP. Research utilization activities within nursing practice during the past 3 decades have given nurses useful knowledge and skills around reading, critiquing, synthesizing, and using research findings in practice. Expanding these skills to become comfortable in the realm of EBP can be done with relative ease.

Research has been a part of modern nursing practice since the days of Florence Nightingale. However, for many years there was confusion about the role and relationship of nurses to research. Recently, there has been acceptance of the notion that although not all nurses are researchers, all nurses should use research findings in their practice. Realization of this has led to the development of models of research utilization and incorporation of research utilization skills, such as the ability to read and critique research studies, into nursing curricula.² Within clinical settings, support from administration for research utilization activities and creation of a positive research culture have led to environments in which nurses are encouraged to question nursing activities.³ This healthy skepticism has allowed a transformation from the "We have always done it this way" way of thinking to "The research evidence supports this practice and we know it contributes to positive patient outcomes."

It is within this context that EBP in nursing can be considered the next generation of research utilization. Staff can be helped to under-

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Note: In late 1999, the Agency for Health Care Policy and Research (AHCPR) changed its name to the Agency for Healthcare Research and Quality, with a new acronym, AHRQ. The new name and acronym are used throughout this paper, but this note is included to inform readers who might not be aware of the name change.

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stand that developing skills in EBP will not require them to unlearn what they already know about research, nor will they be required to learn a whole new set of skills related to research. Instead, by expanding their current knowledge and taking a more interdisciplinary view of research and practice, staff nurses will find that EBP can become as comfortable and commonplace as research utilization already is within nursing practice.

□ DEFINITIONS

The first step in acquainting staff with EBP is to clarify definitions of key terms. Although research utilization and EBP are similar in many ways, they are not synonymous. Having with a basic understanding and agreement among definitions is a useful starting point.

Nursing Research: A classic definition of nursing research, from Burns and Grove,⁴ is, “A scientific process that validates and refines existing knowledge and generates new knowledge that directly and indirectly influences nursing practice.”

Research Utilization: The process by which knowledge generated from research becomes incorporated in clinical practice.⁵

Research Dissemination: The purposeful communication of research findings.⁶ Note that dissemination is the bridge between generation of research knowledge, through scientific investigation, and the use of that knowledge in practice by the nurse. Although dissemination alone does not guarantee that nurses will use research in practice, by making the research available, the barrier of inaccessibility is removed.

Evidence-Based Practice: The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.⁷ This definition can be expanded to *evidence-based health care*, in which the same strategies are applied to making decisions about the care of a population or a group of patients.

Several elements in the last definition can benefit from further elaboration. Evidence-based practice and health care both specify “conscientious, explicit, and judicious use” of current best evidence. Another way to state this is, “EBP is the integration of individual clinical expertise with the best available external clinical evidence from systematic research.”⁷ Within this definition, it is important to have a clear understanding of both individual clinical expertise and external clinical evidence. Expertise, according to Sackett and associates,⁷ is “proficiency and judgment that individual clinicians acquire through clinical practice and clinical experience.” They go on to note that increased expertise comes about through “effective and efficient diagnosis, thoughtful identification, and compassionate use of individual patients’ predicaments, rights, and preferences in making decisions about their care.”⁷

The latter part of this definition, external clinical evidence, is “clinically relevant research, often from the basic sciences of medicine, but especially from patient-centered research.”⁷ There has been a tremendous increase in the number of research studies conducted and published during the past three decades.⁸ In addition, there has been a sustained shift toward clinical research, which reflects the need within the profession for research to inform clinical practice.⁹ The increased volume as well as the increased relevance of studies in nursing provide the foundation for research-based, or evidence-based, practice. Nurses and other health care professionals need to be able to read, critique, and synthesize research findings and then use this knowledge, coupled with their clinical expertise, to make patient care decisions and ultimately intervene in ways that contribute to positive patient outcomes.

EBP makes clear the relationship between clinical expertise and external clinical evidence. This relationship has not been explicit in research utilization, which in retrospect was probably a mistake. EBP more clearly recognizes the contribution that the practitioner makes to the health care encounter by bringing

to bear his or her knowledge and skills acquired through formal education as well as clinical practice. Sackett and colleagues note that the practitioner must realize that both components are essential for EBP; neither alone is enough. Without clinical expertise, practice risks becoming “tyrannized by evidence” or, to put it even more bluntly, becoming “cookbook medicine.” Even so, evidence is necessary for a practitioner to remain current and up-to-date. “Current evidence both invalidates previously accepted tests and treatments and replaces them with new ones that are more powerful, more accurate, more efficacious and safer.”⁷ Conversely, there are times when excellent external evidence may be inapplicable or inappropriate for an individual patient. Careful use of both clinical expertise and external evidence in planning and delivering care for a patient or population leads to evidence-based practice and health care.

□ FINDING THE EVIDENCE

Because a key element of EBP is evidence, staff nurses need to develop expertise in locating the relevant data sources within the published literature. The explosion of health care information in recent years has made it imperative that nurses and other health care professionals have up-to-date skills for searching the literature. It is not acceptable to go to the library and page through the *Index Medicus* to retrieve a few relevant articles. Another article in this volume (see “Searching for Evidence in Perioperative Nursing,” by Martha R. Harris, pp 105-114) provides a thorough overview of the process of finding evidence, so just a few key points are highlighted here.

First, many different types of evidence are available in the published literature. McKibbon¹¹ describes the “publishing wedge” as a way of illustrating different levels of evidence. Level 1 includes ideas, editorials, letters, and opinion papers. Level 2 information includes case reports, which are anecdotal reports of a single or few cases that presented interesting or

unusual findings.* Levels 3 through 7 report findings from original research conducted in the laboratory (level 3), on animals (level 4) and humans (levels 5, 6, and 7). At each level, the research increases in complexity, scope, and rigor.¹¹ Not all clinical problems have been studied through level 7; thus, when reading a research report, it is important to determine the level of the study. In addition to these types of papers, the literature also includes systematic research reviews, which are syntheses of the available research evidence. Such a synthesis requires a comprehensive and systematic literature search with a rigorous process “to synthesize the findings into a coherent description of the state of the science.”⁹ Evidence-based clinical practice guidelines take the synthesis process one step further. These translations of research evidence put the synthesis in a format that makes them ready for use by clinicians in clinical practice settings. When searching for information on a clinical practice problem, systematic reviews and clinical practice guidelines can be very helpful, because someone else has already done the hard work of a comprehensive literature search and synthesis of the research evidence. Even so, it is important to critically evaluate the report or guideline to determine that the information is accurate and appropriate to the clinical situation at hand. Note that systematic reviews may go by many other names; McKibbon lists 17, including *meta-analysis*, *quantitative synthesis*, *integrative research review*, and *meta-regression*.¹¹

The second issue to consider is the source of the evidence and the methods that are available to direct the nurse to the source. Printed indexes, such as the *Index Medicus*, are quickly becoming outdated.¹² Instead, online or electronic (ie, CD-ROM) sources of literature citations such as MEDLINE should be used. There are a number of different bibliographic databases, including MEDLINE from the National

*Every researcher has a favorite case study that stands out in his or her memory. Ours is the report of “Disco Digit,” published in the *New England Journal of Medicine* in 1979.¹⁰

Library of Medicine, CINAHL, PsychINFO, and EMBASE.^{11,13} These were designed to provide broad coverage of all areas of health care. Although there is some overlap among these databases, they also have unique collections; thus, it is important to use several for literature searching and not rely on just one.

Other useful resources are collections of clinical practice guidelines, many of which can be found online. The Agency for Healthcare Research and Quality (AHRQ) is one such resource (www.ahrq.gov); another is the National Guideline Clearinghouse (www.ngc.gov). Articles and papers are also being published online. It is important to realize that some articles on the Internet are similar to those that are found in traditional journals, but there are also reports and articles that are invalid, not peer reviewed, and may be written by people with uncertain (or unknown) credentials. One must critically evaluate all information that is found on the Internet. Although many evaluation criteria exist,¹⁴ a simple mnemonic that can be used is: "Are you PLEASED with the site?"

- **P** purpose of the site: clearly explained, appropriate content for the purpose
- **L** links: working links, reliable, linking to reputable sources
- **E** editorial: site content. Assess accuracy, currency, and content
- **A** author: who is the author? Appropriate for the content, with credentials identified and relevant
- **S** site: navigation easy and fast, pages download quickly, judicious use of graphics
- **E** ethical: contact information for author is included, full disclosure of purpose and objectives of the site
- **D** dates: information on when site was created and last updated, site has been updated within a reasonable period (6 months) for time-sensitive information.

Online journals are yet another source of clinical practice evidence. *The Online Journal of Knowledge Synthesis for Nursing*, published by Sigma Theta Tau International, and *Best Evidence*, produced by the American College of

Physicians, are 2 such resources that specialize in systematic reviews of the research literature. *The Online Journal of Knowledge Synthesis for Nursing* is a particularly useful resource for nurses, because it is the only nursing journal devoted to presenting synthesized research evidence for clinical application. The Cochrane Collection, which is discussed more fully in the paper by Harris (pp 105-114), is another useful resource.

□ GRADING THE EVIDENCE

Once a body of research evidence has been obtained, the next step is to help staff learn how to evaluate, or "grade," the evidence that is available to them. This is an area that has received quite a bit of attention in recent years. It is interesting to note some parallels between the development of research in medicine and nursing, which has led both disciplines to the need to develop models for the objective assessment of research evidence.

In medicine, for many years, the randomized clinical trial (RCT) was considered the "gold standard" of research evidence. Without an RCT, the evidence was considered questionable. This insistence on the RCT as the gold standard led to a homogeneous research tradition within the discipline. Even so, there are practices that have never been tested in a double-blind, experimental study, the model for the RCT. A very well-known example is the Papanicolaou (Pap) smear. This procedure was developed by George Papanicolaou in 1928 and promulgated through presentations at conferences and publications in the literature. Today, Pap smears are certainly a standard of care and are known to have led to the early detection and diagnosis of cervical malignancy.¹⁵ No one would suggest abandoning this practice, even though supporting evidence from an RCT is not available.

As clinicians were challenged to provide the evidence for their clinical practices, it became apparent that not every intervention had an RCT that demonstrated its efficacy, even though the practice under consideration was com-

monly accepted as a standard of care. In other words, the homogeneous body of research knowledge in medicine was found to be lacking. This realization led to the need to develop criteria for grading other types of evidence, either from disciplines other than medicine or using methods other than a true experiment. By grading the evidence, it became possible to objectively incorporate other sources and types of clinical information into practice. This, in turn, more fully acknowledged the reality of patient-centered research wherein it must be understood that many variables cannot be as tightly controlled as they could be in a laboratory setting. However, many clinical problems cannot be studied in a laboratory setting and must be investigated in a natural environment.

Nursing, in contrast, has a heterogeneous research tradition. Many factors have contributed to this, including the history of the development of research within nursing and the fact that many nurse researchers have been educated in disciplines outside of nursing. These disciplines have multiple research traditions; consider ethnography within sociology; participant observation in anthropology; and the experimental tradition in psychology. All of these have contributed to the diversity of research in nursing. Although this diversity has been helpful for nursing science, allowing a wide variety of questions to be investigated, at the same time, it has posed challenges for the profession

in our quest to develop a body of scientifically validated and tested knowledge.

Even though there have been wide differences within the development of research in nursing and medicine, we have arrived at a surprisingly similar end point with the need to develop criteria to grade the research evidence and assess findings for their usefulness in practice. The model of this development and outcome is illustrated in Figure 1.

Although a number of schema for rating evidence have been put forth, a model that has become widespread and commonly accepted was developed by AHRQ. In 1989, AHRQ convened an interdisciplinary panel charged with developing a clinical practice guideline on the management of acute pain. This group began their work by developing a model for rating the evidence that was refined over the next 5 years as similar panels were established to develop guidelines on a variety of clinical topics, from management of acute otitis media to smoking cessation.

The AHRQ guideline rates (1) the type of evidence and (2) the strength and consistency of evidence. Table 1 illustrates the guideline from "Management of Cancer Pain."¹⁶ *Type of evidence* refers to the method and number of studies, and whether the studies included the specific population under question, or another type of patient population. A meta-analysis of multiple, well-designed, and well-controlled studies of patients with cancer would receive

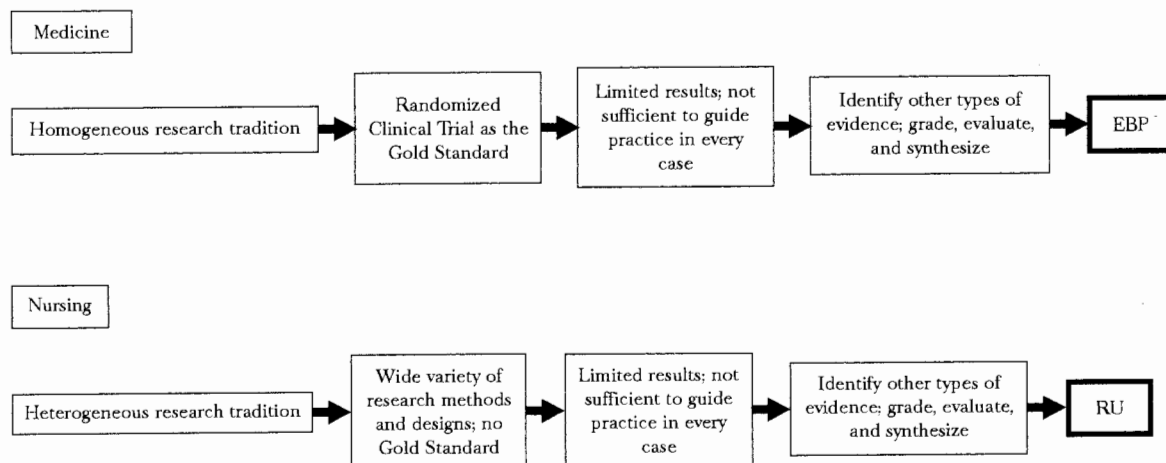


Figure 1. Similarities and differences in research development activities within medicine and nursing.

TABLE 1. EVIDENCE RATING SCHEMA FROM MANAGEMENT OF CANCER PAIN, AHRQ

<p><i>Type of evidence</i></p> <ul style="list-style-type: none"> I. Meta-analysis of multiple, well-designed controlled studies <ul style="list-style-type: none"> A. Studies of patients with cancer B. Studies of other clinical populations II. At least 1 well-designed experimental study <ul style="list-style-type: none"> A. Studies of patients with cancer B. Studies of other clinical populations III. Well-designed, quasiexperimental studies such as nonrandomized controlled, single-group pre-post, cohort, time series, or matched case-controlled studies <ul style="list-style-type: none"> A. Studies of patients with cancer B. Studies of other clinical populations IV. Well-designed nonexperimental studies, such as comparative and correlational descriptive and case studies <ul style="list-style-type: none"> A. Studies of patients with cancer B. Studies of other clinical populations V. Case reports and clinical examples <ul style="list-style-type: none"> A. Studies of patients with cancer B. Studies of other clinical populations <p><i>Strength and consistency of evidence</i></p> <ul style="list-style-type: none"> A. There is evidence of type I or consistent findings from multiple studies of types II, III, or IV B. There is evidence of types II, III, or IV, and findings are generally consistent C. There is evidence of types II, III, or IV, but findings are inconsistent D. There is little or no evidence, or there is type V evidence only <p>From Management of Cancer Pain. <i>Clinical Practice Guideline Number 9 AHCPR Publication No. 94-0592</i>. Rockville, MD: Agency for Health Care Policy and Research, Public Health Service, US Department of Health and Human Services; March 1994 [cited online 7 March 2000].</p>

the highest rating (I-A), whereas case reports on noncancer patients are rated much lower (V-B). The second component is the *strength and consistency* of the evidence, with type I studies again being the strongest in terms of overall scientific evidence. Even so, this schema does allow for the incorporation of anecdotal evidence from case studies or clinical reports but the rating provides for the proper “grain of salt” to be considered in their evaluation. In other words, the scientific contribution that a case study makes is far less than the contribution made by a body of evidence from original research, but both ends of the continuum are reflected in the scale.

As clinicians evaluate the evidence available to them, they can begin to establish whether a body of knowledge exists around a particular clinical problem. Given that EBP activities are often driven by the need to make a clinical practice change, this becomes an important issue to consider. Is there sufficient evidence to support a change? If the evidence is lacking or

weak, but the issue is still of concern, the next item to consider is the benefit-to-risk ratio and the feasibility of making this practice change.

□ PROCESS OF PRACTICE CHANGE

At this point, the key elements for EBP are all in place. Staff members have the requisite knowledge and clinical expertise that they bring to bear in patient encounters. At the same time, they have the resources available to them to find current clinical evidence and the skills necessary to evaluate the evidence at hand. How then do these disparate pieces come together to become EBP?

A model is a useful framework to think about the different elements. Rosswurm and Larrabee published “A Model for Change to Evidence-Based Practice,”⁸ which has clinical utility. The steps in this model are: (1) assess a need for change; (2) link problem interventions and out-

comes; (3) synthesize best evidence; (4) design practice change; (5) implement and evaluate the change in practice; and (6) integrate and maintain the change in practice.

In this model, the initial impetus comes from a clinical practice problem. This problem may come from many sources, such as patient complaints, negative patient outcomes, quality improvement data, or new research findings. Titler and colleagues¹⁷ describe “knowledge focused triggers” and “problem focused triggers.” The former include sources such as standards and practice guidelines, recent research publications, and presentations at conferences, and the latter include clinical problems repeatedly encountered in practice, risk management and quality improvement data, and total quality management programs. Whatever the source, the problem forces the clinician to begin to question the processes and outcomes surrounding the issue and to consider whether a practice change is needed.

Nurses and other caregivers occasionally may need prompts to help identify problems. For example, asking questions such as “Who are our most challenging patients?” or “Why are we seeing an increased incidence of skin breakdown?” may help staff recognize the need for evaluating clinical procedures or problems. Posting recent research articles in the break room may begin a discussion about whether the most recent research is guiding practice. For example, each month the *AORN Journal* publishes critiques of research articles related to perioperative practice. Making copies of these types of articles readily available and providing a supportive environment with easy access to the health literature and the Internet can support an EBP model. Staff members need to share responsibility in this process and must be provided time and recognition for their research-related efforts. Clinical environments must support nurses who value EBP and are willing to raise questions about and challenge current practice standards.

If the environment is supportive, then nurses can work toward carefully clarifying the ques-

tion. This is important because the underlying, true problem may be quite different from the initial impetus. As an example, consider the issue of home laundry of scrubs in the operating room. When this issue is first brought up, many immediately think of infection; that is, if staff members begin laundering scrubs at home, will there be a concurrent increase in patient infections? But when the issue is explored more fully, it becomes apparent that the real issue is theft. Hospital scrubs often seem to “grow legs and walk out” of the hospital. The conventional reasoning is that if staff members are responsible for a limited number of scrub sets (and that responsibility includes home laundering), maybe the clothes will not have such a tendency to disappear. When the clinical practice issue is clarified in this way, it becomes apparent that a research investigation on the rate of patient infection would *not* provide the solution to the problem of laundry theft.

Once the question is clear and it is determined that research evidence is the appropriate source of information to address the issue, the next step is to retrieve the literature and evaluate the evidence that is obtained, as discussed previously. With literature in hand, staff are able to determine whether a body of research knowledge exists around the problem. In the best instance, an evidence-based clinical practice guideline has already been developed, providing an authoritative resource of research evidence on the problem. In the absence of such a guideline, there may still be systematic review of the literature or meta-analysis, which can be evaluated and translated into a clinical practice guideline. Thinking back to McKibbon’s publishing wedge, stronger evidence provides more guidance for clinical practice, but the opposite is also true: weaker evidence, such as that found in anecdotal reports and case studies, provides less support.¹¹ Whatever the results, clinicians need to carefully evaluate the evidence that has been retrieved. With such evidence in hand, it is possible to determine the proper course of action: clinical practice change, additional data collection around the problem,

or development of a research investigation are 3 possible steps that may be appropriate. Before deciding to conduct a research study, however, realize that in most cases, sufficient evidence does exist to develop and implement a clinical practice change to address the issue.⁹

Once the proper course of action has been determined, the final steps are to implement and evaluate the efficacy of a clinical practice change. Ongoing evaluation of the change is necessary, with modifications made based on the evaluative data. This sounds simple, but clinical practice changes are always complex endeavors, requiring involvement of key stakeholders, assessment of the practice environment, implementation on a pilot unit, evaluation of outcomes, and ongoing monitoring to maintain the change. Any number of articles and books are available on the change process. The articles by Titler et al and Rosswurm and Larrabee mentioned previously are good resources; *Diffusion of Innovations* by Rogers is also a classic.^{8,17,18}

□ **CLINICAL EXAMPLE: LATEX ALLERGY**

The following clinical example on latex allergy can be used to illustrate this process. Imagine that several staff members attend the AORN Congress, and while there, they hear several presentations on the problem of latex allergy response in staff and patients. They also see several product demonstrations on various non-latex products at the exhibits. They come back to work, eager to tell the department manager that the perioperative environment must become totally latex-free as soon as possible.

The first step is to clarify the problem. In this case, external data (from AORN Congress) have highlighted a potential practice issue. Staff and administration can begin to collect data from the internal environment to determine whether a problem exists. This process is facilitated if various stakeholders are included in the discussion. In the case of latex allergy, important

stakeholders may be located outside of the perioperative setting. Many in the hospital wear gloves and use equipment or supplies made with latex or are involved in the purchase and storage of supplies such as gloves and equipment. Through this discussion, the following is established: in this particular institution, there has not been an incident of a negative patient or staff member outcome related to latex; still, the issue is deemed to be of great enough risk that steps should be taken to render the environment latex-free.

The next step is to search the literature and obtain the most up-to-date information concerning latex allergy response. Helpful, pertinent references can be obtained by searching MEDLINE, CINAHL, and sources of clinical practice guidelines. It would be helpful for group members to examine research reviews, clinical practice guidelines, and recent research findings. This information can help the group focus on the target population, as well as the aims and objectives of their efforts. Reviewing the recent research findings would help the group understand that powder on gloves is a vehicle for sensitization and increases direct contact with aerosolized latex proteins with mucous membranes of the eyes and respiratory tract. The recent research also would identify the patients and staff members most at risk for a latex allergy response.^{19,20}

With this information in hand, the group might propose developing a powder-free environment for the entire health care facility and developing protocols for individuals at risk for a latex allergy response. Buy-in for these changes needs to occur at all levels. It is not too far-fetched to imagine that a surgeon might bring in powdered gloves from his office because he does not like the powder-free gloves. Or perhaps the nurses in the operating room hoard the remaining supplies of powdered gloves because they cannot bear the surgeons' complaints about the powder-free gloves. Everyone who may be affected by this change needs to clearly understand the rationale for adopting a

powder-free environment and their role in ensuring the safety of every patient and staff member. It would also be crucial to get the purchasing department involved and any other stakeholders who may be affected by a decision to implement a powder-free hospital. A change in practice can be defeated by just one staff member who is excluded from the process and decides to persist in using powdered latex gloves.

A search of the literature and related websites might provide helpful information about strategies to implement such a significant practice change. Information that might be helpful in the implementation process would include strategies to avoid exposure to latex in latex-sensitive patients and choosing appropriate equipment and supplies. Additional references might provide useful insights on working with staff members who resist change. A number of clinical practice guidelines describe the various types of allergic response treatment protocols for latex anaphylaxis. References such as these may be instrumental in establishing internal policies and procedures.

As with any EBP change, once the need for change in practice has been established, it is important to identify outcomes and interventions by integrating the best evidence. Once a practice change has been designed and implemented, it must be evaluated. If the interventions are effective and the outcomes positive, then the next step is to continually monitor the process and the expected and unexpected outcomes. Periodically reviewing any new evi-

dence will ensure that the practice change reflects the recent research findings.⁸

□ CONCLUSION

In summary, EBP and research utilization share the common goal of improving patient care with research results. EBP brings to clinical practice the best that the practitioner has to offer, that is, clinical expertise, coupled with the most current research evidence. By putting these 2 pieces together, staff are in a position to be confident in their interventions, knowing that what they do is based on expert judgment as well as verifiable external evidence. By being aware of what comprises the patient care encounter, staff are in a better position to understand patient outcomes as well as to assess their contribution to those outcomes.

EBP provides a framework for this to occur. To be effective, staff must know how to both collect research evidence, evaluate it for its applicability to practice, and implement clinical practice changes based on this information. Administration can provide support for EBP by providing the necessary resources to obtain the evidence and giving staff members the time to engage in discussions around clinical practice issues. Most importantly, administrators need to provide an environment that allows staff to question current clinical practices. A healthily skeptical environment, one in which it is acceptable to say "What evidence supports this practice?" is the context that allows EBP to flourish.

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