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Evidence-Based Practice Improvement
Merging 2 Paradigms

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This article presents a new model, Evidence-Based Practice Improvement, for improving patient care. The model merges 2 extant paradigms currently used for quality improvement initiatives—evidence-based practice and practice or performance improvement. The literature expounds on the virtues of each of these approaches, yet no authors have moved beyond parallel play between them. The merged model, Evidence-Based Practice Improvement, may provide a more effective and practical approach to reach our quality goals. **Key words:** *evidence-based practice*, *healthcare quality*, *performance improvement*, *quality improvement*

THE Visiting Nurse Service of New York (VNSNY) has been in the forefront of practice improvement (PI)* efforts in home care for several years, introducing and using tools such as the Institute for Healthcare Improvement Learning Collaborative format and Clinical Microsystems theory.[1] Pace University Lienhard School of Nursing has been a leader in integrating evidence-based practice (EBP) into nursing curricula and teaching EBP in the academic and practice settings. Thus, these 2 organizations were well suited to work together toward improving nursing practice and patient outcomes. An initial collaborative effort involved testing a model for developing EBP skills of selected frontline nursing staff as part of a joint research project among the VNSNY, Pace University Leinhard School of Nursing, and Arizona State University College of Nursing and Health Care Innovation (R. F. Levin, E. Fineout-Overholt, B. M. Melnyk, M. Barnes, M. Vetter, unpublished data, 2008).

As we reflected on our experience and outcomes from that study, it seemed that the PI and EBP paradigms could be more powerful in combination than each could be individually. Although EBP provides a systematic framework for defining and focusing a clinical question, gathering evidence, and evaluating the strength and relevance of that evidence in the practice setting, the idea and discipline of understanding levels of evidence and critiquing available evidence are useful in moving us away from dependence on anecdotal, flimsy "research" and "reinventing the wheel" (which often frames and drives improvement efforts in healthcare). The EBP model alone,

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*At the VNSNY, we use the term *practice improvement* because it is nursing practice that is in the forefront of improving healthcare outcomes for clients. "Performance improvement" is a term that emanates from a business perspective and focuses more on system changes. Also, in merging the 2 paradigms, we wanted to include the term *evidence-based practice* but add the importance of term *improvement*. Thus, to make our paradigm unique, we call it EBPI, with the "P" standing for practice rather than performance.

however, did not seem to provide a practical approach for how to *apply* the best evidence in the practice setting, disseminate best practices, and then sustain the evidence-based improvement in a large organization.

The PI model, on the other hand, provides a well-developed set of tools and strategies for implementing, evaluating, and spreading improvement work. There is significant emphasis on understanding critical work processes and systems that facilitate as well as those barriers that block healthcare improvements. The structure and discipline of the approach contribute to the likelihood that change will actually be introduced into the practice setting and foster an environment of ongoing testing, evaluation, and learning. Although PI involves reviewing the literature, convening "experts," and gathering "best practices" to inform proposed changes in practice, it does not emphasize or provide tools for systematically finding, evaluating, and critically appraising the best available evidence. In addition, the standards for literature review, expert input, and best practice exploration may vary widely. The strength of the PI model is in the actual design, testing, and implementation of practice improvement changes. Its focus on speedy implementation of small tests of change may alternatively be a deterrent to a thorough and comprehensive review and dissection of available evidence and how the evidence can inform the needed improvement at hand.

There were passionate proponents of each model in the VNSNY. When we looked at both, we were not willing to invest in building EBP skills among our workforce if they were not then able to apply their knowledge of best evidence to their work on a day-to-day basis. Conversely, investment in PI projects and building the capacity of our staff to use and apply the PI tools without the ability to access, understand, and apply the most current and available evidence would not result in the best return on our investment. Given the perceived "strengths and weaknesses" of each model, the path before us seemed conceptually clear, that is, to draw upon and leverage the assets of each. Titler et al[2] recommended incorporating EBP principles into existing organizational structures and processes to be most effective. Individuals who are knowledgeable about quality management and research, and who are experienced and knowledgeable about data acquisition and management, are in the best position to integrate EBP into an organization's practice improvement efforts.

We agreed, therefore, that our best course of action was to partner our research, quality management, and clinical education departments with academic partners—Pace University and the University of Pennsylvania—in an effort to combine and operationalize the best of both paradigms—Evidence-Based Practice Improvement (EBPI). By leveraging a functional infrastructure that was well recognized in the organization and familiar to both management and frontline staff, we anticipated success in integrating new principles for improving the quality of care. Existing PI methods in the organization targeted clinical directors and managers as the group that could facilitate practice improvement in each of our regional offices. We predicted that by also engaging and empowering this group with a level of EBPI expertise, they could more directly and effectively engage their staff in improvement efforts. The objective was to identify clinical practice problems that were relevant to field clinicians and important to the organization. By doing this, we hoped to generate a heightened level of enthusiasm, a characteristic of nurses who are supported by their organization in effecting improvements in patient care and clinical outcomes. The purpose of this article, therefore, is to describe the EBPI model and describe its usefulness in clinical practice.

THE EVOLUTION OF EBP

The term *evidence-based* was first used by medicine in 1992 by Gordon Gyatt, a Canadian physician from McMaster University, and the Evidence-Based Medicine Working Group.[3] Although the term *evidence-based*

medicine originated within the medical profession as a new approach to providing medical care, the essence of this paradigm, using research evidence as the *best* evidence to guide professional decision making, has spread to other professions both within and outside the healthcare arena. Singleton et al[4] discussed several examples from the disciplines of law, education, and management. In addition, Cullum et al[5] cited the use of the term *evidence-based* in professions such as physiotherapy and police science.

Regardless of the field or discipline in which this paradigm or model is applied, EBP has several conceptual and process components that cross disciplinary boundaries. Evidence-based practice is a framework for decision making that uses the *best available evidence* in conjunction with the *professional's expertise* and the client's, customer's, or consumer's *values and preferences* to guide problem-solving and judgments about how to best approach a situation to achieve desired outcomes.[6–8] The key to the EBP model is the systematic approach to finding the best available evidence to answer a focused question.

It is important to note that because EBP originated within medicine, the focus was on the physician-to-client relationship. In other words, the *focused clinical questions* had to do with an individual client problem that the physician needed to answer in order to formulate the most accurate diagnosis and institute the most appropriate treatment. When nursing adopted the "evidence-based" paradigm, there was shift from a one-on-one clinical question to a question about a group of patients experiencing a similar problem. An example of this difference is as follows:

- *For medicine originally*: What is the best treatment for my middle-aged, white, male patient who has essential hypertension? versus
- *For nursing or other discipline working in an organizational environment*: Does a specified mouth care protocol for patients on assisted ventilation reduce ventilator-acquired pneumonia?

This is a huge difference in approach and needs to be considered when trying to transfer a paradigm used in one discipline or system to another.

Because the majority of nursing care takes place within organizational systems, several models have evolved to facilitate the implementation of EBP in healthcare, mostly hospital, systems.[2,9,10] Although these models have been helpful in directing nursing to use evidence to guide practice and have attempted to promote a culture of scholarly practice in healthcare organizational systems, they have been parallel to rather than integrated with the performance or quality improvement models that emanate from a business perspective and are used by organizational systems across the board.

THE EVOLUTION OF PI

Drawing on strategies and techniques from industry, healthcare organizations have evolved in their approaches to managing quality.[11] As an example, in the era of "quality assurance," patient medical record audits were performed, consisting of retrospectively monitoring and evaluating aspects of care delivery such as effectiveness or utilization, against a set of minimal standards of practice. The results of such audits were reported and "correction plans" were developed to "ensure" that the quality of care would improve through receiving feedback about the gaps in meeting standards. The limitations of this type of approach include the narrow involvement of staff in the actual process of review, specifically related to identifying their clinical questions and drivers of their results, and in creating a meaningful plan for subsequent improvement. In addition, the delayed timing for the review of care and provision of feedback could make it difficult for staff to connect with the results, or more important, to make changes in their care in real or near real time, thus delaying improvement in the quality of care. Further limitations of this approach include inattention to establishing interrater reliability among auditors of data and lack of

a systematic process for collecting and using research evidence to support changes in practice.

Performance improvement evolved as a more systematic process that engages employees who provide day-to-day care in the process of making that care better. The approach incorporates features of several different quality movements. Using the PI process, teams meet regularly for the purpose of improving their performance and reaching desired outcomes through small tests of change. Through the review of a balanced scorecard of quality indicators—process, outcome, cost, and satisfaction—the team analyzes the drivers of their results, which may range from those related to the type of clinical care required within their patient population to those of patient expectations or variation in how a process of care is applied. The transparency of knowledge occurring in this type of interaction is a forum for learning as best practices or strengths of various team members emerge. The other outcome of meetings is the building of team commitment and consensus on an issue, area, or problem with leverage for improvement.

Once this takes place, team members begin the use of the core Plan, Do, Study, Act (PDSA) framework, starting with focusing their improvement and developing an accompanying plan, performing small "rapid cycle" tests of change, monitoring their results with data, and continuously learning as they study the results they achieve.[12] Each PDSA cycle produces learning that is used to build subsequent cycles in order to "ramp up" learning as the tests continuously occur. The successes achieved with performance, or practice improvement as the VNSNY calls it, include building a team's motivation and skill in improving performance as well as more rigorous learning.

EBPI LITERATURE REVIEW

Although there is a conceptual understanding of and appreciation for the EBP and PI approaches to achieving quality patient outcomes, there appears to be little literature to link the 2 frameworks together in a concrete way. To explore this supposition, we conducted a systematic review of the literature. Our guiding question was: Are there any models in the literature that merge the EBP and PI paradigms? We searched 3 electronic databases containing nursing and healthcare journals—ProQuest, CINAHL Plus (via EBSCOhost), and MEDLINE (via Ovid). Key words included Boolean variations of "evidence-based practice" (and) "quality improvement" (or) "practice improvement" (or) "performance improvement" (or) "improvement." Dates searched were limited between January 2003 and October 2008 because potential models we were hoping to locate had not surfaced in the older literature during any of the team members' previous research projects. Some older publications unexpectedly appeared in the MEDLINE search and were included in this review as applicable.[13–15] Journals were limited to peer-reviewed publications. Of the 1853 total article citations that were identified as being possible resources for linking EBP and PI, 42 were ultimately retrieved and reviewed. Of these, 13 were deemed relevant to our search question and are included here.

Evidence-based practice, previously known as research utilization and now sometimes referred to as evidence-based medicine or evidence-based healthcare when used within nursing and health professions, has become an internationally established framework to guide patient care.[14,16] While several specific models seek to describe how this *is* done, *should* be done, and *can* best be done through different levels in the continuum of care, the adoption, support, and evaluation of a given model differ fundamentally in how organizational infrastructures exist to support them.[17,18]

There has been an increasing body of literature that addresses the interrelatedness of quality improvement or PI and EBP.[13,19] Even though there are different steps and perspectives that ultimately drive each of these approaches to quality improvement, and in

many ways they are clearly distinct, their proximities and similarities in the literature seem to point to an escalating relationship between them that begs addressing. Moreover, when the 2 approaches to achieving positive patient outcomes exist alongside one another without sufficient and intentional interaction, the potential for decreased outcomes becomes more of a possibility.[20] To illustrate some possible ways that this can be affected, the literature reveals that some models are developing to try to explain and formalize the process. The chronic care model, as discussed by Benefield,[21] seeks to demonstrate a possible framework for implementing EBP through improvement work. In a related form, Lohr[22] described a model by which quality initiatives can try to assess and use the best available evidence they seek to utilize and guide their work. Another such model, *Read, Think, Do!*, was developed in response to the relationship of the EBP and PI paradigms, in which evidence is read, it is thought about within a specific organizational context, and then the practice change is implemented.[23]

While quality improvement initiatives access and use evidence, this process is not a definitive element of the strategy. Instead, improvement efforts tend to differentiate themselves by stating that they are working toward organizational alignment, encouraging group collaboration, and focusing on excellence.[24,25] Improvement frameworks are focused on spreading quality successes as quickly as possible using processes and rapid cycles of change.

Although these models seek to bridge the seeming gap between EBP and PI, they tend to view them as occurring in parallel and unrelated sequences rather than truly integrating them into a single model, what we have called the EBPI model. The EBPI terminology is not new. Evidence-based quality improvement[13] and even EBP improvement[26] have both been discussed, although the literature does not offer a model that unites EBP and PI together into a single, unified framework. By reflecting on our own experiences in attempting to implement practice change, we realized that implementing EBP or PI in isolation is not as effective as when they are both consciously combined and integrated into a single approach, advanced by an organizational culture that supports and embraces the merging of these 2 useful paradigms.

THE EBPI MODEL

Recently, Levin[27] shared that her experience of working with colleagues who are experts in and use a practice improvement approach to achieving desired patient outcomes has enlightened her view of the EBP model and process. She stated:

> My PI colleagues and I have spent many hours talking about how we could integrate these 2 models, taking the best of each one. The jargon of each model was initially what got in the way. When we finally threw out the jargon and focused on the processes we saw as helping us to achieve our patient care goals, we could begin to understand each other's worlds and see the best of each one.

Thus was born our EBPI model—the merging of the EBP and PI paradigms (Fig. 1) at the VNSNY. A description and example of each of the components of the EBPI model follows.

Describe the problem

One of the major issues with the formal explication of the EBP process is that it begins with a focused clinical question. Focusing a clinical question is not easy, and it is more difficult if we do not start with trying to understand the larger problem and its context. For example, Levin was working with nurses on a surgical unit in a major New York City hospital to study the feasibility of implementing EBP into the nursing service.[28] One of the first questions she asked one of the nurse EBP teams was to identify the problem on which they wanted to work. The nurse manager said that she wanted to work on patient satisfaction. Probing more deeply, Levin asked: "What about patient satisfaction is the problem?" The nurse manager then said that patients were complaining that there was a lot of noise on the unit. Further clarification of the

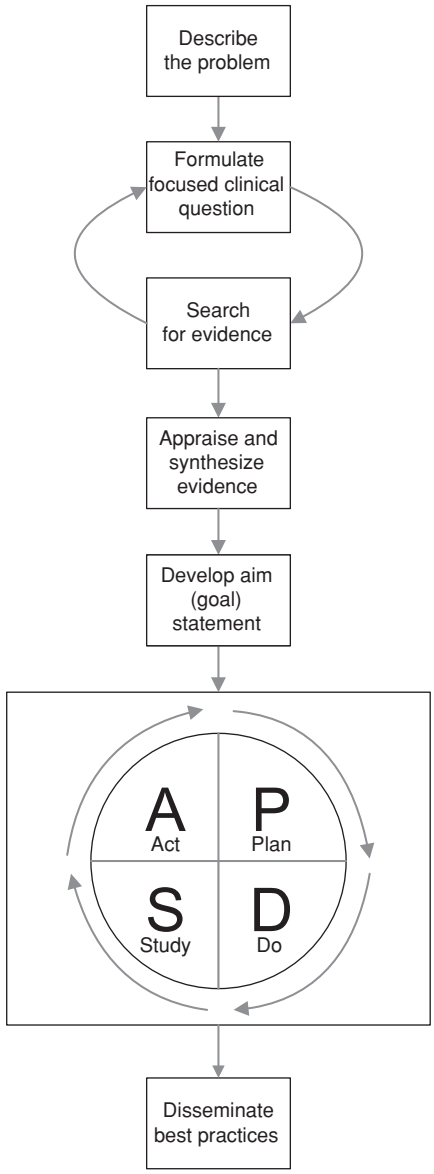

Figure 1. The Evidence-Based Practice Improvement model. Reprinted with permission from the Visiting Nurse Service of New York and Rona F. Levin. Copyright 2007 Visiting Nurse Service of New York and Rona F. Levin.

problem with validating evidence from anecdotal and hospital patient satisfaction data as well as relevant literature supported that noise was a factor in not only patient satisfaction but also other outcome variables such as fatigue and pain. Only after clarifying the problem by looking at both internal organizational data and background literature to frame the practice problem in a larger societal context could we focus a clinical question.[29] Framing a focused clinical question at the outset of the EBP process may serve the individual practitioner dealing with an individual patient well. As a beginning step within a large organizational system, however, we need to put the problem in a larger context, internally within the organizational context and externally within disciplinary literature, and validate that in fact a problem does exist at both levels. Therefore, the first step in the EBPI model is to describe the practice problem.

Formulate a focused clinical question

Once a general problem area is described and validated, we can formulate a clearer, more focused question to guide our improvement work. This component of the model comes from the EBP paradigm and uses the PICO format described initially by Sackett et al[30] and embellished by Melnyk and Fineout-Overholt[8]:

P = population of interest (includes age, gender, ethnicity, and/or other relevant characteristics)
I = Intervention or exposure to disease or prognostic factor A, or risk behavior
C = Comparison (may be no treatment/intervention, a placebo, no disease, prognostic factor B, or the absence of risk factor)
O = Outcome (eg, patient state, risk of disease, accuracy of diagnosis, the rate of occurrence of adverse outcome)

For example, then, the problem described earlier regarding noise, using this format, would be stated as: In a population of adult orthopedic postsurgical patients, what is the effect of a noise control intervention (compared with no intervention) on patient fatigue, pain, and satisfaction with care?

Search for evidence

Although many PI projects are based on "evidence," the search for and retrieval of this evidence is not always approached in the systematic way that is advocated in the EBP paradigm, which is to try to find the highest level of evidence first and then proceed methodically through the hierarchy of evidence to answer the focused question. Thus, a major principle from EBP that informs the PI paradigm is "Not all evidence is created equal."[31(p30)] That is, we can have more confidence in some types of evidence than in others. Just because the evidence you have may be a study or a clinical guideline published by an organization does not mean that it is the best evidence (ie, the most objective or the most trustworthy). We want to make sure that the evidence is the best we are able to obtain because it guides our clinical decisions for patient care. To judge the degree of confidence we may have in a particular study, guideline, or expert recommendation, healthcare professionals have developed rating scales to judge the level and quality of evidence.

Levels of evidence[8,32] refer to the type of evidence, for example, whether it is a summary of individual studies (integrative review or meta-analysis), a single study, or the opinion of an expert panel. Within each of these levels, the quality of the evidence may differ. Thus, a randomized controlled trial may be considered more or less valid (of higher or lower quality), depending on the critical appraisal of the study. Leveling schemes and quality ratings may differ according to the agency or organization or author. Under any circumstances, however, the leveling and determination of the quality of evidence are essential components of this model.

Appraise and synthesize evidence

Here again, this component is derived from the EBP paradigm. Many healthcare and other professionals are skilled in the critical appraisal of the evidence that they amass to support their performance or quality improvement project. Often, however, the review of evidence as a team, summarizing the evidence in a consistent and critical way, is lacking in the PI model. Much of the evidence that directs PI projects is predigested by a "third party" organization and used by agencies to initiate change. We have developed templates for project teams' use and a process for the critical review of all evidence that we use to support our performance or quality improvement efforts.

Develop an aim statement

This component of the model comes from the PI paradigm. An aim statement serves to direct attention to the specific outcomes desired and includes an operational goal and a measure of achievement. For example, for the focused clinical question identified earlier, the aim statement might be: Decrease the noise level on the X unit by 50% within 3 months. The measure here might be the decibel level of noise on the unit from before the EBPI innovation until 3 months afterward.

Engage in small tests of change (PDSA cycles)

An important component of the PI model is the cycle known as PDSA described previously. This cycle informs us about how to conduct "small tests of change" before implementing a practice innovation and/or spreading a change throughout an organization. Levin[27] has described the importance of using the PDSA cycle in EBP projects within organizations.

Over the past few years, we learned several lessons about the value of using small tests of change to evaluate processes of implementation before incorporating new practice protocols or other healthcare innovations. As an example, an initial lesson resulted from an EBP pilot study at the VNSNY (R. F. Levin, E. Fineout-Overholt, B. M. Melnyk, M. Barnes, M. Vetter, unpublished data, 2008). Two of the authors worked with home care nurses to

implement a practice change in the traditional EBP/research utilization model of conducting a pilot study in an entire office of the home care agency. As it turned out, had we tried a small test first—limited to a few nurses and clients for a short (perhaps a week or two) period of time—we would have identified process issues that we could have addressed early and would have led to a more successful outcome.

For example, we piloted an evidence-based regularly scheduled telephone follow-up intervention in 1 regional office of the Long Term Care Home Health Program. The positive outcome was that nurses who participated in an EBP educational and mentoring program were able to better identify urgent patient problems. The process challenge was that the nurses did not have a protocol for dealing with these identified problems other than referring that patient to a primary care provider or the emergency department. Thus, the desired aim of decreasing hospitalization rate was not achieved in the pilot study. Rather, hospitalization rate increased among the nurses who participated in the EBP program. By using the PDSA cycle, we are able to identify process issues early, thus allowing a refinement of the evidence-based protocol before implementing a large pilot over an extended period of time.

Also, during this phase of the EBPI model, desired outcomes are addressed and evaluated. For example, in a recent EBPI project at the VNSNY aimed at increasing nurses' communication with primary care providers about patients' pain regimens to decrease patients' pain and improve quality of life, we found that nurses were in fact increasing their communication with primary care providers. Beginning anecdotal data and data collected via patient medical record audits also identified improved management in several cases. These are process outcomes that are observed during PDSA cycles. Patient outcomes, however, are not always observable right away. That is why data collection at periodic intervals after the new practice is implemented on a wider scale is so important.

Disseminate best practices

Once the small tests of change are finished and the process of implementing the practice change is perfected, dissemination on a wider scale is appropriate. We suggest a longer pilot project now, perhaps over a few months, to begin to collect outcome data that may be compared with the benchmarks in the aim statement. Also, the perfected process may work well with a few nurses who are collaborating on an EBPI project during the PDSA cycle, but will the innovation remain viable on a larger scale? Thus, the pilot may be conducted on 1 or 2 hospital units, or in 1 division or office of a community health agency (eg, long-term care). When we see that all involved are able to carry out the process and we are achieving at least a trend toward improved outcomes, we can disseminate a best practice throughout an entire agency. However, we recommend continuing to monitor process and outcome measures for an extended period of time (at least 2 years) to determine both effectiveness and sustainability.

Dissemination also includes sharing best practices, once supported with measurable outcomes, to the external professional community. This entails presenting at conferences and publishing results of EBPI projects in appropriate journals. Only through collaboration and sharing our successes (and failures) with hard evidence can we raise the quality of patient care to the heights we desire.

Summary

To summarize, the 2 major attractions of the EBPI model are its simplicity and its practicality. Leonard Da Vinci stated: "Simplicity is the ultimate sophistication." According to several of our clinical colleagues, from direct care providers to agency administrators, the EBPI model gives clear direction on how to develop, implement, and evaluate innovations aimed at improving healthcare. This systematic—one step at a time—approach helps avoid organization-wide implementation of practices that are based on little, poor, or no evidence. The use of the

model also helps avoid the dissemination of practice changes on a large scale before the processes needed for successful implementation have been tested and refined. Also important is the opportunity to determine who will implement these practice changes and to assess the knowledge they will need to do so.

One disadvantage of the model noted by some may be the length of time it may take to systematically apply such a disciplined approach to improvements. (In the authors' experience, a successful project may take anywhere from 6 to 18 months to implement.) In the long run, however, taking the time to follow the EBPI model as described in this article can save precious resources, both human and financial, because the chance of reaching desired outcomes is greater than when implementing change on a whim, opinion, or little quality evidence.

CONCLUSION

In conclusion, we believe that we have integrated the best aspects of 2 separate but useful paradigms, EBP and PI, into a more useful model, EBPI. More than a conceptual exercise, we have tested this model in both a community hospital in the suburbs and a large home health agency in a metropolitan area. We hope that it can now be tested on a wider level and help fill the gap that we initially experienced and out of which this model was born. We hope others test this model to add to the conversation and research foundation.

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