Nurses in a variety of roles are responsible for leading evidence-based practice improvements. There are many models and the list of potential implementation strategies is extensive. Yet few in healthcare are prepared to lead EBP through the most difficult step in the process, including implementation and integration of the practice change. Selecting a model, choosing implementation strategies to use and when to apply them, continues to be a bit of an ‘art’. This article describes two models. One model outlines the EBP process. The Iowa Model is well established and used in 38 countries worldwide. Another model, the EBP Implementation Guide, can be used for promoting adoption of clinical practice recommendations in complex healthcare systems by providing an organized method for planning implementation. The EBP Implementation Guide is rapidly spreading and in less than two years, has been adopted for use in 15 countries. The model presents four phases that facilitate selection and use of effective strategies to promote provision of evidence-based healthcare. Both models build upon the seminal work of Everett Rogers.

**KEY WORDS**: Evidence-based practice, evidence-based practice model, Iowa Model, evidence-based implementation model, model, implementation science

Nurses are responsible for leading evidence-based practice improvements. An increasing number of national and international agencies, regulatory standards, and professional organizations endorse evidence-based healthcare. Third party payers in the U.S. (e.g., insurance companies and the Centers for Medicare and Medicaid) are using reimbursement to promote evidence-based care that improves outcomes. In countries with government supported health care, public policy establishes evidence-based health care as the standard. Now with quality comparisons and access to information on the internet, consumers expect evidence-based healthcare as well.

Evidence-based practice is defined as ‘the process of shared decision-making between practitioner, patient and others significant to them based on research evidence, the patient’s experiences and preferences, clinical expertise or know-how, and other available robust sources of information’. Recommendations for evidence-based care are abundant. Yet research shows inconsistent use of evidence globally. Basic nursing interventions from oral care to sleep and activity promotion are difficult despite evidence showing improved outcomes for patients. Even hand hygiene has suboptimal compliance despite strong evidence, regulatory standards and relevance to practice.

Several models guide organizational and project leaders through the steps of the evidence-based practice (EBP) process. Most of these process models include similarity in over-arching problem-solving steps such as identifying a problem; critiquing evidence; implementing appropriate recommendations; evaluating the change in patient outcomes and disseminating results. Additional models and frameworks focus on implementation.

The EBP process model selected for use should assist frontline clinician to move an EBP change forward into practice. Selecting a model for an organization requires thoughtful review by clinician users. The model should be relevant to users and provide guidance given the reality that EBP is a messy, non-linear process. The Iowa Model will be described here, as it is one of the most commonly used globally with over 3,000 requests from
Using the Iowa Model of EBP to Promote Quality Care

The Iowa model begins by encouraging clinicians to identify practice questions or "triggers" (Figure 1). Some triggers have existing data highlighting an opportunity for improvement. Others come from new knowledge (e.g., scientific updates). Even difficult to change practice traditions have been addressed using the Iowa Model. The next step, identifying organizational priorities will facilitate garnering support for EBP. Priority may be given to topics that address high-volume, high-risk, or high-cost procedures, those that are closely aligned with the institution's vision or strategic plan, or those driven by other institutional or market forces.

Once there is commitment to address the topic, a team is formed to develop, implement, and evaluate the practice change. The team includes stakeholders representing staff nurses, interdisciplinary colleagues, with unit and organizational leaders. Unit leaders establish the continued commitment, adjust

![Iowa Model of Evidence-Based Practice to Promote Quality Care](image)
scheduling to promote staff nurse participation, and integrate the practice into clinician's workflow. EBP experts may be team members or consultants serving to mentor clinicians, obtaining funding, and troubleshoot application in practice. Team members also provided active committee linkages within the governance structure through their membership. For example, an oral mucositis EBP included members from nursing quality, hospital dentistry, dietary, hematology- oncology, radiation oncology, oral pathology, patient education, staff education, the products committee, nursing policy committee, and the nursing management council. The team used these linkages to support communication and coordination.

Initially, the team selects, reviews, critiques, and synthesizes available research evidence. Collaboration with librarians can be particularly helpful in optimizing yields from online bibliographic databases and other resources. When the research is sufficient or lower level evidence are used, a practice change is piloted. Piloting is an essential step in trialing the EBP change and is essential for identifying issues before instituting a hospital-wide rollout. Piloting involves multiple steps. Developing a practice protocol can take many forms including development of an evidence-based policy, procedure, care map, algorithm, or other document outlining the practice and decision points for clinician users. Implementation during the pilot requires planning and selection of effective implementation strategies. A comparison of baseline and post-pilot data shows the success of the pilot, effectiveness and feasibility of the EBP, and need for modification of either the implementation plan or the practice protocol.

Following the pilot, a determination is made regarding appropriateness of sustained adoption in the pilot unit and beyond. A decision regarding adoption or modification of the practice is based upon pilot data. If the practice change is not appropriate for adoption and rollout, quality or performance improvement monitoring is needed to ensure high-quality care. If pilot results are positive, rollout and integration of EBP are facilitated through leadership support, education, and continuous monitoring of outcomes. Monitoring and reporting trends in structure, process, and outcome indicators with actionable feedback promotes integration. Dissemination of project results is a key step in the cycle promoting adoption of EBPs within the system.

The Iowa model provides a practical guide for the EBP process. The model includes feedback loops highlighting the messy and nonlinear nature of EBP and support teams moving forward. The Iowa model was designed to support evidence-based healthcare delivery by interdisciplinary teams. The Iowa Model provides step-by-step direction but some steps require careful consideration and planning. 

**Guiding Implementation**

As practitioners know, the change process is complex. Change theories provide a conceptual foundation, yet lack direction for planning and rarely address the needs of teams. Teams need step-by-step guidance for implementation at the point of care. Current approaches are ineffective and lead to "reduced patient care quality and raises costs for all, the worst of both worlds".

The Evidence-Based Practice Implementation Model builds upon Rogers (2003) Diffusion of Innovation Theory and several others. In addition, the implementation model draws from the field of implementation science, translational research and EBP, organizing the long list of implementation strategies that promote adoption of EBP. In addition to these sources, patterns from use of a variety of implementation strategies from decades of work added insight in its development. It is well established that change happens over time and a large number of implementation strategies have been tested and reported, yet, there is little direction regarding when to use specific strategies throughout the implementation process. This model is meant to supplement EBP process models, not replace them. It is designed to be simple and intuitive.

**The Evidence-Based Practice Implementation Guide**

The Evidence-Based Practice Implementation Guide (Figure 2) is organized to provide clinicians and leaders guidance in planning for and select effective strategies for implementing EBP changes. Strategies are selected and positioned in the model to enhance the movement through four phases of implementation: creating awareness and interest; building knowledge and commitment; promoting action and adoption; pursuing integration and sustainability to promote application. Implementation phases are displayed as columns progressing from awareness to integration. Implementation strategies are arranged in two rows, according to target groups. The first group of strategies, shown in row one, specifically target the practitioners and organizational leaders, including key stakeholders. The second group of strategies, shown in row two, builds support within the organizational system or context, to hard wire the
EBP to improve adherence. Project leaders select implementation strategies moving across phases that are appropriate for their particular unit and organization as the EBP initiative progresses. Although the model is diagrammed in a linear format for ease of use, the process is not linear and is fluid across implementation phases. Within a clinical team, practitioners may be in different phases or move forward or back across phases in a non-linear manner. Some strategies from an earlier phase will need to be carried over for use throughout the implementation process.

**Selecting Implementation Strategies**

No standard set of implementation strategies can be...
suggested. Evidence supporting individual strategies varies and is beyond the scope of this paper. Implementation strategies with some empirical evidence are marked with asterisks, despite the varying strength of evidence. Thus, a simplified system is used so as not to distract from use of the model. Within less than two years, the EBP Implementation Guide has already demonstrated usefulness, with over 700 requests from 15 countries.

Some strategies are highly effective and widely applicable. For example, audit and data feedback have extensive research evidence, supplemented by reports from practice. Academic detailing or educational outreach visits are a strategy with evidence showing impact particularly on physician prescribing in ambulatory settings and growing evidence in other settings, impacting other healthcare practices and practitioners. Some implementation strategies included in the model have little to no research evidence of effectiveness (e.g., education using unit posters; reporting of local case studies demonstrating an opportunity for improvement; creating slogans and logos). Despite these challenges they are commonly used strategies and may be appropriate to include in a comprehensive implementation plan.

In addition to varying bodies of evidence for each implementation strategy, is the added issue of localizing use to the clinical context. Implementation strategies are expected to work differently in different settings. What works in one area may not work in another. Selection of implementation strategies is based on strength of evidence, adaptability to the setting, expectations of clinicians and guided by user feedback.

Creating Awareness and Interest

Becoming aware and interested in a practice change is the first step toward adoption (Column 1 of Figure 2). These strategies start early and some may be helpful throughout the implementation and sustainment phases. Interest wanes over time due to competing demands and staff turnover. Multifaceted, on-going strategies are needed to keep the practice change in the forefront.

Highlighting the positive characteristics of an EBP change such as the relative advantage and compatibility with group values can promote awareness and interest among clinicians. Although empirical evidence is limited, creating slogans and logos can be a fun way to grab the attention of busy clinicians. Creating a contest to generate a project slogan can get staff involved. Strategically placing these logos on project related materials throughout implementation (e.g., resource manual or materials, reminders, and data feedback) keeps busy clinicians focused on promoting adoption.

Involve senior executives early. Senior leaders want to support clinician driven evidence-based improvements and need sufficient information about the purpose, resource needs and anticipated return on investment to do so. Senior executive leadership promotes uptake and sustained use of EBP recommendations. Announcements from senior leaders create a sense of urgency, articulate an organizational commitment, demonstrate resources are available and an impact is expected that matches organizational priorities.

Building Knowledge and Commitment

Interventions that increase practitioner’s knowledge of and commitment to the clinical practice recommendation are designed to build on the awareness and interest, and likewise require multifaceted on-going attention. One useful approach is to have a core group of change agents use academic detailing, identify practice gaps, localize the EBP to the setting and use train-the-trainer. One method of interactive education matching nurses’ preference to learn from their colleagues is to engage and train change agents. There are many different change agent roles described in the literature, including internal and external facilitators. Identify change agents early from relevant disciplines, get their support, and provide education about the practice change and their role functions as background work.

Comparing organizational outcomes to benchmarks through a gap assessment increases clinician’s knowledge and commitment by highlighting the gap in performance. Unlike strict research protocols, clinical practice guidelines are designed to be locally adapted to individual settings. Focusing on the few key steps that are critical promotes adoption by simplifying the change. Articulating how the practice change was simplified to assist clinician-users can stimulate their commitment.

The timeline for adoption should allow for focused effort building practitioners’ knowledge and commitment before proceeding, providing an essential foundation for promoting adoption of EBP through changes in practice. This phase should be clearly articulated with an approaching “go live” date that creates motivation to participate.

Promoting Action and Adoption

After raising awareness, promoting positive attitudes, and
building knowledge about the change, the next imperative is to change clinician’s behaviors and put EBP into practice. Frequently the ‘implementation phase’ described in the literature is really the point when adoption is expected, neglecting the required ground work. Interventions to promote action or adoption need to move from active to interactive and target the clinicians so they develop needed skills. Training, role-modeling and coaching by the change agents is essential. Follow-up from unit leaders and change agents is needed for troubleshooting, reinforcing the desired behavior, and providing recognition at the point of care for correctly and consistently applying the practice recommendations.

Practical strategies such as practice prompts promote behavior change by providing timely reminders at the point of care. Practice prompts can be sophisticated reminders within the electronic record that require justification for practice variation or a simple pocket guide with a logo. Creating patient reminders, clinical checklists, and standing orders build support within the system.

The action and adoption phase of implementation will require several weeks to complete. During this phase clinicians are trying out the practice change, finding ways to integrate the new practice into their workflow, adapting the practice for unique patient circumstances, and doing small scale evaluation. Time is needed for progressive uptake of the EBP when change agents are actively promoting adoption and practitioners are trying it out. Continued use of implementation strategies is essential throughout this phase as early and late adopters proceed at varying rates. Audit with actionable and timely data feedback is essential and highly effective for both adoption and integration of the practice change by building support within the organizational system. Timing should allow for trying the practice change before full evaluation of process and outcome indicators.

Some clinicians will lag in action and adoption. Highly interactive and individualized feedback are needed for clinicians working through adoption while the group has moved on. Late adopters will be watching early adopters’ success and slowly become active adopters. Having clear expectations and administrative follow-up will facilitate adoption. Involving a group leader from among late adopters in planning and troubleshooting early may also be helpful.

Pursuing Integration and Sustainability

In order to achieve a return on the investment from working through the EBP process, it is essential to realize integration and sustained use of evidence-based health care. Senior leadership recognition in public forums shifts expectations and group norms toward EBP. Integration of clinical practice recommendation into daily healthcare practices requires additional strategies by clinical teams and senior leaders, including strategies built within the social system matching the organizational culture. Reporting results of implementation and revisions based on both evaluative data and practitioner feedback can facilitate additional commitment to sustained use. Periodic feedback of evaluative data with review and reinfusion of the practice change prevents slipping back into old practice patterns. Updating postings and practice reminders keep the message fresh and in the forefront. Reinfusion is needed through the early months of integration to sustain the gains already achieved.

Visual displays of key indicators may help integration. Creating peer to peer discussions articulating the expectations (i.e., peer influence) and using comparative data is likely to be effective. Reporting and feedback of trended data supports progressive integration providing positive reinforcement. Periodic reporting and trend of results also assists with quick identification of a need for reinfusion. Early and active planning for reinfusion and sustainability is highly recommended to prevent slippage or loss of momentum.

Reporting of project activity and results should target committees within the infrastructure responsible for policy approval, documentation, staff education, quality improvement, EBP and even product inventory. Building responsibility for on-going EBP work into a new or existing unit or organizational committee will keep responsibility clear. Multiple strategies are needed to move from awareness to integration and should target the people as well as the social system.

CONCLUSION

The Iowa Model guides clinicians through the EBP process. The model includes feedback loops, reflecting mid-stream correction needed throughout the process. These are critical to adopting evidence to the practice setting and promoting adoption within the varying healthcare systems and settings within which nurses’ work. The feedback loops highlight the messy and nonlinear nature of EBP and support teams moving forward. The Iowa Model was designed to support evidence-based healthcare delivery by interdisciplinary teams by following a basic problem-solving approach using a systematic but simple process, and being highly application oriented. The large number
of nurses and organizations using the Iowa Model attests to its usefulness in practice.

Implementation science is a young field, none-the-less there is a growing body of research showing the impact of a variety of implementation strategies on nurse-sensitive outcomes. Practical approaches for implementation of practice include the EBP Implementation Guide. It is possible that because of the fluid, complex and interactive nature of implementation and the impact of contextual variations, prescriptive and rigid timing of strategies may never be appropriate. Critical thinking skills of nurses in evaluating and adapting strategies to the changing conditions on the ground will always be required. Wensing et al. (2010) describe selection of implementation strategies as an ‘art’, stating that "research-based evidence can provide some guidance but cannot show decisively which intervention is most appropriate", yet a structured approach to selecting implementation strategies may be helpful (p. E83). Implementing EBP change is difficult, consequently leaders must use effective implementation strategies to engage clinicians and promote adoption for evidence-based care delivery to improve patient and organizational outcomes. Using these models to guide the process and select implementation strategies adds clarity to steps in the EBP process.

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