The Iowa Model of Evidence-Based Practice to Promote Quality Care

The *Iowa Model of Evidence-Based Practice to Promote Quality Care* (Titler et al., 2001) provides guidance for nurses and other clinicians in making decisions about clinical and administrative practices that affect patient outcomes. The Iowa model (Figure 13.3) outlines a pragmatic multiphase change process with feedback loops. The original model has been revised and updated (Titler et al., 1994, 2001; Watson, Bulechek, & McCloskey, 1987). The model is currently being reviewed and may be updated soon. The model is based on the problem-solving steps in the scientific process and is widely recognized for its applicability and ease of use by multidisciplinary healthcare teams.

Overview of and Using the Iowa Model

*Identify "**Triggers.**"* The Iowa model begins by encouraging clinicians to identify practice questions or "triggers" either through identification of a clinical problem or from new knowledge. Important triggers often come from questioning current practice. Problem-focused triggers will often have existing data that highlight an opportunity for improvement. Knowledge-focused triggers come from disseminated scientific knowledge (e.g., national guidelines, new research) leading practitioners to question current practice standards. Knowledge-focused triggers are more likely to create top-down change and require more planning for implementation (B. Rakel, personal correspondence May 21, 2013).

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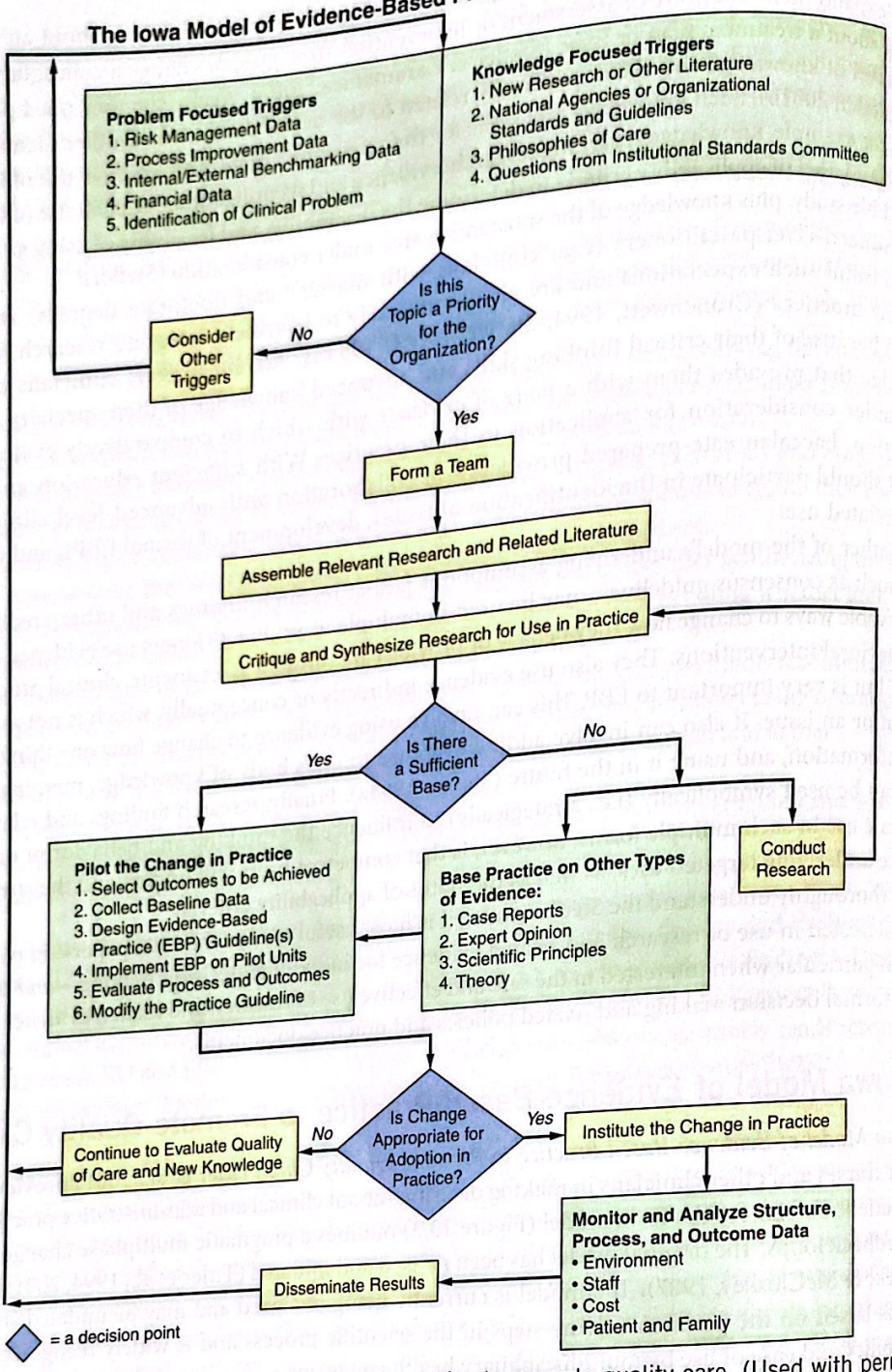

Figure 13.3: The Iowa model of evidence-based practice to promote quality care. (Used with permission from Marita G. Titler, PhD, RN, FAAN, University of Iowa Hospitals and Clinics, © 1998. For permission to use or reproduce the model, please contact the University of Iowa Hospitals and Clinics at (319) 384. 9098.)

Clinical Applications. Nurses identify important and clinically relevant practice questions that can be addressed through the EBP process. A number of clinically important topics have been addressed using the Iowa model, including verification of nasogastric tube placement (Farrington, Lang, Cullen, & Stewart, 2009), hypothermia management (Block, Lilienthal, Cullen, & White, 2012), newborn hyperbilirubinemia (Nelson, Doering, Anderson, & Kelly, 2012), oral mucositis (Farrington, Cullen, &

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Dawson, 2013), newborn skin-to-skin contact (Haxton, Doering, Gingras, & Kelly, 2012), fragility fracture (Myrick, 2011), and depression screening (Yackel, McKennan, & Fox-Deise, 2010).

Operational topics and programs have also been addressed using the Iowa model (Chung, Davis, Moughrabi, & Gawlinski, 2011; Krom, Batten, & Bautista, 2010; Mark, Latimer, & Hardy, 2010; Popovich, Boyd, Dachenhaus, & Kusler, 2012; Schulte, Bejciy-Spring, & Niese, 2012). Important issues have been addressed using the Iowa model well ahead of regulatory standards or changes in reimbursement (e.g., pain, falls, suicide risk, urinary catheter use) by supporting EBP projects on important clinical topics identified by clinicians. Administrators and nurses in leadership positions can support clinicians' use of the EBP process by creating a culture of inquiry, clinician ownership, and a system supporting evidence-based care delivery (Cullen, Hanrahan, Tucker, Rempel, & Jordan, 2012; Everett & Sitterding, 2011; Gerrish et al., 2012; Gifford, Davies, Edwards, Griffin, & Lybanon, 2007; Gifford et al., 2013; Hauck, Winsett, & Kuric, 2013; Kelly et al., 2011; Saint et al., 2010).

Organizational Priorities. Not every clinical question can be addressed through the EBP process. Identification of issues that are a priority for the organization will facilitate garnering the support needed to complete an EBP project. Higher 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 strategic plan, or those that are driven by other institutional or market forces (e.g., changing reimbursement). Considering how a topic fits within the organizational priorities can aid in obtaining support from senior leadership and other disciplines as well as in obtaining the resources necessary to carry out the practice change. Discussions determining if the clinical issue is an organizational priority create early opportunities to connect with stakeholders. If the trigger is not an organizational priority, practitioners may want to consider a different focus, different project outcomes, or other triggers for improving practice that better fit organizational needs. This and similar feedback loops within the model highlight the nonlinearity of the work and support continuing efforts for improving quality care through the EBP process.

Forming a Team. Once there is commitment to addressing the topic, a team is formed to develop, implement, and evaluate the practice change. The team is composed of stakeholders that may include staff nurse(s), unit managers, advanced practice nurses (APNs), interdisciplinary colleagues, and organizational leaders. Team membership requires several considerations to maximize the use of team members' skills and organizational linkages.

During a recent project addressing oral mucositis using the Iowa model, team membership was designed to capture key linkages clinically and within the governance structure (Farrington et al., 2013). The team included members from pediatric and adult ambulatory and inpatient settings representing staff nurses, nurse managers, and APNs. Committee members also provided active linkages within the governance structure through their membership on or links to 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 (Figure 13.4) (Cullen et al., 2012). The team used these linkages to support communication, coordination, and reporting about the initiative. This coordination and collaboration promotes delivery of evidence-based health care (Ida, Adelaide, & Stefania, 2012).

Initially, the team selects, reviews, critiques, and synthesizes available research evidence. Collaboration with nursing librarians can be particularly helpful in optimizing yields from online bibliographic databases and other library resources (Deberg, Adams, & Cullen, 2012; Flynn & McGuinness, 2011; Krom et al., 2010). Librarians' expert knowledge and skills in the functionality of online resources, when matched with clinicians' expertise, will result in yields with the best specificity to address the project trigger. If high-quality research evidence is not available or sufficient for determining practice, the team may recommend using lower levels of evidence (Harmon et al., 2013; Sen et al., 2013) or conduct research to improve the evidence available for practice and operational decisions (Lopes & Galvao, 2010; Staggers & Blaz, 2013; Tucker, Bieber, Attlesey-Pries, Olson, & Dierkhising, 2012). When the evidence is sufficient or lower levels of evidence are used, a practice change is piloted. The team tries the practice change to determine the feasibility and effectiveness of the EBP change in clinical care.

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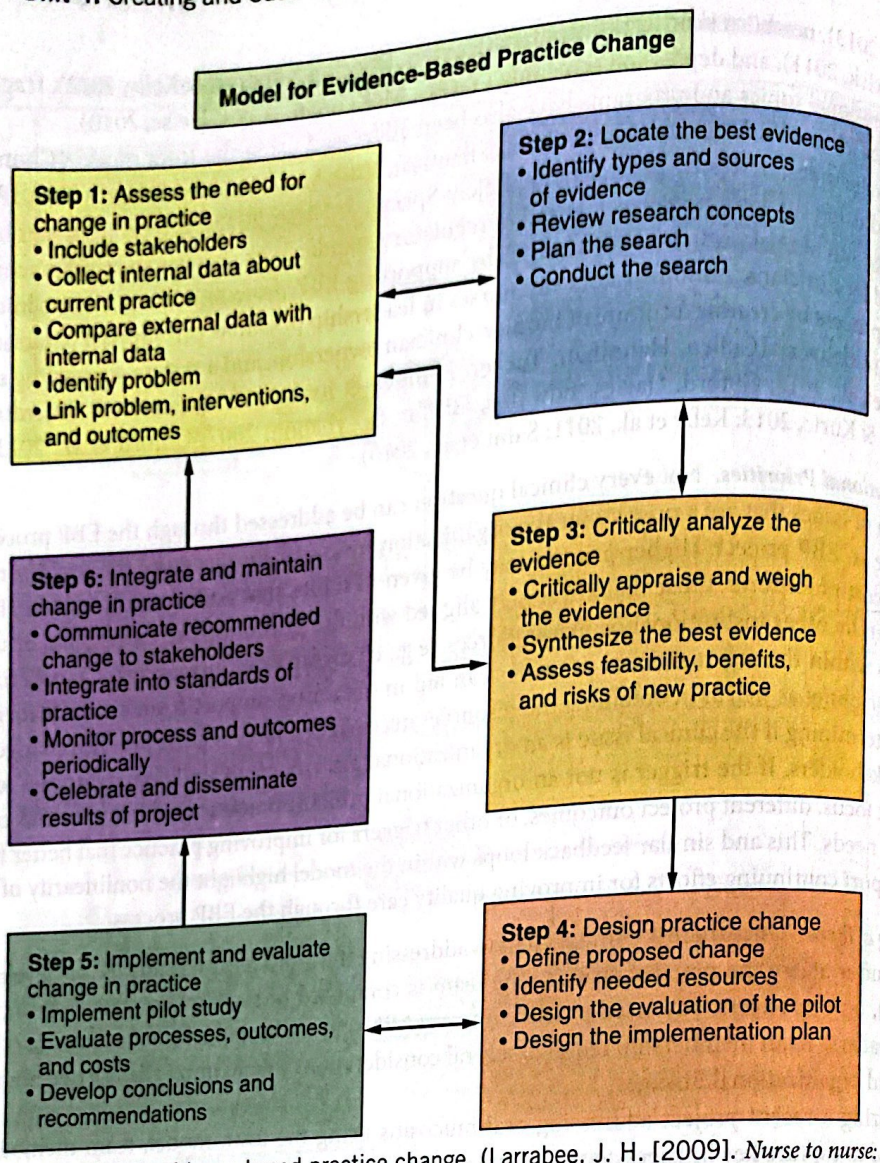

Figure 13.4: A model of evidence-based practice change. (Larrabee, J. H. [2009]. *Nurse to nurse: Practice.* New York: McGraw-Hill. Used with permission.)

Piloting a Practice Change. Piloting is an essential step in the process. Outcomes achieved in a controlled environment, when a researcher is testing a study protocol in a homogenous group of patients, may be different than those found when the EBP is used by multiple caregivers in a natural clinical setting without the tight controls of a research study. Thus, trialing the EBP change is essential for identifying issues before instituting a house-wide rollout.

Piloting involves multiple steps when planning for both implementation and evaluation. The research evidence will provide direction for selecting process and outcome indicators to use for baseline data measurement, although significant simplification of research measures is needed when evaluating QI indicators for EBP. Pilot evaluation is not replication research (i.e., replicating the results of another study) and must be narrowed to key indicators needed to provide direction for clinical decision making. Designing a draft practice guideline or 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 (Cullen & Adams, 2012; Titler, 2008; Titler, Wilson, Resnick, & Shever, 2013; van Achterberg, Schoonhoven, & Grol, 2008). Evaluation of the process and outcome indicators is completed before and after implementation of the practice change. A comparison of pre-pilot

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and post-pilot data will determine the success of the pilot, effectiveness of the evidence-based protocol, and need for modification of either the implementation process or the practice protocol.

Evaluating the Pilot. Following the pilot, a determination is made regarding appropriateness of adoption in the pilot and beyond. A decision regarding adoption or modification of the practice is based on the evaluative data from the pilot. If the practice change is not appropriate for adoption and rollout, quality or performance improvement monitoring is needed to ensure high-quality patient care. Additional steps for clinicians include watching for new knowledge, collaborating with researchers in the area, or conducting research to guide practice decisions. If the pilot results in positive outcomes, rollout and integration of the practice are facilitated through leadership support, education, and continuous monitoring of outcomes (Cheema et al., 2011; Mayer et al., 2011; McMullan et al., 2013).

Evaluating Practice Changes and Dissemination of Results. EBP changes need ongoing evaluation with information incorporated into quality or performance improvement programs to promote integration of the practice into daily care. Monitoring and reporting trends of structure, process, and outcomes indicators with actionable feedback to clinicians can promote sustained integration of the practice change (Hysong, Best, & Pugh, 2006; Ivers et al., 2012; Mayer et al., 2011).

Dissemination of results is important for professional learning. Sharing project reports within and outside of the organization through presentations and publications supports growth of an EBP culture in the organization, expands nursing knowledge, and encourages EBP changes in other organizations as well. Project reports can be used to learn the EBP process, to learn of practice updates, or to generate additional practice questions or triggers. Dissemination of project results is a key step in the cycle promoting adoption of EBPs within the healthcare system (Hauck et al., 2013; STTI, 2008).

The Iowa model guides clinicians through the EBP process. The model includes several feedback loops, reflecting analysis, evaluation, and modification based on evaluative data of both process and outcome indicators. These are critical to individualizing the 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 (Block et al., 2012; Ida et al., 2012; McMullan et al., 2013) by following a basic problem-solving approach using the scientific process, simplifying the process, and being highly application oriented. The large number of nurses and organizations using the Iowa model attests to its usefulness in practice. In fact, over 2,500 requests have been received to use the Iowa model (unpublished data).

Model for Evidence-Based Practice Change

Overview of the Model for Evidence-Based Practice Change

This model is a revised version of the model by Rosswurm and Larrabee (1999). The revised steps and schematic (Figure 13.4) were prompted by Larrabee's experience with teaching and leading nurses in the application of the original model since 1999 at West Virginia University Hospitals and prior experience with teaching and leading nurses in RU and QI (Larrabee, 2004).

The title of the revised model was changed to clarify that it was designed for guiding multiple practice change projects because the author thought the original title, "Model for Change to Evidence-Based Practice," could infer a one-time philosophical decision to pursue EBP. In its application, the actions of the original Step 3, synthesize the best evidence, required a disproportionately longer time to conduct than the other steps. To distribute the actions in Step 3 across two steps and to retain six steps in the model, the original Step 2 was added to Step 1 and the original Step 3 was divided into two: Step 2, "locate the best evidence," and Step 3, "critically analyze the evidence" (Larrabee, 2009, p. 23). The revised model also integrates principles of QI, use of team work tools, and evidence-based translation strategies to promote adoption of a new practice. The handbook (Larrabee) describing the revised model includes a number of forms and examples of their use that may be helpful to nurses applying the model. Progression through the six steps is illustrated by a fabricated EBP project focused on improving outcomes for patients with chronic heart failure.

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Step 1: Assess the Need for Change in Practice

Key actions consist of identifying a practice problem or opportunity for improvement; creating an EBP team of stakeholders to address the practice problem; collecting internal data about that practice; collecting external data for benchmarking with the internal data; and refining the practice problem statement by linking the problem with possible interventions and desired outcomes or by developing a PICOT (population-intervention-comparison-outcome-time frame) question.

Often, recognition of a practice problem prompts an EBP project. Practice problems can be identified by members of a clinical unit's RU team or solicited from practicing nurses. Other times, an existing EBP team with the goal of conducting at least one EBP project per year will need to consider what patient outcomes most need improvement. Structured brainstorming and multivoting are teamwork tools that may be helpful during this process. Developing creative avenues for problem identification that increase active involvement from the nurses who will be participating with the implementation stage, such as placing an idea box on the unit for nurses, is crucial for establishing group ownership for the change project.

Once the EBP team has selected a practice problem as the focus of a project, team members should collect internal and external data relevant to that practice problem to confirm that there is an opportunity for improvement. It is important to justify the focus of the EBP project because such projects are resource intensive. Statistical process control tools that may be useful during this activity include histograms and Pareto charts. The EBP team members must prepare a practice problem statement or PICOT question to clarify for themselves and others what the project focus is and to use the statement or question to guide their work during Step 2.

Step 2: Locate the Best Evidence

Key actions are identifying the types and sources of evidence; planning the search for evidence; and conducting the search for the best evidence. Types of evidence include clinical practice guidelines, systematic reviews, single studies, critical appraisal topics, and expert committee reports. Sources of evidence include electronic bibliographic databases, websites, journals, and books. The search for evidence should be planned as a rigorous systematic review, which includes formulating the research question to guide the search, deciding on the search strategy, selecting the inclusion and exclusion criteria, and planning the synthesis. While planning, EBP team members can add rigor to the systematic review by selecting forms for critically appraising evidence sources, for organizing data from the evidence sources in a table of evidence, and identifying key points to use when synthesizing the evidence during Step 3. Critical appraisal forms or checklists are available in journal articles (Rosswurm & Larrabee, 1999) and online, including some that are for systematic reviews and specific research designs (Scottish Intercollegiate Guidelines Network, 2007).The handbook includes examples of forms and completed examples of their use (Larrabee, 2009).

Step 3: Critically Analyze the Evidence

Key actions are critically appraising and judging the strength of the evidence; synthesizing the evidence; and assessing the feasibility, benefits, and risks of implementing the new practice. Critical appraisal of the evidence is conducted using the forms selected during Step 2. Likewise, the forms selected during Step 2 are used to display information about the data sources in an evidence table that is then used to prepare the synthesis worksheet. After synthesizing the evidence, the EBP team members judge whether the body of evidence is of sufficient quantity and strength to support a practice change. If so, EBP team members consider whether or not benefits and risks of the new practice are acceptable and whether the new practice is feasible in their workplace.

Step 4: Design Practice Change

Key actions include defining the proposed practice change; identifying needed resources; designing the evaluation of the pilot; and designing the implementation plan. The description of the new practice may be in the form of a protocol, policy, procedure, care map, or guideline and should be supported by the

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body of evidence synthesized in Step 3. Needed resources will be specific for the new practice and may include personnel, materials, equipment, or forms. Even if the new practice is specific to just one unit, its use should be pilot tested to evaluate it for any necessary adaptation before making it a standard of care. Therefore, EBP team members need to design the implementation plan and the evaluation plan, considering translation strategies that promote adoption of a new practice. Some strategies include use of change champions, opinion leaders, educational sessions, educational materials, reminder systems, and audit and feedback. After designing the evaluation plan, EBP team members collect baseline data on the process and outcome indicators for which they will collect post-pilot data during Step 5.

Step 5: Implement and Evaluate Change in Practice

Key actions include implementing the pilot study; evaluating process, outcomes, and costs; and developing conclusions and recommendations. The EBP team members follow the implementation plan designed during Step 4, obtaining verbal feedback from those expected to use the new practice and from the change champions who are promoting the use of the new practice. That feedback will be used to make minor adjustments in the implementation plan, if necessary. After the pilot phase concludes, the EBP team members collect and analyze the post-pilot data, comparing with the baseline data. Team members use those data together with the verbal feedback to decide if they should adapt, adopt, or reject the new practice. Few teams reach this stage and decide to reject the new practice. More commonly, the new practice needs to be slightly adapted for a better fit with the organization. Once team members make this decision, they prepare conclusions and recommendations to share with administrative leaders during Step 6.

Step 6: Integrate and Maintain Change in Practice

Key actions include sharing recommendations about the new practice with stakeholders; incorporating the new practice into the standards of care; monitoring the process and outcome indicators; and celebrating and disseminating results of the project. Team members provide information about the project and their recommendations to all stakeholders, including administrative leaders who must approve making the new practice a standard of care.

Once that approval is given, the EBP team members can arrange to provide inservice education to all providers expected to use the new practice. It is important to include all stages of the process in the inservice education, such as problem identification and the strength of the evidence, as teams that emphasize only the practice change have higher rates of noncompliance during the implementation phase. They should also make plans for ongoing monitoring of the process and outcome indicators. The frequency of this monitoring can be based on judging how well the indicators are being met. The data from ongoing monitoring can be used to identify the need for further refinements in the new practice or the need for a new EBP project. The handbook (Larrabee, 2009) provides a timeline template for preparing an annual calendar with multiple EBP projects, including ongoing monitoring of completed projects. Finally, EBP team members should consider disseminating information about their project outside the organization through presentation at professional conferences and publication.

The Evidence-Based Advancing Research and Clinical Practice Through Close Collaboration (ARCC©) Model: A Model for System-Wide Sustainability of Evidence-Based Practice

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