Evidence-based practice is an important force in healthcare today. Its impact on the practice of the advanced practice nurse (APN) is becoming more apparent with the development of practice guidelines and protocols. The phrase, “That's the way I've always done it,” is being replaced by, “This practice is evidence based.” The philosophy of supporting practice with scientific evidence is not new but has been revitalized and emphasized as protocols have been developed to “mold” practice to achieve successful outcomes.

This revolution is being applied to all areas of healthcare practice. Assessment of the patient is usually the first contact the APN has with the patient. It is an important time to gather information from the patient interview, physical examination, laboratory data, and test interpretation. Scientific evidence, properly interpreted, is applied in this step of assessment. The APN will then use clinical judgment and the knowledge gained from graduate education to assist with the formulation of a diagnosis. The APN has a unique opportunity to promote an evidence-based practice model at the grass roots level and persuade the bedside nurse to integrate this process into his or her practice. Ultimately, patients will receive better care and outcomes will be improved using evidence-based assessment.

(KEYWORDS: evidence-based assessment, evidence-based practice)

In the past 10 years, there has been a subtle paradigm shift in the research literature defining how healthcare practice should be developed and performed. This “evidence-based” research is being generated by centers such as the Agency for Healthcare Research and Quality (the former Agency for Health Care Policy and Research) and adopted as the preferred model when formulating clinical practice guidelines. Older paradigms of clinical practice were based on three assumptions: (1) unsystematic observations from clinical experience were sufficient for maintaining knowledge, (2) understanding the basic mechanisms of disease and pathophysiologic principles as well as a thorough training/education was an adequate guide for clinical practice, and (3) content expertise and clinical experience were sufficient to guide clinical practice. The newer paradigm for practice advocates that: (1) clinical experience and the development of clinical instincts regarding diagnosis are crucial for competent practice, (2) understanding the basic mechanisms of disease and pathophysiologic principles are important but not sufficient guides for clinical practice, and (3) understanding certain rules of evidence are necessary to guide practice correctly. The notion of using research in...
practice is not new or unique; however, the emphasis is now on a systematic approach to the analysis of research, using this information to influence practice, and then analyzing and evaluating the outcome of the clinical application. This concept of evidence-based practice should be applied to all aspects of patient care including assessment, the first component of data collection leading to a final diagnosis. It is important to understand that all practice will not have evidence to support it, but as much practice as possible should be supported by the best available evidence.²

### Rules of Evidence

Understanding basic rules of evidence as applied to assessment may help guide practice. Two rules commonly used with assessment findings are sensitivity/specificity and kappa (κ) statistic. Sensitivity and specificity describe the discriminatory power of physical signs.³ Sensitivity is the proportion of patients with the diagnosis who have the physical sign (ie, the positive result), while specificity is the proportion of patients without the diagnosis who lack the physical sign (ie, the negative result).³ An example would be determining if the physical sign of cachexia is sensitive or specific for the diagnosis of pneumonia. Cachexia has a sensitivity of 10% and a specificity of 97% for pneumonia.³ These data can be interpreted that cachexia is not sensitive for the diagnosis of pneumonia because only 10% of the sample had cachexia with the diagnosis of pneumonia. However, the data are not specific for the diagnosis of pneumonia because 97% of the sample did not have cachexia and did not have the diagnosis of pneumonia. A good physical sign that can be used for a diagnosis should ultimately have a high sensitivity and a low specificity. Understanding these terms can be challenging at times. Sackett et al suggested a pneumonic to aid with interpretation: “SpPin” (ie, a specific test, when positive, rules in disease) and “SnNout” (ie, a sensitive test, when negative, rules out disease).³

Another statistical term that may appear associated with physical signs is the κ statistic that addresses the reliability of the physical finding. Interrater reliability refers to how often multiple clinicians agree that a particular sign is present or absent when examining the same patients.³ The κ statistic also considers the possibility that there could be agreement among the observers simply by chance. The range of the κ statistic is from 0 to 1 and is expressed in intervals that are summarized in Table 1. Even with appropriate reliability statistics, physical assessment findings do have weaknesses but can be useful when used in combination with other data.

In the present era, physical assessment seems antiquated as technology becomes the hallmark of diagnosis. There must be a judicious balance between these two modes of data collection. Physical assessment is vital in the diagnostic process. Competent performance and understanding of the validity of assessment techniques are essential. The value of clinical touch and patient interaction is not easily quantifiable but is paramount in developing the correct diagnosis. Every practitioner has witnessed the expert assessment skills of an experienced clinician and the impact of this “sensitivity and specificity” in helping diagnose a patient’s condition. My memory is of an older cardiologist whose auscultation skills were so refined that he was able to discern when a patient had a right bundle branch block with 100% accuracy and without the use of monitoring devices. The science behind this physical assessment finding is a widened physiologic splitting of the second heart sound due to delayed electrical activation of the right ventricle.⁵ With this type of evidence, an APN could integrate the data into the diagnostic

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process and order a 12-lead electrocardiogram to confirm the suspicion of a bundle branch block. This is an excellent example of evidence-based assessment because it represents the integration of clinical expertise, intuition, training, and research knowledge. This level of integration optimizes patient outcomes and should be the goal of the APN.

Evidence-based Assessment

To demonstrate that evidence-based assessment is possible, a discussion of the physical finding of impaired level of consciousness will be explored using an evidence-based model. Impaired level of consciousness is a broad term but does have a $\kappa$ statistic of 0.65 to 0.88 assigned to it. That value indicates a moderate to substantial agreement between observers but specifics of this agreement are unclear.

What is really meant by impaired level of consciousness? A change in level of consciousness could encompass presentations such as delirium, dementia, confusion, or cognitive impairment. In an attempt to standardize assessment technique and language, experts have developed tools to evaluate the different presentations. The Mini Mental Status Examination (MMSE) is a classic tool developed by Folstein and colleagues in 1975 to be used at the bedside to determine dementia. It tests orientation, registration, attention, calculation, recall, and language, using various questions for a maximum score of 30. The $\kappa$ statistic for the MMSE ranges from 0.28 to 0.80, which should prompt the practitioner to explore the weaknesses of the test. The patient’s education level can influence the MMSE result. Another test for dementia is to have the patient draw the face of a clock. This test overcomes the patient education issue and has a $\kappa$ statistic of 0.73.

There are also specific tests to determine states such as delirium; the Confusion Assessment Method has a $\kappa$ statistic of 0.81. The clinician has four clinical features to consider: (1) change in mental status that is acute and fluctuating, (2) difficulty in focusing attention, (3) disorganized thinking, and (4) altered level of consciousness. A positive test requires the presence of the first two features and either the third or fourth feature. Expert APNs should be aware of the weaknesses of these tests and use them appropriately in their assessment technique.

The Glasgow Coma Scale (GCS) is a familiar tool used for years to assess level of consciousness. It was developed by Teasdale and Jennett in 1974 to standardize and improve communication regarding their patient’s level of consciousness as they were being transported to a larger healthcare center in Scotland. The GCS has become the universal tool for describing altered level of consciousness, and has also been tested to try to predict patient outcomes. Even though the GCS is widely used and established, it has weaknesses that are commonly recognized. Gill et al. tested use of the GCS in a typical broad sample of emergency department (ED) patients, which showed only moderate intrarater reliability with a $\kappa$ statistic of 0.59 for eye opening, 0.37 for verbal response, and 0.58 for motor response. The lower $\kappa$ statistic in the verbal response reflects the difficulty of the observer in determining mentation when the choices are limited to: oriented, confused, inappropriate, incomprehensible, or none. The authors concluded that the GCS could not be used as a precise measurement of a neurologic condition for ED patients. This study and others support the conclusion that based on current evidence, no one tool can encompass a thorough neurologic assessment for impaired level of consciousness. However, each tool has a value however, using a combination or sequence during assessment might improve accuracy.

Even though the discussion has focused on physical findings in the assessment process, the same analytical process can be applied for other components of the assessment process (eg, laboratory and radiologic tests). Applying all the components of the new paradigm of evidence-based practice will assist APNs in developing a sophistication in their practice to improve patient outcomes.

Evidence-based Practice Model for the APN

Evidence-based assessment and practice are a compilation of various components essential to the advanced practice nurse role. The
APN is in a strategic position to be a champion of evidence-based practice in nursing. There are five process components to successful implementation: (1) education, (2) clinical expertise, (3) evidence, (4) evidence integration, and (5) productive power. The first three components were main factors in the level of consciousness discussion reviewed earlier. Education provides the basic infrastructure for the germination of the evidence-based “seed.” Graduate education assures the APN of an understanding of advanced pathophysiologic principles as well as the application of research. Academic skills and the ability to perform effectively a Web-based literature search are indispensable competencies for current practice. However, basic graduate education must be augmented with professional judgment. Clinical expertise must never be under- or overestimated in its importance to the development of the model. Professional judgment is essential during “the clinical reasoning process to evaluate the quality of evidence, to determine when sufficient evidence has been obtained, to make diagnostic and treatment decisions, and to address the patient’s unique needs.” This factor counters the argument that evidence-based practice is a “cookbook” approach to healthcare. Supporting evidence must be continually pursued in order to maintain a current and appropriate clinical practice. Research-based scientific information is the ultimate goal, but may not always be available, especially in nursing practice. Evidence that can guide clinical practice may include knowledge that is derived from a variety of credible sources. However, this body of information is huge, and even the best practitioner will need assistance from clinical experts as to how to use this information properly. The previous discussion regarding the assessment of loss of consciousness confirms that large amounts of evidence are available but recognized clinical experts may need to propose a system or guidelines to properly use and meld these available assessment tools.

The last two components, evidence integration and productive power are the newer components listed for successful implementation of evidence-based practice. They are sometimes alluded to in the discussion of the model but need to be addressed purposefully if success is to be achieved. They also may be the factors that that can distinguish APNs from physicians because it is the APN’s ability to utilize his or her knowledge of systems to improve function that can make the difference between success and failure. A practitioner can collect research and/or evidence and acknowledge its importance but may not always integrate it into his or her practice. Reasons for this inaction include fear, misunderstanding, prejudice, and lack of time as well as other rationales. An APN may have attempted to apply a practice protocol; however, resistance to change at all levels is a common barrier when integrating evidence into practice.

Another aspect of integration is the testing of outcomes. Frequently, “cutting edge” information is being applied clinically but the final step of documenting a positive change in outcomes must also be included in the evaluation process. If outcomes are not improved, the argument can be made that the practice may not be evidence based. To assume that integration and outcomes evaluation always occurs may be an error. Evidence integration must be formalized in order for evidence-based practice to be achieved.

The final component is productive power, which refers to the spheres of influence of the APN. Productive capacity consists of many types of power including informational, expert, legitimate, referent, charismatic, reward, coercive, and/or self. All aspects of power must be considered when attempting to implement change, and the type of power used may vary depending on the situation that an APN encounters. The reason to include this component in the model is that evidence-based practice performed by one individual is important but influencing and improving practice of others is the ultimate goal when establishing an evidence-based practice system. How the APN uses productive power is critical for successful implementation of the evidence-based practice leading to improved patient-centered care (see Figure 1).

**Summary**

The concept of evidence-based practice has been evolving for more than 10 years and
has produced positive patient outcomes. The APN is an essential component in this transition. Establishing an evidence-based assessment process is an important new goal. The APN’s ability to understand the scientific process, review literature, and apply current evidence is essential. In collaboration with our expert colleagues, we can work to implement accurately and efficiently our evidence-based practice. This model clarifies the most important concepts for successful implementation of evidence-based practice. We are moving beyond pride and without prejudice, toward practical evidence-based healthcare, to produce the best patient-centered care available.

Figure 1. Evidence-based practice model for the advanced practice nurse.

References