Translating Evidence-Based Practice: Safe and Accurate Blood Pressure Measurement in a Comprehensive Cancer Center

David A. Conlon, BSN, RN, BC, OCN®, PCCN

Hospitals and ambulatory outpatient care centers provide various levels of care to increasing numbers of acutely ill patients. Healthcare providers (HCPs) rely on technology to complement and enhance their ability to accurately and quickly assess patient status. Accurate blood pressure (BP) measurements are important for the routine monitoring of patients’ conditions and during administration of blood products, chemotherapy, and other medications. Infection control also is a critical priority for patient safety, quality care, and economics. Regulatory and credentialing agencies such as the Joint Commission, American Nurses Credentialing Center Magnet Recognition Program®, and the Agency for Healthcare Research and Quality (AHRQ) monitor institutions and HCPs to ensure that patients are receiving safe, high-quality care.

Evidence-based practice is a professional requirement at the University of Texas M.D. Anderson Cancer Center in Houston, TX, and has been for several years. HCPs must support their practice with convincing evidence, not just operate on intuition or anecdotes. When clinical practice requires improvement, nurses must identify a process of change and develop the skills needed to navigate the change.

At M.D. Anderson, a staff nurse (the author) identified several questions regarding BP measurement, which generated the following research questions.

- Are automatic BP devices as accurate as manual BP devices (aneroid manometers)?
- Are the aneroid manometers calibrated routinely and correctly and in good repair?
- Are patients consistently being assessed for correct size of BP cuff to ensure accuracy?
- Does reuse of BP cuffs for multiple hospitalized patients affect infection control?

A more pressing question was, “Can a staff nurse, whose only job is to provide direct patient care for hospitalized patients with cancer, effect a change in practice in a large, tertiary teaching hospital?” The answer to that question was a resounding “Yes,” as evidenced by the project outlined in this article.

The purpose of this article is to describe an evidence-based project regarding the use of aneroid manometers and BP cuffs for multiple hospitalized patients and the changes in practice that occurred as a result of the project.

Background

Healthcare-associated infections are those that patients acquire during the course of receiving treatment for other conditions in a healthcare setting (Scott, 2009). Such infections are the most common complication of hospital care and are among the top 10 leading causes of death in the United States (AHRQ, 2009). The financial burden attributable to the infections is estimated at $28 billion–$33 billion in excess healthcare costs each year (Scott, 2009).

Promoting the use of evidence in practice is an active process. Different types of dissemination strategies are needed to promote the use of research evidence in clinical and administrative decision making, and the strategies must address individual clinicians and organizational perspective (Titler, 2006). Evidence-based practice has been defined by some experts as the integration of best research evidence with clinical expertise and patient values (Titler, 2006). According to LoBiondo-Wood and Haber (2006), evidence-based practice is “the conscious and judicious use of the current best evidence in the care of patients and delivery of healthcare services” (p. 7).

RNs at many hospitals have encountered wall-mounted BP manometers that are loose, are not working correctly, or have the wrong cuff size for the patient. Such situations are time consuming for nurses, who have to resolve the problems before checking patients’ BP. The quick answer generally is to obtain a portable aneroid manometer. However, a portable aneroid manometer is not always a good solution because it may require a nurse to leave the bedside of a critically ill patient. The equipment may not be in a state of good repair and may be unusable or unreliable. Additionally, the reuse of a BP cuff by multiple patients may contribute to hospital-acquired infections.

In December 2006, the author made a list of concerns with the process of taking accurate noninvasive BP measurements. He thought, “Who wants to hear these complaints, and who is willing to assist in the changing of clinical practice?” Fortunately, in early 2006, M.D. Anderson had implemented a revised shared-governance model that enabled clinicians to bring forth clinical practice issues. The Nursing Practice Congress (NPC) is based on a congressional model and is made up of peer-elected direct-care clinical nurses, advanced practice nurses, and specialty nurses. Representatives from information systems, quality improvement, and nurse management also were included. The NPC provides a structure to formally recognize clinical concerns and make decisions by member vote. The intent, consistent with Magnet guidelines, is to ensure that direct-care nurses can identify and change clinical practice issues effectively.

The new shared-governance model provided a tool for the author to assert leadership over a process of change. It was an interesting application of the reversal of the typical top-down approach to institutional change. Bedside RNs initiated and implemented a change to clinical practice from the bottom up.
Planning

In December 2006, the author presented his concerns to members of the NPC, detailing the four questions identified earlier in this article. Based on the identified problems, he conducted a literature review according to the EBP process. The author presented the literature review at an NPC meeting. The response was enthusiastic, and the author was encouraged to formalize his literature review into an evidence table. With the help of a staff clinical nurse specialist, he developed two tables. A Professional Action Coordinating Team (PACT) was recruited to assist the author. The original PACT consisted of three clinical nurses (direct patient care), two clinical nurse specialists, and one biomedical engineer. The PACT made several recommendations to the NPC in March 2007. The NPC voted on and approved the recommendations, at which point the PACT was disbanded. Table 1 provides a timeline of the project.

The list of approved recommendations was as follows.

- Provide staff education regarding the necessity of correct cuff size to ensure accuracy, as detailed by Fonseca-Reyes, de Alba-Garcia, Parra-Carrillo, and Paczka-Zapata (2003).
- Provide staff education regarding the preference for aneroid manometers to measure BP during certain clinical emergencies (Davis et al., 2003).
- Ensure that all beds for hospitalized patients have properly calibrated, wall-mounted aneroid manometers in a state of good repair (Waugh, Gupta, Rushbrook, Halligan, & Shennan, 2002).
- Change clinical practice to use of BP cuffs dedicated exclusively to a single patient, thereby reducing the transmission of pathogens caused by the reuse of cuffs (Bureau-Chalot et al., 2004; de Gialluly et al., 2006).

Following delays of about 12 months in various multidepartmental committees, the author formed a second task force that included representatives from nursing administration, contracts and acquisition, materials management, biomedical engineering, and an equipment vendor. The group identified many practical issues. Prominent among them was the issue of how get a single cuff to fit both single-tube and double-tube configurations. Aneroid manometers typically have an inflation bulb and a single tube connected to the gauge; however, automated vital-sign equipment and all cardiac monitors at M.D. Anderson have a double-tube connection. The biomedical engineering department decided to use the Welch Allyn FlexiPort® (Welch Allyn Company) system, which resolved the problem. The changeover required commitment to a single vendor for cuffs and connectors. This can be convenient for purchasing; however, if the vendor fails to provide a reliable supply of products, a negative impact on patient care can result.

Implementation

A team of staff nurses, with the support of biomedical technicians, manually inspected all wall-mounted aneroid manometers in the target patient-care area. The team gathered information on

Table 1. Timeline for Evidence-Based Practice Project on Blood Pressure Measurement

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
<th>Comments and Status</th>
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<tr>
<td>February 2006</td>
<td>Nursing Practice Congress (NPC) is implemented.</td>
<td>This is the approving body for clinical changes at M.D. Anderson Cancer Center.</td>
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<tr>
<td>Fall 2006</td>
<td>Staff nurse identifies a problem with the use of blood pressure cuffs.</td>
<td>Project leader voiced concerns through appropriate channels.</td>
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<tr>
<td>December 2006</td>
<td>Staff nurse makes initial presentation to NPC, which agrees and votes to form a Professional Action Coordinating Team (PACT),</td>
<td>NPC endorses project.</td>
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<td>January–March 2007</td>
<td>Three PACT meetings are held. First evidence table is created and submitted for review. Project is handed off to nursing administration.</td>
<td>Literature review is completed, and an evidence table is constructed.</td>
</tr>
<tr>
<td>March 2007–March 2008</td>
<td>Multidisciplinary committees reviewed recommendations from the NPC. Delays occur because of committee meeting times, structure, and lack of or deferred action.</td>
<td>Staff nurse remains focused on the project although frustrated regarding timeline.</td>
</tr>
<tr>
<td>March 2008</td>
<td>New multidisciplinary task force is formed. Many meetings and negotiations occur with the vendor, biomedical staff, and nursing.</td>
<td>Author prepares poster for evidence-based program at M.D. Anderson and continues with meetings.</td>
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<tr>
<td>May 2008</td>
<td>Project leader presents a poster during Nurses Week (describing project and offering first evidence table for public display).</td>
<td>Poster is well received during Nurses Week.</td>
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<tr>
<td>November 2008</td>
<td>Educational rollout: Nursing practice protocols are updated online. More than 1,000 employees are educated over a three-day period. Equipment throughout the hospital is reconfigured or repaired. Goal is established to place a wall-mounted aneroid manometer that is in good working order by each patient bed for clinical care and emergencies, which will require the purchase of more than 130 manometers at approximately $150 each.</td>
<td>Change in practice: transition to single-use blood pressure cuffs implemented in fiscal year 2009–2010.</td>
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the number of damaged manometers, tubing sets, and inflation bulbs. The total number of aneroid manometers inspected was 486, and the total number requiring repair or replacement was 164, consistent with rates reported by Waugh et al. (2002). This did not include units that had no wall-mounted manometers. Repairs were performed on 104 aneroid manometers by inpatient bed. Replacement of more than 130 damaged or missing manometers was delayed because of budgetary constraints. They were scheduled to be purchased and installed during fiscal year 2009–2010. Universal adaptors (Welch Allyn FlexiPort) were placed on all inpatient devices that measure BP, such as aneroid manometers, automated vital-sign equipment, apneosis machines, and electrocardiograph monitors. This allowed a single BP cuff to fit easily on either a single-tube or double-tube configuration.

The team initiated an educational event to provide direct training to more than 1,000 members of the nursing staff, including a “train-the-trainer” component to ensure continuity of competence throughout the institution. Participants in the educational event were staff nurses, nurse educators, and vendor nurse educators. The educational intervention was accomplished over a three-day period. An online education bulletin was developed by the author and one of the nurse educators. The content of the training efforts included the proper use of the Welch Allyn FlexiPort connectors, the obligation of the staff to use properly sized BP cuffs, and the relative merits of automatic BP measurements versus manual BP measurements.

Single-user BP cuffs with the Welch Allyn FlexiPort connectors were placed in each unit’s supply room, including the operating rooms.

Impact on Nursing Practice

The nursing staff is better educated concerning the relative merits of obtaining BP measurements with an automatic device versus a manual device. Staff also demonstrates improved compliance with proper cuff sizing. One hundred four malfunctioning aneroid manometers by inpatient beds were repaired, in addition to tubing conversions in other areas of the hospital. The repairs ensured that a single BP cuff was better fitted to either a single-tube or double-tube configuration. Improving compliance with proper cuff sizing is consistent with the conclusions drawn from the literature, suggesting that the reuse of BP cuffs among multiple patients can provide a vehicle for the horizontal transmission of pathogenic organisms (Bureau-Chalot et al., 2004; de Giallully et al., 2006).

Conclusions

This project serves as an example of how a staff nurse using EBPs and shared governance can effect meaningful change in a large hospital. The author, as well as the nursing administration, learned a great deal from the process. Detailed, professionally prepared evidence is required to start a quality-improvement project. All relevant parties in the project should be included, such as staff nurses, administrators, representatives from biomedical and purchasing, contract experts, and equipment vendors. Such a project also requires learning the intricate change process of the hospital, as well as the people and departments responsible for each part of the process. Learn the stakeholders, both formal and informal. In most cases, this will be a new skill set for the person initiating such a project. The project leader must maintain control of each phase and limit the development of tangential projects that may be inspired by the original. Having a realistic timeline and a working knowledge of budgetary considerations that may affect such a project also is essential.

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Leadership & Professional Development

This feature provides a platform for oncology nurses to illustrate the many ways that leadership may be realized and professional practice may transform cancer care. Possible submissions include, but are not limited to, overviews of projects, accounts of the application of leadership principles or theories to practice, and interviews with nurse leaders.

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