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DIALOGUES
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From the Editor

Clinical Scholar’s Review (CSR) was established for faculty, graduates, and students who focus on clinical nursing to (1) build a network of scholarship bridging academe and practice, (2) shape clinical excellence by both building evidence from practice and applying it to practice, (3) offer a repository for examples of the highest level of clinical nursing and comprehensive care, and (4) provide a venue for doctoral students to serve as editors and authors (Smith, 2008). This goal is consistent with the 2004 Doctor of Nursing Practice (DNP) position statement, which calls for a transformational change in education to prepare nurses practicing at the highest level with expanded scientific knowledge to address quality and outcomes in a complex and changing healthcare environment (American Association of Colleges Nursing [AACN], 2004). Case studies, capstone projects, quality improvement projects, and systematic reviews published in the journal demonstrate the relationship between education and practice and application of The Essentials of Doctoral Education for Advanced Nursing Practice.

The Essentials of Doctoral Education for Advanced Nursing Practice outlines the curricular elements and core foundational competencies for all advanced nursing practice roles (AACN, 2006). Articles published in CSR reflect these foundational competencies:

- Essential I: Scientific Underpinnings for Practice
- Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking
- Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice
- Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care
- Essential V: Health Care Policy for Advocacy in Health Care
- Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes
- Essential VII: Clinical Prevention and Population Health for Improving the Nation’s Health
- Essential VIII: Advanced Nursing Practice

This issue of CSR highlights Essential VI: “Interprofessional Collaboration for Improving Patient Care,” which speaks of DNPs as team members with advanced preparation to facilitate collaboration and overcome barriers to interprofessional practice (AACN, 2006). The current, complex healthcare environment depends on collaboration among “individuals from multiple professions to provide safe, timely, effective, efficient, equitable, and patient centered care” (Institute of Medicine, 2003). The concept of team and the work needed to affect healthcare reform cannot be examined from only one professional perspective. Therefore, the Associate Editors of “Dialogues” and “Restructuring Health Care” invited expert physicians, educators, and doctorally prepared nurses committed to inter-professional education, practice, and clinical innovation to discuss their experiences, strategies, and models for improving healthcare delivery.

I truly appreciate the invited authors’ thoughtful responses to the questions posed. In “Dialogues” Dr. Courtney Reinisch asked Jeffrey Brenner, MD, Executive Director of the Camden Coalition of Healthcare Providers and Medical Director of the Urban Health Institute, “What roles do you see for Advanced Practice Nurses (APN) in the new system?” In the “Restructuring Health Care” section, Paul Shelton, EdD, Senior Research Specialist, Institute for Healthcare Innovation, University of Illinois College of Nursing, speaks to the work of nursing in the “Quest for Effective Care Coordination for the Chronically Ill.” Both experts discuss
the key roles of registered nurses (RN) in the provision and coordination of care. Dr. Brenner acknowledges the work of APNs and discusses strengthening RN and licensed practical nursing programs but seeks information regarding the role of the DNP graduate.

Dr. Brenner's inquiry is not unexpected. The nursing literature has also described the need to clarify the educational curricula and roles of DNP graduates (Melnyk, 2013). The DNP is a degree title, but does not designate the graduate's specialty (AACN, 2006). Graduates are prepared in a variety of nursing practice specialties. It is understandable that the professional community is seeking information about roles and responsibilities of DNP as well as outcomes of the education. It is the responsibility of DNP graduates to educate all healthcare professionals and the public about the roles they are assuming and the outcomes of their efforts. Indeed, all healthcare professionals must educate one another about scope of practice, roles, and responsibilities to develop contextually appropriate models that address the specific needs of populations served.

The editors of CSR are committed to disseminating information about DNP practice specialties, roles, and responsibilities within interprofessional practice and collaboration. To advance this effort a forthcoming issue of CSR will be devoted to comprehensive clinical care. Our objective is to capture the most current and relevant work of students, clinicians, educators, and administrators describing the opportunities and challenges of advancing this effort. We welcome manuscripts regarding comprehensive care delivered by DNP’s including original research, commentaries, systematic reviews, and case studies. Topical areas include

- Education models
- Developing professional practice models
- Interdisciplinary education and practice
- Outcomes of comprehensive care
- Identifying clinical DNP practitioners, including certification
- Compensation for care across settings
- Legal and regulatory implications
- Impact of the Affordable Care Act (ACA)
- Specific populations that benefit from this approach to care delivery
- Other topical ideas should be discussed with the Editor-in-Chief.

We look forward to your participation.

Janice Smolowitz, EdD, DNP-DCC
Editor-in-Chief

References


Restructuring health care to accommodate the Patient Protection and Affordable Care Act (ACA) poses new challenges to health care providers, patients’ families, and members of the community. In this issue of Clinical Scholars Review, the Restructuring Health Care section, four experts examine successful foundational models for improving communication between all health care providers to ensure that adoption and implementation of the ACA happens as optimally as possible.

Drs. Rita Charon and Elizabeth Speakman both write of improved team approaches to deliver better and more efficient health care. Dr. Charon examines narrative medicine as a tool to deconstruct “silos” created to deliver health care. Based on her work, she advocates bringing together medicine, nursing, dentistry, and public health—in an intersubjective, narrative process toward shared power. Dr. Speakman discusses the frequent and often fatal plane crashes during the late 20th century, which led the aviation industry to seriously evaluate causality. Poor communication in the cockpit was identified as the most significant cause. Today, improved communication is once again being called on to save lives. According to Dr. Speakman, “Collective knowledge of the whole is greater than the knowledge of a few.” In essence, we need to know and respect each other’s scope of practice.

Dr. Brenda Zierler asks each reader to participate in specific actions to facilitate health care practices that will alter our new yet ill-defined health care delivery system. She maintains that an informed health care provider in a true yet newly defined team approach will greatly benefit the public.

Dr. Paul Shelton examines transformations in care coordination with nursing at the forefront of models for care involving patients with multiple care conditions (MCCs). Dr. Shelton suggests that nurses should lead the way in creating collaborative, interdisciplinary relationships with other health care providers.

As readers and health care providers, we need to heed the wisdom presented by these four authors. Remaining diligent providers requires keeping up with each new law and guideline amid a changing scope of practice. We then must optimize our respective roles in ways that not only meet the new standards of the ACA but also meet the physical, mental, and social needs of our patients as well.
The literature on interprofessional education and collaborative practice clearly acknowledges that high-functioning health care teams who use effective communication and collective decision-making approaches are better prepared to solve patient care issues and problems. Furthermore, those health care systems that adopt a culture of teamwork are more likely to have a greater impact on patient outcomes. Several reports out of the Institute of Medicine (IOM) note the disaster and potential disaster of “silo practice” and challenge us health care educators and practitioners to create interprofessional opportunities among health care workers (IOM, 1999, 2001, 2003, 2010). Health care has changed significantly in the last 60 years. The evolution of medical and biotechnologies and the proliferation of medication and treatment modalities have all had a positive impact on patients. But along with these medical advances and the specialization and subspecialization and subsequent decentralization of patient care comes the potential for error from the lack of collaboration and communication. It is for these aforementioned reasons that the health care industry has examined the team work approaches that are used in business and industry.

For example, the aviation industry has undergone a major change—one that has allowed us to travel farther and more quickly to destinations people only dreamed of visiting. Like the advances in health care, this has had a positive impact on the lives of people. But with the advent of the jet age in the 1960s and 1970s and the unfortunate subsequent crashes of this era, the airline industry was forced to reexamine how they approached flying. Today, the airline industry replaced individual intelligence (pilot decision making) with team intelligence (the group decisions of the entire crew that is involved in the flight), and as a result, it is now much safer to fly than it was 30 years ago (Gordon, Mendenhall, & O’Connor, 2013). What can we learn from the aviation industry? Today’s health care system is staged to change with the advent of the Patient Protection and Affordable Care Act. We should be able to acknowledge and accept that the collective knowledge of the whole is greater than the knowledge of a few and that interprofessional education and collaborative practice learning opportunities create practitioners who can use team intelligence in decision making. Clearly, students who learn together and have ample of opportunities to engage in collaborative patient care efforts will find working in teams as practicing clinicians customary and natural. In fact, teams that are deliberately formed create an infrastructure and culture of empowerment that gives everyone a voice in the decision-making process (Gordon et al., 2013). Giving students deliberate interprofessional opportunities has the greatest potential to destruct the “silos” currently in place. If we are to truly know what our colleagues do—if one profession is likely to call on the other for their expertise—we need to be aware of each other’s scope of practice. But we also need clinical environments that welcome interprofessional opportunities. We need interprofessional champion clinicians who understand that they need to be part of the positive culture change of tomorrow’s health care system. Collaborating and creating learning and clinical opportunities that foster the collective intelligence of the team leads inherently to better communication and problem solving. This clearly translates into better patient outcomes by efficient and effective targeted care that is deliberate, appropriate, safe, and effective. We as practitioners have to find and create these opportunities for the practitioner of tomorrow to be the best they can be.
References


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The movement toward evidence-based, structurally sound, and patient-centered interprofessional health care is in full swing today. Not a new concept, team-based health care has finally achieved a status beyond the inevitable—it has become desirable.

Many forces have converged to mandate that health care professionals work collaboratively—among them are workforce issues, economies of scale, and the technological complexity of our current diagnostic and therapeutic interventions. Research and training have provided health care professionals and institutions with compass points to guide a massive shift in how health care in the United States is provided (Interprofessional Education Collaborative Expert Panel, 2011). National surveys document the inroads that interprofessional education have made in our academic health centers (Geer, Clay, Blue, Evans, & Garr. 2014). Counting things is not tantamount to knowing that they work, but impressive responses from 127 academic health centers across the country testify to the presence of at least a general introductory training in teamwork.

At Columbia University Medical Center in New York City, with funding from the Josiah Macy, Jr. Foundation, a group of faculty from the dental, medical, nursing, and public health schools convened around a shared commitment to improve health care team effectiveness. The first senior faculty group spent almost a year working closely with one another weekly, not only addressing questions of health care practice and policy but also developing firm trust in and regard for one another. After decades or centuries of a “silo”-built health care system, we knew we had to start by ameliorating the hostilities that separated us and building strong new bridges across the disciplines.

We accomplished just that and were very proud for having done it. Our work from its start was conceptualized not as a group task among health care professionals but as a narrative, intersubjective process. Instead of taking up questions such as who runs the cardiac arrest code or whether the nurse-midwives or the obstetricians have better patient satisfaction or patient outcomes, we took up questions of meaning. We wanted to see one another whole—not in our professional roles but as complex, singular persons doing difficult work they love.

We started with our human responses to stories of persons in trouble. We would read poems or short stories together, watch movie clips, and look at photographs. We wrote a lot and read what we wrote to one another. By relying on the power of narrative, we were able to cast off the distinctions that separated us and see each other as colleagues who shared the same deep commitments that had led us into our professional positions to begin with.

With our collaboration solidly in place, we then recruited students from all four schools to study together. Again, the student seminars were not so much about health care matters because they were about the human predicament of loss and mortality. Our students took up questions of the cultures of health—in individual patients, in patient communities, and in our own disciplines. Students from all four schools worked hard on complex questions and, like the faculty had learned to
do, read and wrote their way toward transparency and real mutual respect and trust.

Interprofessional collaboration can be considered to be a technical, positivist, logic- and date-driven enterprise. It can alternatively be seen as a values-based, emancipatory movement toward shared power (Haddara & Lingard, 2013). Using narrative means to effective, egalitarian, and personal contact promises to do both.

References


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The graying of America, propelled by medical science advances, has resulted in individuals living longer with multiple chronic conditions (MCCs) that are very expensive to manage and treat. In addition, research outlines the significant impact that socioeconomic factors have on health status and longevity, particularly for lower income Americans living with MCCs (Joynt, Orav, & Jha, 2011). A new Commonwealth Fund report states that 80% of physicians indicate that addressing patients’ unmet social needs is as critical as addressing their chronic medical needs (Bacharach, Pfister, Wallis, & Lipson, 2014). Not surprisingly, our current health care system has not provided high-quality care for these patients or addressed their pressing social needs. Changes in the way chronic illness care is delivered have been slow in developing, primarily because of an outdated fee-for-service payment system that rewards duplication of services and specialty care, exceptionally slow adoption of information technology (IT), and a lack of incentives for care coordination (Reuben, 2007).

Federal legislation, through the Patient Protection and Affordable Care Act (PPACA), provides a vehicle to realign incentives to substantially impact and improve service delivery (Blumenthal, 2012) and facilitating adoption of best care practices (Berwick & Hackbarth, 2012). As our health care system struggles with care delivery and payment changes, the needs of persons with MCCs, who account for most annual health care spending, highlight the pressing need for care coordination transformation.

Researchers and clinicians have tested several models to improve the care for adults with MCCs. These models involve primary care physicians, registered nurses (RNs), and other professionals working in collaborative teams with patients to implement evidence-based best practices and provide comprehensive coordinated care. Results provide insight into the evolving nature of care coordination: (a) A strong foundation is needed for successful transformation, especially IT capability; (b) transformation is a long and difficult journey, it requires considerable time and effort; and (c) although approaches to transformation vary, an emphasis on team-based care is essential for expanded access and improved coordination, and data-driven measurement and feedback are the foundation of quality improvement (McNellis, Genevro, & Meyers, 2013; Sinsky et al., 2013).

The results highlight that when RNs are an integral part of the management of the interdisciplinary team, programs have the best opportunity to improve clinical outcomes and impact expenditures through reduced hospitalizations (Feltner et al., 2014; McHugh, Berez, & Small, 2013) and that nursing is critically important in the delivery of high-quality care (Naylor et al., 2013). An Institute of Medicine (2010) report suggests that RNs must practice to the full extent of their education and experience to coordinate increasingly complex care for a wide range of patients, fulfilling their potential as primary care providers by working in collaborative teams focused on the patient’s unique set of needs.

Nursing has been at the forefront of developing and implementing models for persons with MCC. Despite past achievements, new evidence is needed to confirm best practice care coordination strategies that address the PPACA’s triple aim of improving individual health, improving population health, and decreasing health care costs for the Medicare program. It is recommended that nursing take the lead in forming collaborative, interdisciplinary relationships with other health care professions to contribute much needed evidence to the
nations policy debate. For an in-depth examination of the research results and evidence-based framework of care coordination, readers are encouraged to see recent publications by Lamb (2013) and Schraeder and Shelton (2011).

RNs should remain at the center of advancing policy by emphasizing a research agenda investigating the care coordination “black box.” For example, nurses can conduct studies that increase understanding of which high-risk patient population to target that produces cost-effective outcomes; the optimal intervention duration; the most effective type of contacts with patients and team members; the emphasis of care coordination (i.e., assessing, coaching/teaching, monitoring, and evaluating); the mix of components (medical care and social service supports) for optimal joint decision making; the best use of evidence-based self-management protocols combined with effective delivery methods, such as the use of social media and mobile health (mHealth) approaches; development of effective IT tools for patients and the health care team; and how to evaluate and educate the care coordination team in implementing a care coordination intervention.

The Hospital Readmissions Reduction Program, which took effect in October 2012, holds hospitals financially accountable for 30-day hospital readmissions for heart failure, acute myocardial infarction, and pneumonia. Beginning in October 2014, Centers for Medicare and Medicaid Services is increasing the financial penalty and is considering adding more conditions to the readmission mix, including chronic lung disease and elective hip and knee replacements. These financial incentives to reduce rehospitalization rates provide unique opportunities for nursing to influence and contribute research into community-based chronic care management.

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I consider myself a patient-safety researcher and envision my work in interprofessional education (IPE) as one approach to improving the quality and safety of health care. The intended outcome of IPE is collaborative practice. By providing opportunities for students and trainees to learn about, from, and with each other in classroom settings or simulation laboratories using authentic and relevant cases with skilled faculty facilitators, they are better able to understand the similarities and differences in their roles and responsibilities and, most importantly, to appreciate the value added in working together as a team on behalf of a patient or population. If students can transfer IPE competencies (Interprofessional Education Collaborative [IPEC] Expert Panel, 2011) and skills (communication, teamwork, roles and responsibility, and values and ethics of a team) into practice, then future health care teams will function at higher levels and will deliver safer and more cost-effective care. We know that poor or inadequate communication within and across teams causes harm and increases costs (Bower, Campbell, Bojke, & Sibbald, 2003; Davenport, Henderson, Mosca, Khuri, & Mentzer, 2007). Every student is socialized into their own discipline-specific culture with beliefs and assumptions about other professions (not typically experienced but shared by their faculty). The lack of trust, biases, stereotypes, and hierarchy contribute to poor communication and dysfunctional relationships, so addressing these issues through IPE early in training is paramount. The education of health professionals has to keep pace with the changes in the health care system (Frenk et al., 2010; World Health Organization, 2010, 2013). With an increase in access to basic health care and the shortage in the health care workforce, new models of team-based care that include patients and families need to be developed, evaluated, and reimbursed accordingly. Communication and teamwork will be key to meeting the triple aim (Bisognano & Kenney, 2012) of improving the delivery of care and improving the health of the population at a more affordable cost. We cannot sustain the current and broken system and will need to actively work together as interprofessional teams to fix it.

The most important actions the readers could take include the following: (a) Read key articles about health care reform (Bisognano & Kenney, 2012; Patient Protection and Affordable Care Act, 2010) as well as the transformation needed in health professions education to meet the needs of practice—The Lancet Commission Report (Frenk et al., 2010), IPEC Competencies (IPEC, 2011), and RWJF New Careers in Nursing (Institute of Medicine, 2011); (b) inform themselves about the IPEC competencies for collaborative practice (IPEC, 2011) and accreditation standards related to IPE (Commission on Collegiate Nursing Education, 2013; National League for Nursing Accreditation Commission, 2011; Zorek & Raehl, 2013); (c) participate in faculty development programs that focus on IPE-specific skills such as facilitating interprofessional teams, providing feedback, and debriefing after events; (d) model professional behavior that is inclusive of all professions and cultures addressing stereotypes, biases, and assumptions about other professions; and (e) integrate team strategies into current practice environment (situation, background, assessment, and recommendation; team huddles; situational monitoring; and interprofessional team rounding, briefs, or meetings). Each one of us has the responsibility to be change agents for improving health and providing better care at lower and more affordable costs. The current generation of health professions’ students...
understands and supports team-based collaborative care, but existing structures in education and practice, including hierarchy, biases, stereotypes, poor role modeling, and reimbursement models, undermine their efforts to be successful.

References


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The Institute of Medicine, the U.S. Department of Health and Human Services, and the Centers for Medicare and Medicaid are engaged in initiatives to address the escalating population of patients who are living with chronic symptomatic disease. These federal initiatives, escalating costs of care, and the increasing prevalence of chronic disease has prompted an evaluation and analysis of the academic preparation for graduate nurses who will provide care and services to this growing patient population. Graduate nurses represent nursing leadership as clinicians, educators, and researchers. These professionals require the knowledge and skills to meet the burgeoning health care demands of the largest segment of the adult American population. The objective of this systematic review was to identify and summarize the existing evidence that demonstrates the inclusion of chronic disease and its associated management in graduate nursing curriculum. A collaboration of 9 doctoral faculty members representing 5 universities preformed a comprehensive review of the literature over 5 months through the use of multiple databases and several formats of search and MeSH terms. A predefined protocol was developed to reduce bias and included the objectives, inclusion criteria, and exclusion criteria used to guide the review. Findings revealed limitations in current curriculum regarding chronic disease education specifically related to symptom and self-management.

Keywords: chronic disease; symptoms; self-management; graduate nurse education; systematic review
Evaluating Graduate Nursing Education in Chronic Symptomatic Disease

Background

The United States is in the midst of a major demographic shift. In the next four decades, people aged 65 years and older will comprise the largest percentage of the population, and the ratio of people aged 65 years and older compared to people aged 20–64 years will rise by 80% (O’Grady & Wunderlich, 2012). The first of the 80 million baby boomers reached age 65 years in 2011 and are entering into the Medicare system at a rate of 10,000 per day, adding to the already 50 million eligible Medicare beneficiaries (Centers for Medicare and Medicaid [CMS], 2010; see Figure 1).

Chronic diseases have emerged in recent decades as the major cluster of health concerns for Americans (Institutes of Medicine [IOM], 2012). A chronic condition or illness is a condition that is insidious and slow in progression, long in duration, and absent from a spontaneous resolution (CMS, 2010). Chronic diseases often limit the physical functioning, productivity, and quality of life for millions of aging Americans (Anderson, 2010; IOM, 2012). According to the Centers for Disease Control and Prevention (CDC, 2011), chronic diseases currently account for 70% of all deaths. Approximately 48 million Americans report a disability related to a chronic disease (Brault, Hootman, Helmick, Theis, & Armour, 2009), and it is predicted that by 2030, 37 million Americans, or 6 out of 10, will be living with more than one concomitant chronic disease by 2030 (IOM, 2012).

Arthritis is currently the most common cause of disability, affecting about 8.6 million people, followed by back or spine problems (chronic pain), which affect approximately 7.6 million people (CDC, 2011). In addition, cardiac problems impede the functioning of almost 3 million people (Brault et al., 2009). It is predicted that 14 million baby boomers will live with diabetes, and almost half will live with arthritis (expected to hit just more than 26 million in 2020; CMS, 2010). Some chronic diseases may not significantly contribute to mortality, but the associated symptomatology can severely impact on the patient’s quality of life (IOM, 2012). Chronic diseases that are poorly managed contribute to enormous and growing causes of impairment and disability (World Health Organization [WHO], 2009).

Tremendous medical advances over the past century have extended average life expectancies, but these advances have been compromised by parallel increases in physical inactivity, unhealthy eating, obesity, tobacco use, and other chronic disease risk factors (WHO, 2009). As a result of this combination, patients are living longer but with one or more chronic symptomatic disease (CMS, 2010). Regardless of the severity, pattern

![Growing number of Medicare beneficiaries](image_url)

**Figure 1.** Medicare demographics.
of effects, or the duration of a chronic disease, many diseases typically last at least a year, require ongoing medical attention, produce frequent hospital admission and readmission rates, compromise and limit activities of daily living, and impair patients’ perceived quality of life (CMS, 2010; IOM, 2012). In terms of a toll on quality of life, chronic disease morbidity can be assessed along multiple dimensions such as pain, fatigue, physical impairment, lack of sleep, emotional distress, and decreased social health (National Institutes of Health, 2011).

**Objective, Population, Intervention, and Outcomes**

The specific objective used for this systematic review follows: What is the available evidence that suggests the inclusion of chronic disease, symptom management, and self-management content within graduate nursing curriculum? The population, intervention, and outcomes used to formulate the specific question used in this systematic review include the following:

- **Population:** graduate nursing students
- **Intervention:** curriculum content—chronic disease, symptom management, self-management, palliative chronic disease management, knowledge, and clinical competency
- **Outcomes:** knowledge translation into optimal clinical practice and patient care outcomes (reduction in disease exacerbations, reduced hospitalizations, increased physical activity, improved quality of life)

**Methods**

The strategy used to initiate this systematic review was to perform a comprehensive review of the existing literature that was not older than 8 years. The goal was to include comparative studies of any design comparing and evaluating curriculums and to review any primary studies that were selected by the specific search terms. The inclusion of literature reflecting the current national initiatives on the multiple chronic conditions and federally recognized measurements such as patient-centered outcomes were sought. The strategies were unanimously agreed on by the collaborating faculty members.

Publications which were excluded from this systematic review included oncology-related literature, undergraduate nursing education or curriculum...
correlated with the protocol's search terms. The themes that were identified included the following:

- Chronic disease/gerontological nursing
- Palliative care/end-of-life care
- Symptom management
- Self-management
- Nursing theory (this was a newly identified theme)

Two faculty members independently preformed a third review of the 10 publications using the final matrix, the protocol search terms, and the identified themes. From this third review, 4 publications were deleted. The palliative and end-of-life care theme included 3 publications which were deleted because of their primary focus on the End-of-Life Nursing Education Consortium. The 3 publications did not correlate with the search terms and the objective identified within the protocol. In addition, one publication from the United Kingdom with a primary focus on faculty education related to dementia was deleted. A review of the final publications can be identified from the literature matrix (see Table 1).

Because of the brevity of publications that met with the specific criteria of the established protocol, the investigators expanded the inclusion criteria to include case studies, and relevant literature older than 8 years were considered (see Table 1).

**Graduate Nursing Essentials**

Two faculty members independently reviewed the current American Association of Colleges of Nursing (AACN) graduate nursing essentials. This review was used to identify if the essentials that are used to identify educational content in national graduate nursing curriculums included content on chronic disease, symptoms, and self-management. Table 2 provides an overview of the specific graduate nursing AACN essentials and competencies and how they correlate with chronic disease, symptoms, and self-management.

**Discussion and Implications**

The systematic review identified that most of the current publications that address specific graduate nursing curriculum content is predominately focused on end-of-life care where the use of palliative care or symptom management is limited only to the end of life and did not extend this content into the management of symptomatic chronic disease. The investigators initially assumed that this systematic review would identify
<table>
<thead>
<tr>
<th>Database, Source, Author, Year</th>
<th>Type of Evidence</th>
<th>Methods</th>
<th>Sample</th>
<th>Data Collection/Tools</th>
<th>Strengths and Weakness Implications</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINAHL; Nursing Outlook; Kohlenberg, Kennedy-Malone, Crane, &amp; Letvak (2007)</td>
<td>Case studies to include dementia</td>
<td>Evidence-based protocols developed by the university—used as examples of research use</td>
<td>Not applicable</td>
<td>Institutional-based protocols</td>
<td>Describes evidence-based protocols—no specifics; No content on chronic disease or symptom management</td>
<td>Chronic disease; Gerontology</td>
</tr>
<tr>
<td>PubMed; Journal of Professional Nursing; Thornlow, Auerhahn, &amp; Stanley (2006)</td>
<td>Case studies</td>
<td>Nurse practitioner (NP) and clinical nurse specialist competencies for older adult care</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Highlights model case studies for integrating gerontological content throughout APN curricula</td>
<td>Chronic disease; Gerontology</td>
</tr>
<tr>
<td>CINAHL; Medsurg Nursing: Official Journal of the Academy of Medical-Surgical Nurses; Hinch, Murphy, &amp; Lauer, (2005)</td>
<td>Clinical exemplar</td>
<td>Infusion of chronic disease education and specific clinical experiences</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Hospitalist-focused approach to the acute care management of chronic diseases—prevention and episodic care</td>
<td>Chronic disease; Gerontology</td>
</tr>
<tr>
<td>PubMed; Medsurg Nursing: Official Journal of the Academy of Medical-Surgical Nurses; Cranford &amp; King (2011)</td>
<td>Qualitative and quantitative</td>
<td>Examining future NP’s perceptions of fibromyalgia pain, quality of life, and their preparedness to treat this patient population</td>
<td>21 convenience sample—NP students</td>
<td>17-item nonvalidated questionnaire</td>
<td>Understanding of fibromyalgia pain to quality of life; Students not comfortable with managing the disease or its symptoms</td>
<td>Symptom management</td>
</tr>
<tr>
<td>PubMed; Patient Education and Counseling; Williams &amp; Pace (2009)</td>
<td>Integrative literature review</td>
<td>Reviewed literature from 1992 to 2007—no restrictions to the type of research or findings</td>
<td>Yielded 13 publications</td>
<td>Not applicable</td>
<td>Review of the literature exploring problem-based learning as an intervention for enhancing self-management in chronic disease</td>
<td>Patient self-care management</td>
</tr>
<tr>
<td>PubMed; Advances in Nursing Science; Crumbie, Conley, &amp; Burman, (2004)</td>
<td>Literature review</td>
<td>Use of a theory synthesis process for a client-focused approach for APN management of chronic disease</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>The model for promoting process engagement as a theory-driven intervention for chronic disease care</td>
<td>Nursing theory</td>
</tr>
</tbody>
</table>

Note. APN = advanced practice nurse; GU = genitourinary.
significant publications that would be grounded in rigorous research. This review found one mixed method research publication that used a nonvalidated tool for data collection (see Table 1).

Based on the escalating and growing aging demographics of the nation's population and existing federal initiatives, a need exists to

- Develop standardized methods and identify specific content on chronic disease, symptom management, and self-management to include in graduate nursing curriculum.
- Establish a method of evaluation to determine if specific content is being effectively delivered in graduate nursing curriculum.
- Promote and conduct more rigorously designed studies that provide validated and pertinent data.
- Explore the need for continuing education for prior graduate students who may have missed this important educational and clinical content.

**Conclusion**

The investigators of this comprehensive systematic review conclude that a standardized approach does not exist on how best to integrate chronic disease, symptom management, and patient self-care management content into current graduate nursing curriculum. The review revealed a lack of consistency regarding how much time is allocated to this content within graduate nursing curriculum. In light of the escalating predictions of an aging U.S. population who are diagnosed with chronic disease and the current federal initiatives, the systematic review indicates the importance to address chronic symptom disease management in graduate nursing curriculum. The limitations identified in the review are timely as educators academically and clinically prepare graduate nurse providers to care for the ensuing *silver tsunami.*

**References**


**TABLE 2.** American Association of Colleges of Nursing (AACN) Graduate Nursing Essential and Competency Content

<table>
<thead>
<tr>
<th>Search Terms</th>
<th>AACN Essentials DNP/ APRN</th>
<th>ACCN Essentials MSN</th>
<th>AACN Comp CNS Older Adult Care Women's Health</th>
<th>AACN Comp Family CNP Older Adult Women's Health</th>
<th>AACN Comp Adult Gero Acute Care NP</th>
<th>AACN Comp Adult Gero CNS</th>
<th>AACN Comp Adult Gero NP</th>
<th>AACN White Paper Education Role of CNL</th>
</tr>
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<tbody>
<tr>
<td>Chronic disease/illness</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Symptom management</td>
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<td>Self-management</td>
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</tbody>
</table>

Note. DNP = doctor of nursing practice; APRN = advanced practice registered nurse; MSN = master of science in nursing; Comp = competencies; CNS = clinical nurse specialist; CNP = certified nurse practitioner; Gero = gerontology; NP = nurse practitioner; CNL = clinical nurse leader.

Recommended competencies for older adult care for CNSs prepared for women's health/gender specific and across the lifespan populations. Washington, DC: Author.


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The Poster Presentation as Experiential Education: Bridging the Gap Between Research and Practice

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Mary-Jane McEneaney, WHNP, DNP

Columbia University Medical Center

This article discusses student-prepared poster presentations as an educational tool. The poster presentation exercise is often the beginning of in-depth study, which can ultimately lead to mastery of a particular clinical topic, a presentation at a professional meeting, and/or a publication in a professional journal. As a teaching and educational tool, the poster presentation exercise in advanced practice nursing education provides an opportunity for interactive, experiential learning through the process of “learning by doing,” which unifies personal clinical experience with empirical data and didactic course material.

Keywords: poster presentation; experiential education; nurse practitioner education; midwifery education; evidence-based practice

Outcome-based health care demands that clinicians rely on empirical evidence to support and develop best practices. To this end, evidence-based practice is an important aspect of student nurse-midwife and student nurse practitioner education. For example, in addition to their hands-on clinical practice, graduate students in advanced practice nursing programs are trained to critically read research as well as develop and write research proposals.

During their clinical rotations, students are often faced with questions that stimulate critical thinking and demand evidence-based approaches to management:

- Why is this particular diagnostic tool used?
- On what evidence is this practice protocol based?
- Why is this treatment option discussed?

The challenge for students in the health professions is to find ways to use all of the tools they have acquired to develop clinical skills and practices guided by best clinical evidence. These tools include clinical experience, critical evaluation of research, and mastery of didactic course material. The challenge for educators of future health professionals is to provide meaningful and effective learning experiences that provide a foundation for both sound clinical reasoning and evidence-based practice.

The poster presentation exercise is an educational tool that can meet all of these objectives. It is an opportunity for students to develop a question from their clinical rotations, critically review the research related to the question, determine whether or not clinical practice needs to change to better address the issue. The poster presentation exercise is often the beginning of in-depth study, which can ultimately lead to mastery of a particular clinical topic, a presentation at a professional meeting, and/or a publication in a professional journal. Finally, as a teaching and
educational tool, the poster presentation exercise in advanced practice nursing education provides an opportunity for interactive, experiential learning through the process of “learning by doing,” which unifies personal clinical experience with empirical data and didactic course material.

The Poster Presentation: The Process

Columbia University School of Nursing’s graduate program has a master’s level gynecology course that is jointly attended by women’s health nurse practitioner students and nurse-midwifery students. The teaching methodology for this course includes didactic lectures using PowerPoint presentations, reading assignments, small group exercises, and class discussion of clinical topics. The course culminates with the poster presentation assignment as described below:

1. In small groups, choose a topic of clinical relevance that interests you based on an actual clinical experience.
2. Conduct a systematic review of the literature on that topic, focusing on well-designed studies (e.g., randomized control trials, meta-analyses, other systematic reviews).
3. The purpose of the literature review is to provide an evidence-based intervention for a specific clinical condition or for a problem in women’s health service delivery, particularly one that might have various or competing approaches.
   • Examples of poster presentation topics chosen by students in the past include the following:
     “Management of Recurrent Bacterial Vaginosis”
     “Management of Abnormal Uterine Bleeding in Perimenopause”
     “Efficacy of Pelvic Floor Muscle Training for Management of Pelvic Floor Disorders”
4. Create a poster that graphically and succinctly presents your review of the literature, summarizes the evidence, and states your conclusions and recommendations.

Once completed, the poster presentation exercise provides two opportunities for live presentation of the poster itself: one during the class and another at an annual poster session event attended by the larger Columbia School of Nursing community. The presentation includes the clinical question, the available relevant research with a concise summary of each study, a conclusion based on the findings, and a reference section.

The students take turns presenting their individual contributions and then are available for a question-and-answer session that concludes the presentation. Inherent in the process are important aspects of professional development including development of an area of expertise, formal presentation skills, and collaboration across professional specialty areas. Also inherent in the process is student-centered learning, which is the cornerstone of active learning and experiential educational approaches.

The Poster Presentation: Active/Experiential Learning

Contemporary pedagogy holds that there is still a place for the standard lecture in higher education because students themselves report that they rely on lectures to gather the didactic information that will help them to perform well on exams (Machemer & Crawford, 2007; Messineo, Gaither, Bott, & Ritchey, 2007). However, considerable empirical investigation in the fields of educational and cognitive psychology has established that multiple modalities of teaching more successfully engage greater numbers of learners in the learning process and, ultimately, result in broader applications of learning (Bransford, Brown, & Cocking, 1999; Schmidt, Loyens, van Gog, & Paas, 2007). Essentially, interactivity is considered a more effective mode of learning than passivity. More specifically, the classic theories of experiential learning all posit the basic tenet that learning is a function of being personally involved in the learning process—engaged in reflection on actual experience which, in turn, leads to the construction of new knowledge or skills (Dewey, 1938; Kolb, 1984).

Indeed, experiential learning, whereby instructors are facilitators and students are engaged in active, self-directed learning, has been the mainstay of adult education approaches and also of medical education for some time in the form of “problem-based” learning (Savery, 2006). The poster presentation exercise fits nicely into the problem-based, experiential educational paradigm and is also an example of what is termed specifically “project-based learning” (Wurdinger & Carlson, 2010), wherein students choose or are assigned projects through which the learning objectives can be achieved. In fact, the poster presentation exercise adheres to several of the specific principles of experiential education identified by the Association for Experiential Learning (http://www.aee.org/about/whatIsEE):
• Experiential learning occurs when carefully chosen experiences are supported by reflection, critical analysis, and synthesis.

• Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning.

• Learners are engaged intellectually, emotionally, socially, soulfully, and/or physically. This involvement produces a perception that the learning task is authentic.

• The results of the experience are personal and form the basis for future experience and learning.

The posing of a clinical question based on clinical experience, the systematic review of the literature that promotes intellectual and critical reflection, and even the creative immersion in the poster design, and then dissemination of the conclusions, all exemplify the problem- and project-based experiential approach. These same aspects of the poster presentation process also serve to form the basis for evidence-based practice. Furthermore, the process, which culminates in the live presentation of the poster, allows for authentic educational interaction between the students and their peers and between the students and the Columbia University School of Nursing community. Overall, relative to the traditional lecture that offers students primarily passive reception of factual expertise, the poster presentation process is an active and interactive educational tool that engages students in actually becoming the experts.

By stimulating exactly that curiosity, the poster presentation exercise allows students to begin to reflect on their clinical encounters, pose questions based on those encounters, and thoroughly investigate the basis for management and treatment strategies. Moreover, the students are tasked with analyzing the available research that either supports or refutes the aspects of health care in real-time scenarios. As a result, students discover the process of evidence-based inquiry, which leads them to a greater understanding of sound health care and potentially maximizes their own reliance on evidence-based practices.

As is often the case, students also come to understand that there are frequently more questions than answers regarding complex clinical issues and management strategies. In addition, the students often find that a particular clinical question has been pondered but never formally investigated. Sharing such clinical questions and debates in the poster presentation format with peers melds clinical experience with empirical research in an interactive, fluid, intellectually vibrant manner. As with both health care delivery and advanced practice education, the marriage of research and clinical practice is a fundamental goal, and the poster presentation is an exemplary exercise in bridging the gap between research and practice.

Summary

“Tell me and I will forget. Show me and I may remember. Involve me and I will understand.”

—Chinese Proverb

In summary, the poster presentation assignment undertaken annually by the women's health nurse practitioner and nurse-midwifery students at the Columbia School of Nursing is a prime example of both active, experiential learning and bridging the gap between empirical research and clinical practice. The call for evidence-based practice in health care means that advanced practice nurses need both the intellectual curiosity and the critical thinking acumen to be savvy consumers of empirical investigations into clinical problems. By allowing students to reflect on their own clinical experiences; develop their own clinical questions; critically evaluate the evidence; and share their conclusions with classmates, faculty, and the Columbia University School of Nursing community, the poster presentation exercise provides a strong, educational foundation for evidence-based clinical reasoning and practices.

Indeed, the skills learned from the poster presentation assignment guide students as they move from
student to graduate, to clinician, and to clinical scholar. Recent investigations into how best to disseminate the content of a poster presentation to maximize knowledge transfer have been undertaken (Forsyth, Wright, Scherb, & Gaspar, 2010; Illic & Rowe, 2013), and we look forward to incorporating these recommendations into the course assignment in the future. Given its student-centered educational foundation and potential to actively encourage evidence-based practice, the poster presentation should be one of many experiential educational tools used in the advanced practice nursing classroom.

References


Illic, D., & Rowe, N. (2013). What is the evidence that poster presentations are effective in promoting knowledge transfer? A state of the art review. Health Information and Libraries Journal, 30, 4–12.


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The doctor of nursing practice (DNP) degree has gained popularity in the past several years as not only the terminal degree in nursing but also the proposed entry level into practice for advanced practice nursing by 2015 (Chism, 2013). According to Chism (2013), DNP programs have grown at an astounding rate. In fact, the number of DNP programs jumped from 20 in 2006 to 241 in 2013 with an additional 59 in the planning stages (American Colleges of Nursing [AACN], 2014). The number of programs is not the only statistic on the rise. The number of DNP graduates increased from 1,858 in 2012 to 2,443 in 2013 (AACN, 2014). Clearly, advanced practice nurses from various specialty areas are transitioning into DNP roles. Assimilation into these roles can be challenging for the masters of science in nursing (MSN)–prepared nurse because of various internal and external factors. The AACN (2006) outlines competencies that are essential for the DNP-prepared nurse. Using these competencies as well as mentoring, planning, and other strategies for role assimilation can assist the MSN-prepared nurse to transition into the DNP role successfully.

Role Assimilation Defined

To assimilate is to “take in and make a part of your basic knowledge something learned from others, so that you can use it as your own” (Cambridge Dictionaries Online, 2013). For the DNP–prepared nurse, role assimilation is a process one undergoes to make one’s practice unique and to develop a sense of ownership of the role. This role assimilation may be more difficult for the DNP graduate than what was experienced in previous transitions into registered nurse (RN) practice or RN practice into various advanced practice roles. As a DNP, the graduate has an increased ability, as well as additional responsibility, to change nursing practice than was necessary for the MSN role (Dreher & Glasgow, 2011).
Role Changes: From MSN to DNP

The need for parity across the health care team, the Institute of Medicine’s call for safer health care practices, and the need for increased preparation of advanced practice nurses to meet the changing demands of health care validated the need for a practice doctorate in nursing (Chism, 2013). Chinn and Kramer (2011) denoted that the DNP has the potential to strengthen the links between theory, research, and practice to support evidence-based practice (EBP). The DNP is one path to prepare nurses to contribute to the development of nursing knowledge by implementing the science developed by nurse researchers and to develop and integrate nursing practice based on theory. EBP is an essential concept in both the practice and profession of nursing. Chism (2013) indicated that the focus of the DNP is expertise in clinical practice, a necessary component for quality patient outcomes, and the advancement of the profession of nursing as discussed by Patricia Benner (1984). In addition, Dreher and Glasgow (2011) noted that the DNP returns us to the practice roots of our profession and discipline.

DNPs can fulfill various roles including expert clinician, scholar, health care policy advocate, nurse educator, ethical consultant, and nurse executive (Chism, 2013; Dreher & Glasgow, 2011). Other roles exist and will evolve over time. MSN-prepared nurses may fill roles mentioned, and DNP graduates will also move into these roles but in a different capacity. Although many roles or titles held by MSN and DNP graduates within organizations are similar, Dreher and Glasgow (2011) described a clear delineation between the MSN- and DNP-prepared nurse roles. The authors stated “. . . the MSN allows you to be part of the change to improve the quality of patient care you provide, while the DNP equips you to collaborate more interprofessionally . . . to be the change and advance the discipline” (Dreher & Glasgow, 2011, p. 111).

To fully understand role assimilation, it is essential to understand what makes the DNP unique from the MSN-prepared nurse. For example, according to the AACN (2011), the MSN graduate should “integrate nursing and related sciences into the delivery of advanced nursing care . . .” (p.10), whereas the DNP integrates nursing and other sciences to form a basis for the highest level of nursing practice, which includes “developing and evaluating new practice approaches based on nursing theories . . .” (AACN, 2006, p. 9). Obviously, the DNP graduate is prepared to take on roles that epitomize professional practice and “the highest level of leadership in practice and scientific inquiry” (AACN, 2006, p. 7). This is just one example of the difference in role expectations between MSN- and DNP-prepared nurses. These new levels of responsibility and expectations, as well as skill acquisition, may come with challenges because MSN-prepared nurses who likely had developed into experts in their practices will begin as novices as DNP graduates. Benner (1984) related that a nurse who has reached an expert level in their role as a nursing professional can be considered a novice again in the presence of an unfamiliar situation or new role. This transition may be frustrating to those who have so long been mentors, leaders, and trailblazers, and they may now seek out assistance from others to function at a competent level as a DNP.

Role Strain: A Challenge for Role Assimilation

One major challenge nurses face as they move into their respective DNP roles is role strain. Nurses’ roles are influenced by “. . . societal attitudes, governmental policies, and trends in professional issues” (Brookes, Davidson, Daly, & Halcomb, 2007, p. 1). Roles may also be defined by the practice setting in which one is employed. Expectations from these sources may cause conflict and stress for the new DNP graduate. Role strain is “stress associated with expected roles or positions, experienced as frustration” (The Free Dictionary by Farlex, 2013). According to Brookes et al. (2007), role strain occurs from role ambiguity, role conflict, role overload, or role incongruity. Role ambiguity is a type of role strain that occurs when expectations are unclear. For example, a DNP graduate who moves from a role as a nurse practitioner seeing patients on a daily basis to a role as a nurse executive in a group of clinics may be unclear how to impact practice at the point of care while serving in the new capacity. Another form of role strain, role conflict, may be experienced when one’s role holds competing expectations. An example of role conflict is a nurse practitioner seeing patients in a busy clinical setting while also performing nondirect care activities such as collecting data and managing reports. Role overload occurs when resources are insufficient to meet the demands of the role. For example, the nurse executive may be required by an organization or governmental agency to conduct an internal EBP project for which there is a lack of time or fiscal, physical, or human resources to implement. Role incongruity is another form of role stress that occurs when one undergoes role
transition that requires a change in attitudes and values. Role strain, despite which form it may take, can be a challenge for the DNP graduate.

**Strategies for Successful Role Assimilation**

To combat the challenge of role assimilation, the DNP can use various strategies to be successful in transition from the MSN to their new role. Success strategies may include using existing frameworks, models, and theories related to nursing practice, engaging in mentoring relationships, and using self-assessment techniques. Having a plan to incorporate success strategies is beneficial to facilitate role assimilation.

**Using a Framework for Practice**

Using *The Essentials of Doctoral Education for Advanced Nursing Practice* (AACN, 2006) as framework to guide DNP practice is crucial. The AACN (2006) is clear in describing expectations of the DNP-prepared nurse. The AACN describes eight essential competencies for DNP program graduates (see Table 1). The DNP must develop skills in each of these areas to fulfill role expectations. Using this framework, the DNP can highlight new abilities and implement appropriate interventions to create change. Recognizing the key differences in the MSN-prepared nurse and the DNP-prepared nurse is also vital. In each of the eight essential competencies, specific functions are outlined. The DNP must continually review and implement these functions in daily practice, using the guidelines as a living and breathing document to develop practice and assimilate into the role. Through repetition and improved understanding of the framework comes comfort in the new role.

**Understanding Competency Development and Role Transition**

Understanding Benner’s (1984) stages of novice to expert and recognizing individual progress in these stages may also help alleviate anxiety related to assimilation into the DNP role. Benner adapted the concepts of the Dreyfus model of skill acquisition—novice, advanced beginner, competent, proficient, and expert—to the progression of the nurse in professional knowledge development. Furthermore, Benner studied clinical practice in an attempt to discover and describe knowledge in nursing practice, considering both practical (“know how”) and theoretical (“know that”) knowledge. According to Benner, clinical expertise is central to the advancement of nursing practice. Throughout Benner’s discussion, experience is what emerges as the catalyst to move the nurse from one level of knowledge to the next. Benner described experience as the active refinement of preconceived notions and expectations through encounters. Benner, Tanner, and Chesla (2009) noted that theory and practice support one another and only when this happens can true expertise be achieved. Incorporating both practical and theoretical knowledge is essential in developing competency and obtaining expertise in the skills needed by the DNP.

Graduates should not enter into their new roles with expectations that they will be experts immediately. In fact, the DNP graduate may even undergo some of the same stages of reality shock they experienced as a new RN transitioning from student to practitioner. Described by Kramer (1974), the honeymoon, shock and rejection, and recovery phases are adjustment periods those entering practice may undergo as they move through transition from one role into the next. For the DNP graduate, these stages may occur, but relying on past experiences and understanding the stages from novice to expert can help abate negative feelings and allow the graduate DNP to set reasonable expectations of role competency (Zerwech & Garneau, 2012).

**Mentoring**

Finding a mentor to assist in role development is also essential to ease the transition from MSN to DNP.
According to Dreher and Glasgow (2011), mentoring is especially important for the DNP graduate because this is a relatively new role. For DNP, “... mentoring during the early stages of their careers may significantly influence career satisfaction and may guide the development of professional competence” (Dreher & Glasgow, 2011, p. 323). The mentoring relationships sought by the DNP can take many forms; formal, informal, and peer mentoring are just a few types of relationships that may be helpful. Scott (2005) cited that professional mentoring relationships aim to promote career guidance and assist the protégé in navigating through interpersonal challenges. Important considerations in developing an effective mentoring relationship may include individual characteristics, personal and career factors, and the willingness of both parties to engage in the relationship (Young & Perrewé, 2000). Once a mentoring relationship is forged, it is helpful for both parties to develop goals as well as establish consistent dialogue and meetings (Hadidi, Lindquist, & Buckwalter, 2013). Furthermore, Scott (2005) outlined three essential activities for protégés, which are emotional support, career assistance, and role modeling.

**Evidence-Based Practice Models for the New DNP**

DNP graduates may also find it helpful to use EBP models to make decisions in their new roles, which can improve their validity and increase confidence that the right decisions were made based on best evidence, organizational attributes, resources, and other factors. Many models have been identified and used to make practice decisions, and these models can be effective no matter what role in which the DNP serves. Graham, Tetroe, and the KT Theories Research Group (2007) conducted a literature review and found that commonalities exist between many of the models in relation to the steps taken and include problem identification, identification of stakeholders, identification of a research-driven practice change, identification and mitigation of potential barriers, dissemination of information about the change, implementation, evaluation, and identification of activities which will assist in sustaining the change. Clearly, these steps can assist the DNP in decision making in the new role and encourage confidence in role expectations. Various models can be used and include models such as the Stetler, Iowa, and clinical scholar models (Melnyk & Fineout-Overholt, 2011).

**Self-Assessment**

Another way the DNP graduate can facilitate transition and assimilation of the new role is by conducting an accurate self-assessment specific to the new role and also by planning appropriate educational and continuing education activities to enhance areas for development. Self-awareness is essential to the DNP who serves as a leader. According to Chism (2013), “Leaders who possess self-awareness are able to accurately self-assess areas in need of improvement and pursue self-improvement with grace” (p. 40). For example, a DNP graduate who seeks a role as a nurse executive may perform a self-assessment based on duties of the new role and essential competencies outlined by the AACN (2006). The self-assessment may be used to develop a plan for self-improvement, progression through competency stages outlined by Benner (1984), and successful role assimilation not only as a leader in the new individual role but also as an integral part of the health care organization in which one is involved.

**Conclusion**

As the number of DNP programs and graduates expand, it is essential to support DNP role assimilation in practice. Role assimilation for the DNP presents many challenges. Implementing strategies to facilitate assimilation during the transition period is crucial. These strategies include using a framework for DNP practice, understanding role transition and competency development, becoming involved in an effective mentoring relationship, using an EBP model for decision making, and performing a self-assessment. By engaging in these strategies, the DNP can make a smooth transition into the new role.

**References**


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There is little doubt that evidence-based principles have changed the way we think about clinical practice. However, there are challenges to clinical decision making that evidence alone cannot answer. Challenges include realities such as research populations not reflecting “real-world” application, inconsistent adherence to evidence-based principles within clinical practices, sophisticated decision rules overshadowing clinical experience, and gaps in care that impact outcomes. This article attempts first to demonstrate caveats of using and interpreting evidence-based principles and, second, to illustrate common evidence-based concepts which many clinicians misunderstand. These include the cascade effect, common risk difference measures, and predictive values.

**Keywords:** evidence-based practice; clinical decision making; cascade effect; risk ratios; epidemiology; uncertainty

“...There is much variation in the validity of health care–related recommendations and practices that claim to be ‘evidence based.’”

—(Steinberg & Luce, 2005)

**Caveats of Using Evidence**

Many evidence-based strategies used currently that provide clinicians with valuable tools for making decisions were unknown decades ago. Examples include lumpectomy versus mastectomy, HIV treatment, hormone replacement therapy (HRT) concerns, steroids in preterm labor, and beta-blockers in heart failure. Findings that greatly impact health care, however, occur infrequently. Most research results in the medical/nursing arena showing benefit reveal small or even marginal effects. Patients (and clinicians) often are not aware of this (Wyer & Silva, 2009).

Although most clinicians are well aware of the benefits of evidence-based practices, measuring evidence-based outcomes has limitations. Evidence-based practice in its current state “ignores” biochemical, behavioral, or genetic uniqueness (Carr-Hill, 1998). In addition, clinical decisions frequently involve complex factors and usually don’t follow a linear pattern, and there is often geographic variation (Steinberg & Luce, 2005).

The translation of knowledge requires collaboration, ample time, and supportive leaders/stakeholders (Bjork et al., 2013). Converting guidelines into quality measures is difficult because they often contain dozens upon dozens of details yet still have gaps in providing care (Luchins, 2012). This is likely because clinicians are often interested in a single patient and not necessarily a population of representative patients.

Although at least half of all medical treatments have not been validated in clinical practice (Steinberg & Luce, 2005), we must also remember that absence of evidence does not always mean evidence of absence (Altman & Bland, 1995). We cannot say that a treatment, therapy, supplement, or practice is not beneficial because a clinical trial has not been performed that shows benefit. We
can only conclude that there is no evidence to show benefit or disprove benefit. To test and retest large number of tests, treatments, or drugs at different doses and in combinations to evaluate optimal care would be impossible.

Randomized Controlled Trials

Randomized controlled trials (RCTs) are high on the evidence hierarchy as to supporting evidence of interventions. However, the RCT is a simplified experimental design that measures only what can be measured, thus at times, inappropriately reducing the complexity of multifaceted clinical dilemmas (Hudson, Zarifeb, Young, & Wells, 2012). It is also difficult to randomize patients to treatments commonly used in clinical practice but yet unproven or possibly even harmful. RCT results also become outdated, ignored, or remain unsupported in practice (Bjork et al., 2013).

RCTs tend to make recommendations for populations and not individuals. Results tend to support the average patient, but who is average? Also, RCTs often study a single treatment in a homogeneous group of patients. Results are often overgeneralized with results extrapolated to patients being seen in daily practices. It is often difficult to quantify or explain complex patient characteristics and behaviors of patients because of their multidimensional nature and multiple interacting variables of patient characteristics (Wyer & Silva, 2009). Genetics and personalized medicine allow for an imminent trend that will further individualize care (Topol, n.d.), further emphasizing the case for personalized medicine–based practice.

Another caveat is publication bias, which occurs when research results are published based on favorable results. For example, publication bias occurred in early selective serotonin reuptake inhibitor trials for depression (Ahmed, Sutton, & Riley, 2012). As a consequence, studies with negative results are not published. Thus, there is often an overestimation of treatment effects in meta-analyses or systemic reviews. Hopefully moving forward, registries and prospective reviews will help diminish this bias; otherwise, we will have “biased evidence.”

Caveats in Interpreting Research and Making Clinical Decisions

“Probability is uncertainty quantified.”

—Brush (2011)

Studies and diagnostic tests are often flawed; thus, there is usually some degree of uncertainty involved when considering a diagnosis. There are caveats to relying totally on rules and guidelines, and at times, we must rely on heuristics to help guide clinical decisions (Phua & Tan, 2013). Results of tests are often read in the form of a dichotomous outcome such as positive or negative, which sometimes ignores intermediate data. It is important not to underestimate “soft data” (Wyer & Silva, 2009).

Clinicians must take responsibility for understanding testing and probability concepts as well as misconceptions in translation. Study results can be manipulated to make marginal benefits seem considerable. It has been difficult to translate data into practice because we must consider both individual risks and benefits of population-based recommendations. There is also the concern that evidence is subtly influenced by vested interests. The following are examples of three common scenarios exhibiting outcomes which some clinicians have difficulty both interpreting themselves and subsequently translating for patients.

Cascade Effect

Overestimating information from lab data can result in misdiagnosis. For example, we often attempt to decrease our uncertainty by ordering additional tests. This can lead to the cascade effect: “a sequence of events initiated by an initial test, an unexpected test result, or patient or clinician anxiety, resulting in further tests or treatments that may cause unnecessary adverse effects and/or morbidity” (Deyo, 2002). Triggers include lab errors, a misunderstanding of the consequences of false positives, overestimation of benefits and underestimation of risks, and a low tolerance for uncertainty (Deyo, 2002).

When interpreting lab values, it is important to keep in mind that norms are defined as positive/negative—two standard deviations in a healthy population. Thus, if a patient has a single test, there is a 5% chance of a normal result being labeled abnormal; if 6 lab tests are performed, a 26% chance; and with 12 tests, a 46% chance (see Table 1). Thus, when multiple tests are ordered, there is a good chance that at least 1 will be falsely positive and, therefore, a diagnostic workup performed that was unnecessary (Deyo, 2002). This leads to misguided tests or treatments that may cause harm.

Newer technologies are sometimes referred to being oversensitive, identifying salient features which are often clinically meaningless yet yields to additional testing. These subtle abnormalities would likely have been previously unidentified without advanced technology. Although at times these findings are beneficial and even lifesaving, more often this testing potentially leads to adverse events, anxiety, and more false positives (Deyo, 2002).
Richardson

From another perspective, lead-time bias occurs when a test/treatment is initiated early and appears to be beneficial when in reality, there is no benefit in morbidity and mortality in comparison to being diagnosed/treated at a later time. It only appears to be beneficial because diagnosis/treatment occurs earlier, making postdiagnosis/posttreatment period longer and the survival period appear longer. Reliance on surrogate end points has also been shown to lead to improper or unnecessary testing and/or treatment (D'Agostino, 2000), and in some cases, unnecessary care is initiated to avoid medicolegal concerns.

Relative Risk Reduction and Absolute Risk Reduction to Number Needed to Treat

Results of studies can be presented in various and sometimes misleading ways. Understanding of probability, risk expressions, and results can be made clearer depending on how numbers are arranged (Cosmides & Tooby, 1996). Risk differences such as relative risk and absolute risk look at outcome comparison of treatment versus no treatment (baseline or placebo) in reference to study results. Relative risk reduction (RRR) tells us how much a treatment reduces harm (poor outcome) relative to receiving no treatment, whereas absolute risk reduction (ARR) tells us absolute differences in outcomes.

Thus, when the effect sizes of treatment results are reported in terms of RRR, the effect of the treatment is often exaggerated. The ARR, however, provides a more objective clinical value of the treatment. In general, high-risk groups usually benefit most from treatment. On any given day, however, we can never predict the exact probabilities of risk versus benefit in an individual patient.

A simpler way of expressing risk is through number needed to treat (NNT), which is the number representing the number of patients who would need to be treated with one treatment versus another for one to benefit or have a selected outcome (Laupacis, Sackett, & Roberts, 1988). Another point to consider in addition to NNT is the number needed to harm (NNH). Although patients may benefit from a drug or treatment, there is sometimes an associated harm, such as adverse events. For example, say that significant adverse effects occur in 5% of patients taking “Drug A,” our NNH would be 20 (100/5) or the inverse of the ARR; thus, we can inform our patients that for patients taking Drug A, 20 patients would need to take the drug for one to be “harmed.” These concepts are valuable because they are simple to understand, because they are natural frequencies which are easy to understand.

NNH should be weighed against NNT. Both patients and clinicians often consider treatment effects as being more beneficial than they truly are without recognizing that often there may be no individual benefit despite solid evidence of trials showing large beneficial treatment effects (Smeeth, Haines, & Ebrahim, 1999). Again, this is because trials do not take individual physiological, genetic, and psychosocial variation into account.

Examples

Consider having a drug that reduces the risk of stroke from 8% to 3% if taken over a 5-year period. This would give us an RRR of 62.5% (8%−3%/8%). In turn, the ARR is 5% (25%−20%). We then interpret this information to help the patient better understand by translating this to NNT; we divide 100 by the ARR (100/5) to obtain 20. We can then tell the patient that 20 patients would need to take the drug for 1 to benefit over a 5-year period. See Table 2.

To help clarify another point, consider a high-risk patient’s baseline estimated risk for a cardiovascular event to be 25% without treatment and 20% with treatment over a 5-year period. The RRR would then be 20% (25%−20%/25%); the ARR, 5% (25%−20%); and the NNT, 20 (100/5). Now consider another patient that is at lower risk for a cardiovascular event, perhaps 2.5% without treatment. The same treatment used earlier would still produce a 20% RRR but provides a much smaller ARR of 0.5% (2.5%−2.0%), and the NNT would be 200 in the case of the lower risk patient. Thus, the patient at lower risk to begin with has a lesser chance to benefit from the drug than a high-risk patient. Looking at RRR alone, this would not be known.

### Table 1. Probability That a Healthy Person Will Have Abnormal Results in a Biochemical Profile

| Number of tests | Probability of At Least One Abnormal Test, %
<table>
<thead>
<tr>
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<tr>
<td>1</td>
<td>5</td>
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<td>6</td>
<td>26</td>
</tr>
<tr>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>20</td>
<td>64</td>
</tr>
<tr>
<td>100</td>
<td>99.4</td>
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</table>

Understanding Sensitivity, Specificity, and Predictive Values

Clinicians sometimes confuse the probability of a test result given the disease state with the probability of a disease state given results of a test (Brush, 2011). Sensitivity is the ability of a test to detect the presence of a targeted condition, whereas specificity is ability of a test to correctly identify a patient not having a targeted condition when results are negative. Although sensitivity and specificity are useful in the capability of a diagnostic test to predict the presence or absence of a targeted condition, they are not helpful in identifying the proportion of patients with positive tests who have the condition. It is the positive predictive value (PPV) that tells us the proportion of patients testing positive who actually have the condition (Rajul, Mathai, Parikh, Sekhar, & Thomas, 2008). See Table 3.

Bayes’s theorem has been used as a model within clinical practice to help with decision making, taking baseline probabilities of disease processes into account when calculating the probability that a disease is present. It is common for both clinicians and patients to believe that a positive test result for an uncommon condition likely indicates that the patient has the condition. This happens when we ignore the baseline probability of the condition, and subsequently, false-positive results are likely to occur. Thus, even if a test has excellent sensitivity and specificity, if the condition we are testing for is rare, the predictive value will be low. This is concerning if we fail to realize that many of our positive results will be false-positive results, which often occurs when we screen healthy individuals for uncommon conditions. False-positive results frequently lead to the cascade effect as described earlier.

Misunderstanding of probability expression is neither new nor uncommon. For example, in the 1970s, 60 Harvard physicians and medical students were asked the following question:

If a test to detect a disease whose prevalence is 1/1000 has a false positive rate of 5%, what is the chance that a person found to have a positive result actually has the disease, assuming you know nothing about the person’s symptoms or signs? (Casscells, Schoenberger, & Graboys, 1978)

In this study, 18% of the participants gave the correct answer, which is 2%. It is difficult for many to

<table>
<thead>
<tr>
<th>Table 2. RRR/ARR/NNT Example</th>
</tr>
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<tbody>
<tr>
<td>Drug A</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>No stroke</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>RRR</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ARR</td>
</tr>
<tr>
<td>NNT</td>
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</tbody>
</table>

Note. RRR = relative risk reduction; ARR = absolute risk reduction; NNT = number needed to treat.

<table>
<thead>
<tr>
<th>Table 3. Sensitivity and Specificity Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prediction Measure</td>
</tr>
<tr>
<td>Sensitivity</td>
</tr>
<tr>
<td>Specificity</td>
</tr>
<tr>
<td>PPV</td>
</tr>
<tr>
<td>NPV</td>
</tr>
</tbody>
</table>

Note. PPV = positive predictive value; NPV = negative predictive value.
comprehend that false-negative rates and true-positive rates are not complementary probabilities (Brush, 2011). The following is a current example to help better understand test probability expressions.

Mr. A, a 36-year-old male, is having an acute episode of atypical chest pain (CP) and presents to the local emergency room. He has no known risk factors for heart disease. A highly sensitive troponin assay is obtained, which is performed on all patients presenting with symptoms of myocardial infarction (MI). The test reportedly has a sensitivity of 95% and specificity of 90%, assuming a cut-off level of 0.04. The incidence of MI in the group of patients is assumed to be 1%.

- The incidence of MI is 1% in this group of patients.
- The probability of having a positive test given positive MI is 95%.
- The probability of a positive test given no MI is 10%.

What is the probability that this man having a positive troponin level is actually having an MI?

To help understand how to answer this question, a “two-by-two” (2 × 2) contingency table can be set up. It is generally common to use 1,000 patients to simplify the table. Because we are told that the incidence of MI in this group is 1%, we can fill in 9 true positives and 1 false negative to total to 10 patients with MIs (2% total). We then take 1,000 and subtract the 10 MI patients to get 990—the total number of patients without MI. Because we know that the specificity of the test is 90%, we take 90% of 990 to get our true negatives, or 891. To illustrate another point, if we increased the cut-off level to 0.06, we would miss more patients with MI (lower sensitivity) but reduce the number of false positives (increase specificity). See Table 4.

Furthermore, if we performed the earlier testing on only higher risk patients, we would have substantially less false-positive results. Thus, it is key to consider baseline probabilities when performing routine tests (Brush, 2011; Reichlen et al., 2009).

**Patient Perspective**

Although the public tends to equate more testing and better technology with better quality in health care, many new technologies show modest benefits and often are performed in addition to and not instead of current standard testing (Deyo, 2002). We must consider and help patients recognize that newer and more does not necessarily mean better. For instance, patients are usually unaware of cascade effect consequences. Patients deserve and often want to be aware of the effects of potentially unnecessary testing and care. Most likely, they would welcome the opportunity for shared decision making using examples that include simplified statistical terms. This would help patients better understand benefits/risks (Rysavy, 2013).

Information that clinicians share with patients often reflects the clinician’s ethical assessment and interpretation of the evidence. Through better communication and shared decision making, patient preferences can be elicited to help apply evidence which clinicians unveil (Christine & Kaldjian, 2013).

**Linking Uncertainty to Heuristics and Evidence**

Because clinical expertise is experiential in part, it involves more than acquiring and following rules. “Although explicit rules may assist us in making evidence-based decisions, even the most computationally sophisticated application of rules will not insure [sic] good clinical care or identify good clinicians” (Luchins, 2012). Under conditions such as stress, fatigue, or feeling overworked, use of heuristics can ground the decision-making process (Phua & Tan, 2013). Moreover, clinicians need experience, feedback, and various scenarios to link practice and evidence (Gigerenzer & Kurzenhäuser, 2005).

Levine and Bleakley (2012) point out that heuristics can link population-based medicine to patient-based medicine, meshing guidelines with experience, for example, linking beta-blockers in heart failure

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**Table 4.** Contingency Table Showing Positive Predictive Value (PPV) Calculation

<table>
<thead>
<tr>
<th></th>
<th>MI</th>
<th>No MI</th>
<th>Predictive Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive troponin</td>
<td>9 (true positives)</td>
<td>99 (false positives)</td>
<td>$\frac{9}{9} + \frac{99}{1} = 8.0%$</td>
</tr>
<tr>
<td>Negative troponin</td>
<td>1 (false negative)</td>
<td>891 (true negatives)</td>
<td>$\frac{891}{1} + \frac{891}{1} = 99.8%$</td>
</tr>
<tr>
<td>Total patients</td>
<td>10</td>
<td>990</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*Note: MI = myocardial infarction.*
Evidence Principles

( population-based ) with “ don’t treat numbers, treat the patient” ( patient-based; Levine & Bleakley, 2012 ).

Finally, we must also learn to embrace uncertainty and see acceptance of it as a skill which is disclosed in formal education, recognizing that it is often uncertainty that should channel further research. In addition, this allows clinicians to engage patients in discussion disclosing options and recognition that uncertainty underlies competing options ( Wellbery, 2010 ).

Summary

Astute clinicians must be aware of current evidence trends, question the validity, and recognize limitations. Making decisions involves weighing risks and benefits, looking at alternatives, and considering consequences. Knowledge of the cascade effect will help decrease nondiscriminatory testing, and knowledge of potentially overestimating treatment effects by interpreting RRR without consideration of ARR can help decrease misinterpretation. Finally, we must appreciate the influence of prevalence rates when interpreting test results and consider that even a test with great sensitivity and specificity can have a low PPV if the specified condition is uncommon.

High technology preference, perverse financial incentives, and defensive medicine also play a role in triggering unnecessary testing and bias evidence. Clinicians must provide an opportunity for shared decision making with both the patient and family. Finally, as discussed in Richardson ( 2014 ), best practices will likely connect judicious use of heuristics with solid evidence-based principles.

References


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Vitamin D deficiency has become a very contentious issue in the medical community. Inconsistent recommendations from various medical associations as well as lack of good quality rigorous studies further contribute to the confusion. Highly anticipated report by the Institute of Medicine published in 2011 failed to answer critical questions about the role of vitamin D for nonskeletal health. Unanswered questions about the long-term safety and benefits of vitamin D supplementation remain. This article attempts to summarize the existing evidence about vitamin D and provide the reader with information about the appropriateness of vitamin D supplementation for both skeletal and nonskeletal health. Controversy surrounding the issue of establishing the current standards for measuring vitamin D as well as the definitions and cut points for “deficiency” and “insufficiency” of vitamin D are explored. The role of poor health in relationship to vitamin D status is suggested as a possible contributing factor for growing prevalence of vitamin D deficiency.

**Keywords:** vitamin D deficiency; supplementation; optimal level; clinical indications

The magnitude of vitamin D deficiency and the need to take a closer look at this growing health problem in the United States was raised by Forrest and Stuhldreher (2011) who analyzed data from the National Health and Nutrition Examination Survey (NHANES) 2005-2006. The authors concluded that even with the more conservative cutoff point for vitamin D deficiency at 20 ng/ml or less (50 nmol/L), the overall prevalence in U.S. adults was 41.6%, with the highest rate seen in Blacks (82.1%) followed by Hispanics (69.2%). These statistics lends themselves to conclusion that the prevalence of vitamin D deficiency in U.S. adults is far more widespread when considering the higher cut points suggested for optimal skeletal health.

A great amount of research about vitamin D has been amassed within the past decade. This has led to recommendations for supplementation with vitamin D to prevent or perhaps even treat conditions such as cancer, diabetes, depression, and autoimmune diseases. Unfortunately, most of this research did not demonstrate more than associations and does not allow for making specific treatment recommendations at this time. To date, the only proven and established consequences of vitamin D deficiency have been observed in its impact on musculoskeletal health with such conditions as rickets in children and osteomalacia in adults being the classic examples. There are, however, some indications that maintaining adequate levels of vitamin D may be important for prevention of several specific nonskeletal diseases. With the mounting number of publication of studies of variable quality, there have been, therefore, growing concerns about
the long-term safety, optimal doses, and targeted levels for vitamin D supplementation (Institute of Medicine [IOM], 2011).

Prevalence of Vitamin D Deficiency

*Vitamin D deficiency* is a worldwide problem. Multinational study conducted by Lips et al. (2006) demonstrated that 64% of women in 18 countries had vitamin D level lower than 30 ng/ml and 31% had lower than 20 ng/ml. People around the world have different levels of sun exposure. Endogenous production of vitamin D via photosynthesis is lower in countries located far from the equator (Prentice, 2008). It has also been noted that individuals who have lower levels of vitamin D during winter months have more variable average levels of vitamin D throughout the year (Lips et al., 2006).

Increased awareness of skin cancer leads many individuals to avoid sun exposure, which many experts consider to be one of the major reasons for the inadequate vitamin D levels in the population around the world. There appear to be substantial variation in the extent to which humans form vitamin D from exposure to sun. There are individuals who present with inadequate vitamin D levels despite ample sun exposure (Binkley et al., 2007). There are also people who by current standards have vitamin D deficiency but don’t have elevation of parathyroid hormone (PTH) or elevated level of skeletal osteoid volume. This has been specifically noted in individuals with low levels of magnesium needed for proper function of parathyroid gland. On the other hand, there are people who have optimal vitamin D level and have elevated PTH and osteoid volume (Holick et al., 2005; Priemel et al., 2010).

It is plausible to assume that the body may have adjusted to lower levels of vitamin D as people migrated further from the equator. There have also been suggestions that it may not be appropriate to hold everybody to the same standards for vitamin D level. Recent research indicates that African Americans have higher incidence of inadequate vitamin D compared to other Americans. It is also becoming apparent that most blacks living in North America do not achieve optimal serum vitamin D at any point during the year, yet statistically they continue to have much lower rates of osteoporotic fractures. This phenomenon may be partially a result of adaptations causing an intestinal resistance to 1,25-dihydroxyvitamin D (1,25(OH)D) in addition to the resistance of skeleton to the PTH (Harris, 2006).

### Vitamin D: The Definition, Pharmacokinetics, and Pharmacodynamics

Vitamin D plays a crucial role in the homeostasis of calcium and phosphate. Vitamin D does so by interacting with “intracellular receptors that regulate gene transcription and thereby stimulates intestinal absorption of calcium and enterocyte differentiation, regulate osteoblast and hematopoietic-cell functions, and suppress the activity of the parathyroid gland” (Haddad, 1992, p. 1213). Elevation of PTH known as secondary hyperparathyroidism (PTH levels higher than 65 ng/ml) is a consequence of vitamin D deficiency and is associated with calcium malabsorption, inappropriate bone mineralization, muscular weakness, poor growth, and increased rates of fractures (Haddad, 1992). Rickets seen in children and osteomalacia seen in adults are the two most well-known manifestation of vitamin D deficiency. Excess vitamin D leads to hypercalcemia, extraskeletal calcifications, hypercalciuria, stones in the urinary tract, kidneys, and other organ malfunction (Haddad, 1992; Holick, 2007).

Besides these well-researched clinical conditions, it has been suggested that low vitamin D levels may be associated with diabetes mellitus, hypertension, depression, cancer, and several other diseases (Looker et al., 2011). This has led many clinicians to prescribe vitamin D for their patients in an attempt to normalize serum vitamin D level. It is hoped that by raising vitamin D to the “optimal level,” the disease of concern can be either prevented or improved. According to the most recent report by IOM (2011), as of now, there is very little evidence to support supplementation with vitamin D for nonskeletal conditions. Furthermore, it is imperative that clinicians exercise caution when making decisions about suggesting vitamin supplementation. In recent years, there have been several attempts to investigate isolated vitamin supplementation as a means of prevention for several serious conditions. It took several years before randomized clinical controlled trials indicated that supplementation with beta-carotene in current smokers results in increased rates of lung cancer (Tanveyananon & Bepler, 2008). There is also an increasing amount of evidence linking excessive supplementation with folic acid to colorectal cancer in certain individuals (Luebeck, Moologavkar, Liu, Boynton, & Ulrich, 2008).

Vitamin D exists in two forms: D2 (ergocalciferol) and vitamin D3 (cholecalciferol). In presence of ultraviolet radiation, 7-dehydrocholesterol is transformed in the skin into vitamin D3. Food such as cod liver oil, salmon, and egg yolk are additional sources of vitamin
D3 (Heaney, Davies, Chen, Holick, & Barger-Lux, 2003). Vitamin D2 is obtained only from food sources. Subsequent hydroxylation reactions of biologically inactive vitamins D2 and D3 in the liver and kidney is required to form 1,25(OH)D (calcitriol)—the biologically active metabolite of vitamin D (Planton, Meyer, & Edlund, 2011). Both precursors are interchangeable in their capacity to form the active hormone. The active form of vitamin D, 1,25(OH)2D, affects local tissue through its receptors, which are present on numerous tissues and control more than 200 genes. Some of the genes regulate cellular differentiation and proliferation; others are responsible for angiogenesis and cell apoptosis (Holick et al., 2008). The population data from the NHANES III study indicate that the combined average intake of vitamin D from dietary sources and supplements ranges from 250 to 300 IU per day. This suggests that food is not a good source of vitamin D and that humans were designed to obtain vitamin D from sun exposure rather than food (Yetley, 2008). Therefore, until very recently, the human gastrointestinal tract has never been exposed to the doses of vitamin D that range from several thousand IU to 50,000 IU in a single dose. This alone should pose caution about supplementing with large doses of vitamin D. Furthermore, there are currently no longitudinal studies assessing the intake of high doses of vitamin D. Even supplementing with higher daily doses doesn’t seem to be risk-free, and there are indications pointing to possible adverse health effects (IOM, 2011).

Supplementation is, however, warranted in instances where frank vitamin D deficiency has been established to preserve skeletal health. Two forms of vitamin D are available for supplementation in clinical practice. Until recently it was thought that both vitamins D2 and D3 are equally effective (Holick et al., 2008). More recent studies suggest that vitamin D3 may be more effective in achieving desired plasma serum concentration (Binkley et al., 2011; Heaney, Recker, Grote, Horst, & Armas, 2011; Tripkovic et al., 2012).

**Vitamin D and Clinical Practice**

In an effort to help clinicians guide their practice, the IOM, issued the report on dietary reference intakes (DRIs) for calcium and vitamin D in 2011. This report reflects the most current and up-to-date evidence about the effect of supplemental vitamin D on the human body. The final recommendations addressed solely the intake and concentration of 25-hydroxyvitamin D (25[OH] D) necessary to assure adequate skeletal health. It stated “that in the panel’s judgment, there was insufficient evidence to make any recommendations with respect to nonskeletal benefits” (IOM, 2011, p. 57). The committee further concluded that information about the health benefits beyond bone health were from studies that provided mixed and inconclusive results and could not be considered reliable (IOM, 2011). Some groups have issued statements opposing the IOM conclusions calling them illogical (Heaney & Holick, 2011).

According to the IOM (2011), “a serum concentration of 20 ng/ml is sufficient for 97% of the population, including bone health as the main endpoint” (p. 56). Previous studies, however, indicate that levels of vitamin D lower than 31 ng/ml increase level of PTH as well as osteoid volume and are not sufficient for bone health (Chapuy, 1997; Priemel et al., 2010). This has become one of the strongest arguments for suggesting higher serum levels of vitamin D for achieving optimal skeletal health.

Given the disagreement about the optimal level of vitamin D, questions regarding the appropriate methods for evaluating vitamin D status have also been raised. Current laboratory standards use serum 25(OH)D to measure vitamin D status. However, there are many metabolites of vitamin D, and at this time, it is not known whether any of these other forms show 1,25(OH)D physiological effect. Therefore, it is quite possible that our contemporary understanding of vitamin D is as limited as our understanding of correlation between lipids and coronary artery disease was years ago. At that time, sufficient data about the roles of HDL, LDL, and triglycerides was not available (Binkley, 2012). This might be yet another reason for more conservative approach to vitamin D supplementation.

**Setting the “Optimal Level” for Vitamin D**

What is the adequate optimal level of vitamin D and how has it been set? The laboratory measures of vitamin D deficiency have not been determined by rigorous studies, and there was no united agreement as to what levels should be considered as a gold standard. Therefore, depending on the laboratory where an individual is being tested, he or she might be considered to be vitamin D deficient or insufficient. The term insufficiency is frequently used for milder forms of vitamin D deficiency.

Because many laboratories seem to be using cut points exceeding the last recommendations set by IOM (2011), it is arguable if vitamin D deficiency is as prevalent
as many researchers believe. It is generally agreed that plasma vitamin 25(OH)D level lower 12 ng/ml is considered deficiency. Disagreement exists about the level of so-called insufficiency that ranges between 20 and 30 ng/ml. The measurement of 25(OH)D in plasma is also challenging, and standardization is lacking (Holick, Binkley, Lensmeyer, & Bendich, 2010). The test results can differ from one method to another, but what is more disturbing is that variability can be seen even among versions of the same method and among individual laboratories (Hathcock, Shao, Vieth, & Heaney, 2007, Looker et al., 2011). There are several theories on how the optimal level for vitamin D should be set. One of the most prevalent theories that gained popularity is based on the evolution. This theory draws from the fact that in the course of evolution, human beings were fully exposed to the sun (Vieth, 2004). This suggests that looking at the serum vitamin D levels of chronically sun-exposed individuals such as outdoor workers, tanners, and surfers might be a good starting point (Barger-Lux & Heaney, 2002; Binkley et al., 2007; Tangpricha et al., 2004). The calculated mean value for these three groups is 36 ng/ml (Binkley, 2012). A landmark study by Luxwolda, Kuipers, Kema, Dijck-Brouwer, and Muskiet published in January 2012 looked at two indigenous tribes living in East Africa. They both live 2°–4° south of the equator in Tanzania as traditional hunter gatherers and neither uses sunscreen. Their serum 25(OH)D was averaging at 46 ng/ml (Luxwolda et al., 2012). Based on these studies, it would seem reasonable to aim for the range of 30–50 ng/ml.

**Inadequate Vitamin D Level and Chronic Illnesses**

In most cases, the evidence that links low levels of vitamin D to numerous chronic illnesses is based on observational and epidemiological studies (Holick, 2007). The ability to measure vitamin D level has not become widely available until the past 20 years. It is therefore very difficult if not impossible to predict to what extent vitamin D deficiency has been present among the population and the effect it might have had. The results of the NHANES study offer more insight into the understanding of the current growing prevalence of inadequate levels of serum vitamin D.

A study by Looker et al. (2008) looked at the U.S. population’s serum 25(OH)D in 1988–1994 and compared it with that in 2000–2004. They found that in 2000–2004, the mean serum 25(OH)D was lower. The authors concluded that in adults, the “combined changes in BMI, milk intake, and the use of sun protection appeared to contribute to real decline in vitamin D status” (Looker et al., 2008, p. 1526).

The correlation between obesity and variety of chronic illnesses has also been documented. Obese individuals have been shown to be prone to lower serum vitamin 25(OH)D concentration compared to those of normal weight (Hypponen & Power, 2007; Prentice, 2008). Differences in lifestyle certainly play significant role, but increasing evidence suggests that vitamin D being fat soluble is more likely to be absorbed and stored by adipose tissue (Looker, 2005). Unfortunately at this time, it is not known to what extent adipose tissue functions as a storage form for vitamin D and thus reduces its bioavailability (Scientific Advisory Committee on Nutrition, 2007). It is quite plausible that all the detrimental effects of sedentary lifestyle, unhealthy diet, and excessive stores of adipose tissue are the major causative factor for number of chronic illnesses associated with inadequate levels of vitamin D and that the low level of vitamin D is a mere consequence. In this case, inadequate levels of vitamin D could be viewed as a marker of poor health rather than causative agent. It is unlikely that optimizing vitamin D levels will become a magic bullet making up for the unhealthy lifestyle.

There are, however, several disease states that have been shown to benefit from optimizing levels of vitamin D. Cauley et al. (2008) demonstrated increased risk of hip fractures in vitamin D deficient individuals. As stated, however, in generally unhealthy individuals, it could simply be a sign of poor health. Randomized controlled trial by Lappe, Travers-Gustafson, Davies, Recker, and Heaney (2007) showed that supplementation with vitamin D leads to reduction in cancer risk among postmenopausal women. Meta-analysis by Murad et al. (2011) found that vitamin D used along with calcium reduces the risk of falls in the older adults, and there is limited data that points out to the link between vitamin D and improved muscle strength in patients with myopathy (Boonen et al., 2006). However, very little is still known about the effect of vitamin D, and unrestrained supplementation should therefore be avoided. In a randomized controlled trial by Sanders et al. (2010), single oral dose of cholecalciferol 500,000 IU was administered to older women. This high dose of vitamin D lead to increase in falls and fractures in these older women.

**Clinical Implications**

It is estimated that daily intake of 1,000 IU of vitamin D3 increases circulating 25(OH)D by approximately 6–7 ng/ml (Heaney & Layman, 2008). It appears that
higher increases in 25(OH)D are seen in patients with initially lower levels of vitamin D. There also appears to be significant interpersonal variability in response to equal doses of vitamin D. The causes for this differential response are likely because of differences in gastrointestinal absorption of vitamin D and differences in metabolism. The precise mechanism(s) remain to be defined (Binkley et al., 2011).

The 2011 IOM report recommends daily vitamin D3 dose of 600 IU for individuals 1–70 years old and 800 IU from 71 years old. Of note is that this recommendation is considered by many experts illogical given the different physiological needs of a growing child, mature adult, and older adult. It is also noteworthy that no other nutrient has the same daily recommendation for such a wide age group. The 600 IU of vitamin D3 suggested by IOM is designed to maintain 25(OH)D at the level of 20 ng/ml, which is deemed sufficient. For the purpose of maintaining healthy bones, however, the Endocrine Society suggests supplementation with 1,500–2,000 IU daily, which will maintain 25(OH)D level higher than 30 ng/ml (Holick et al., 2011).

Although these are two quite different recommendations, it is important to recognize that IOM addresses general population and therefore maintains a more conservative approach. Clinicians treat individual patients and have the benefit of close monitoring. This allows for more liberty in adjusting doses of medications or supplements based on the individual patient’s needs.

One of the effective ways for replenishing 25(OH)D in persons with vitamin D deficiency suggests 50,000 IU of oral ergocalciferol once a week for 8 weeks and remeasuring upon completion of the course. If vitamin D at that time continues to be lower than the minimum level, supplementation should continue for another 8 weeks. If vitamin D level continue to be low at the end of second course, it is necessary to investigate the adherence with prescribed therapy. Malabsorption should be suspected if noncompliance is ruled out, and referral to gastroenterologist is recommended. To maintain an optimal level of vitamin D after repletion is completed, daily intake of 800–1,000 IU of vitamin D3 from dietary sources and supplements is recommended (Holick, 2006; Holick, 2007).

Conclusion

Vitamin D deficiency is common. Currently, there is no consensus on the appropriate level of 25(OH)D. The 2011 report issued by the IOM concluded that 20 ng/ml is a safe and sufficient level for 97% of the population to maintain adequate bone health. To maintain this serum level, the IOM recommends daily administration of 600 IU of vitamin D3 or D2 for ages 1–70 years. The IOM did not find enough evidence to support the use of vitamin D for extraskeletal benefit (IOM, 2011). Numerous groups including the Endocrine Society have issued statements opposing the recommendations of IOM. To optimize the bone health, the Endocrine Society recommends level of vitamin 25(OH)D higher than 30 ng/ml. Daily doses of 1,000–2,000 IU of vitamin D3 are suggested to maintain this serum concentration (Holick et al., 2011). Studies on chronically sun-exposed individuals as well as traditional hunter gatherers from East Africa indicate that it is reasonable to assume that human beings are designed to maintain vitamin 25(OH)D at 30–50 ng/ml. It is essential to keep in mind that interpersonal differences are common and not all individuals may need the same amount of supplementation. Vitamin D3 has been shown to be more efficacious in raising and maintaining level of 25(OH)D (Binkley et al., 2011; Heaney et al., 2011; Tripkovic et al., 2012). Benefits of vitamin D beyond skeletal health are not well-established at this time, but emerging research indicates that assuring adequate level of vitamin D may have benefits beyond skeletal health (Cauley et al., 2008; Lappe et al., 2007). Further research should focus on investigating the direct relationship between vitamin D and specific disease states to increase our understanding of the role that vitamin D plays in preserving the optimal state of health.

References


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Improving Provider Compliance in the Use of an Asthma Action Plan for Patients With Asthma in an Outpatient Setting

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**Problem:** Improved patient asthma outcomes have been demonstrated through the use of a symptom-based written asthma action plan (AAP) in reducing acute care visits (Gibson & Powell, 2004). However, despite the research and guideline recommendations that support the use of AAPs, these plans are routinely not used by providers. The aim of this quality improvement (QI) project was to improve provider compliance in the use of a symptom-based AAP. **Methods:** A QI project was conducted in an outpatient setting involving an educational in-service on the use of an AAP. A retrospective medical record review was conducted following an educational in-service to assess the use and completeness of the AAP ($N = 42$). The rate of proportional change in compliance in the use of an AAP after the educational in-service and system procedural change was analyzed and reported. **Results:** A statistically significant improvement in provider compliance to the use and completion of a symptom-based AAP was found at 8 weeks following an educational in-service and system procedural change. **Discussion:** This QI project demonstrated the effectiveness of an educational in-service in improving provider compliance in the use of and the completion of a symptom-based AAP.

**Keywords:** written asthma action plans; symptom-based asthma action plans; asthma education; asthma barriers; asthma guidelines; evidence-based asthma management

Despite advances in new medications, medical technology, and research findings, asthma continues to pose a considerable burden on health outcomes. Asthma is the most prevalent noncommunicable disease in childhood according to the World Health Organization (2013) and has the distinction of being the only treatable chronic disease in the United States that is also increasing in morbidity and mortality (Lane, Newman, Edwards, & Blaisdell, 2006). The Agency for Healthcare Research and Quality (AHRQ) reports that asthma affects 16 million adults and 6.1 million children and accounts for 2 million emergency department (ED) visits annually in the United States. In light of the high prevalence of asthma, inconsistencies in standards of care, burden of asthma, and other socioeconomic factors, the Institute of Medicine (IOM, 2011) designated quality improvement in asthma as a priority area.
Asthma is a chronic disease characterized by airway inflammation and intermittent or acute expiratory airway obstruction in response to various stimuli (Fitzgerald & Shahidi, 2010; Gibson & Powell, 2004). The inflammation of asthma with variable airway obstruction, which is usually reversible, can lead to recurrent episodes or exacerbations of wheezing, breathlessness, chest tightness, and cough. Many patients do not recognize the symptoms of an impending asthma exacerbation, such as chest tightness, nocturnal awakenings, cough, wheeze, or decreased activity level. Most often, these symptoms occur gradually over several days and offer an opportunity for timely intervention with beta-agonists and corticosteroids which help to reduce airflow obstruction and the severity of an exacerbation (Fitzgerald & Shahidi, 2010; Gibson & Powell, 2004).

Evidence-Based Practice Guidelines
Recognizing the inconsistencies and need for improvement in managing asthma, the National Heart, Blood, and Lung Institute’s National Asthma Education and Prevention Program (NAEPP) was developed as a national guideline for the diagnosis, treatment, and management of asthma. The guidelines, developed through research and evidence-based findings, emphasize the implementation of an individualized written asthma action plan (AAP; see Appendix) for all patients with asthma (Bhogal, Zemek, & Ducharme, 2006; Fitzgerald & Shahidi, 2010; NAEPP, 2007; Rank, Volcheck, Li, Patel, & Lim, 2008). The AAP is a set of prescribed instructions that assists patients in the early recognition and provides directions as to what steps to take in the treatment of an exacerbation. Effective asthma education on the use of an individualized AAP enables patients and caregivers to understand the importance of reducing trigger exposure, to recognize the signs and symptoms of asthma exacerbation, and to recognize when to step up or step down controller therapy (Ellis, 2009; Gibson & Powell, 2004; Rank et al., 2008). This is especially important in maintaining control and with asthma exacerbations in the use of inhaled corticosteroid (ICS) and oral corticosteroid (OCS; Gibson & Powell, 2004). Research has linked improved asthma outcomes, operationally defined as reduced hospitalizations, ED visits, and outpatient visits for asthma exacerbations; fewer missed days from school and work; and less nocturnal awakenings, with the use of an AAP (Gibson & Powell, 2004; NAEPP, 2007; Teach, Crain, Quint, Hylan, & Joseph, 2006; Zemek, Bhogal, & Ducharme, 2008).

Barriers to the Use of an AAP
Despite the guideline recommendations, AAPs are not routinely used by providers, and only 25%–56% of patients receive an AAP (Rank et al., 2008). In a survey given to 196 locations in family practice, internal medicine, pulmonologists, allergist offices, and hospitals covering 24 states in the United States, Cooper et al. (2010) reported that only 63 offices provided an AAP to their patients with asthma. Also from the survey findings, Cooper et al. assert that only 32% of health care practitioners use the guideline-recommended AAPs.

Reasons and barriers cited for provider noncompliance to the use of an AAP are provider lack of awareness and knowledge of the guideline or disagreement with the guideline, lack of time, lack of self-efficacy, lack of specific educational training and knowledge, and belief that the AAP will not be useful to patients (Cabana et al., 1999; Partridge, 2004; Roberts et al., 2009). Contrary to some of these beliefs, Braganza and Sharif (2010) found that most parents post their children's AAPs for easy reference or retrieval from a safe place, such as on the kitchen refrigerator. Braganza and Sharif interviewed 428 subjects, reviewed 2,192 charts, and reported that 80% of parents of patients with an AAP perceived that AAPs were extremely useful. When the child was sick or medication was needed to be given, 55% of the parents reported looking at the AAP for guidance.

Quality Improvement Project Purpose and Design
Quality improvement (QI) is a process where individuals collaboratively work together to bring about improvements in outcomes (Newhouse, 2007). A QI project was developed to address and improve provider compliance in the completion and use of an AAP. Provider education is one of the main QI strategies employed in the Closing the Quality Gap series as reported by the IOM (2011). Strategies that have been found to be effective in promoting behavioral change among health professionals include in-services, reminders or boosts, academic detailing, and multifaceted interventions, such as audits and feedback (DiCenso, Guyatt, & Ciliska, 2005; O’Laughlen, Hollen, & Ting, 2009). The QI project was designed to improve compliance in the documentation and use of a symptom-based AAP in an outpatient setting by using an educational intervention for both the office medical assistant staff and providers.

The QI project involved the development and implementation of an educational in-service on the use of an AAP and a system procedural change (placing
a blank AAP on each patient’s medical record at the time of visit). Education was directed toward increasing provider and office staff understanding of the need for patient empowerment through self-management in the control of their asthma symptoms through the use of an individualized symptom-based AAP and how to complete an AAP. A measure of the change in provider compliance rate in the use of an AAP was analyzed before versus after an educational intervention provided by a nurse practitioner project investigator. Provider compliance was operationally defined as a 100% completed copy of an AAP on eligible medical records.

**Setting and Sampling Approach**

The QI project was conducted in a suburban outpatient allergy and asthma clinic in the Baltimore, Maryland, metropolitan area during an 8-week period, culminating in 2011. Inclusion criteria for eligible medical record review included all active or new patients \( (N = 42) \) diagnosed with asthma, aged 6 years and older, and who received treatment in the office for their asthma during the project period. Medical records during the 8-week project period were cross-referenced from the patient schedule and were determined eligible through the following criteria: (a) documented asthma diagnosis, (b) presence of airway reversibility of greater than 12%, or (c) the use of ICS in applicable patient medical records. Medical records with AAPs from those asthma patients seen by the nurse practitioner project investigator were excluded from data collection in the study to reduce bias. There were 162 patient medical records reviewed, and of these, 42 medical records met the inclusion criteria eligibility.

**Procedures**

Following institutional review board (IRB) review, this QI project was conducted in two phases: development and implementation. In the development phase, an educational in-service and data collection tool were designed and reviewed with staff for input or changes. In the implementation phase, an educational in-service was given to two health care providers, (one physician and one nurse practitioner), one office manager, and two medical assistant staff on the application, steps, and intended use involved in the appropriate completion of an AAP. Key components of the educational in-service included (a) purpose of the project, (b) background and significance of using an AAP, (c) role and expectations that providers and office staff play in the system procedural change (e.g., placing a blank AAP in all eligible asthma patients’ medical record at the time of the office visit and photocopying once it is completed for medical record), (d) instructions on how to complete the AAP, and (e) what patient education needs to be done, be documented, and by whom.

**Variables and Measures**

A medical record review tool was developed to record data and variables when performing the medical record review. The effectiveness of the educational intervention was measured through assessment of the outcome variable—provider compliance in the use of a completed AAP. The independent variable was the educational intervention given to the health care providers and office staff on the use of the AAP through an initial in-service and then followed by face-to-face meetings, posted samples of AAPs, and electronic messaging (e-mail or texting) reminders and the initial placement of the blank AAP form in eligible medical records. The outcome, or dependent variable, provider compliance was operationally defined and measured through evaluation of the presence of an appropriately completed AAP on all eligible medical records during the study period.

**Data Collection**

Patient demographic and provider compliance data was collected via a medical record review tool by the nurse practitioner investigator. Verification of provider use and patient receipt of the AAP was assessed by the presence of a fully completed copy of an AAP as defined by the Green, Yellow, and Red Zones with prescribed medication, dose, route, and frequency in all eligible medical records. Data was collected on site via the data collection tool and compared using a medical record review tool to collect data and assess provider compliance rate as measured by the presence of a completed AAP on an asthma patient’s medical record.

**Data Analysis**

Statistical analysis in Statistical Package for the Social Sciences (SPSS version 18) was conducted using descriptive and frequency analyses of continuous, nominal, and dichotomous data. The proportion of eligible medical records with and without fully completed AAPs was analyzed and examined for rate change. The rate of proportional change (percentages) in compliance in the use of an AAP after the educational in-service
was analyzed and reported. The proportion of patients with a fully completed AAP on the medical record was compared before and after the educational intervention using the McNemar test. The McNemar test was used to test differences in proportions for dependent groups in a $2 \times 2$ within-subjects design to measure changes in rates of provider compliance of the AAP.

**Results**

Out of 162 medical records retrospectively reviewed during the project’s 8-week implementation period, 42 patients met inclusion criteria. Several young patients with asthma had an AAP on their medical record but were not counted in the retrospective review because they did not meet the eligibility criteria, for example, because of the age restriction of having to be older than 6 years. Most patients were female (64%), with asthma as their primary diagnosis (86%), had commercial or private insurance (79%), and a mean age of 37 years ($\pm SD = 20.8$, range 6–70 years). The average number of visits per patient was 1.7 ($SD = 0.7$). Of the 33 AAP on the eligible medical records, all sections (Green, Yellow, and Red Zones) of the AAP were 100% fully completed (Table 1). Two patients (<5.0%) had an AAP prior to the educational intervention and system change, whereas 33 patients (78.6%) had an AAP following the educational intervention ($p < .001$; Table 2). Results were reviewed and assessed for translation and evaluation of provider compliance to the procedural change. A statistically significant change ($p < .001$) in provider compliance was found as evidenced by a 78.6% (33 out of 42) increase in the use and completion of a symptom-based AAP following the intervention (education and system procedural change) as compared to less than 5.0% (2 out of 42) rate of compliance prior to the intervention.

**Discussion**

With an educational intervention and system procedural change focused on the national guideline recommendations in asthma management in the use of and completion of AAPs, the project demonstrated that education with system changes increases provider compliance in the use of symptom-based AAPs. There was a statistically significant ($p < .001$) improvement in provider compliance (as measured by change in percentage) in the use and completion of an AAP, pre- and post-educational intervention and system procedural change. This project demonstrated an improved completion and use of the AAP at the outpatient office. It is expected that the office will benefit from the structured use of the AAP because an increased use in the AAP will ultimately improve patient outcomes. The specific data collected in this QI project will help the outpatient office demonstrate provider compliance in this important and useful tool. Another future QI project is needed that targets the AAP and measures improvements in asthma outcomes and patient satisfaction in patients with an AAP.

**Strengths and Limitations of Data**

A noted strength of this QI project is the integration of evidence-based practice (EBP), national guidelines, and systematic reviews to bring about change in provider practice. To enhance the reliability and validity of the review tool, categorical variables of yes/no were operationally defined as “yes,” copy of an AAP is present

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**TABLE 1.** Characteristics of Asthma Action Plan (AAP) of Eligible Patients/Medical Records ($N = 42$)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± standard deviation, range</td>
<td>37 ± 20.8, 6–70 years</td>
</tr>
<tr>
<td>Number of visits, mean ± standard deviation, range</td>
<td>1.71 ± 0.7, 1–3</td>
</tr>
<tr>
<td>Sex, $n$ (%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>27 (64)</td>
</tr>
<tr>
<td>Male</td>
<td>15 (36)</td>
</tr>
<tr>
<td>Diagnosis, $n$ (%)</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>36 (86)</td>
</tr>
<tr>
<td>Asthma/COPD (combined)</td>
<td>6 (14)</td>
</tr>
<tr>
<td>Primary insurance, $n$ (%)</td>
<td></td>
</tr>
<tr>
<td>Commercial/private</td>
<td>33 (79)</td>
</tr>
<tr>
<td>Medicare</td>
<td>6 (14)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>3 (7)</td>
</tr>
<tr>
<td>AAP fully completed, $n$ (%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>9 (21)</td>
</tr>
<tr>
<td>Yes</td>
<td>33 (79)</td>
</tr>
</tbody>
</table>

*Note: COPD = chronic obstructive pulmonary disease.*

**TABLE 2.** A Comparison of Medical Records With and Without an Asthma Action Plan (AAP) Before and After the Educational In-Service Intervention and System Procedural Change ($N = 42$)

<table>
<thead>
<tr>
<th>Use of AAP</th>
<th>Before Educational Intervention/ System Change</th>
<th>After Educational Intervention/ System Change</th>
<th>$p$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>40</td>
<td>9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>33</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
and completed with all applicable data areas fully filled out on the chart, or “no,” it is not completed fully or not on the chart. This strict operational definition helped to strengthen the validity in the determination of provider compliance change.

An outcome benefit of the project may be that in use of an AAP, providers are reminded of the standard care. For example, patients with asthma may have a controller medication such as an ICS but did not have a rescue inhaler as recommended by the NAEP Guidelines. Thus, the use of an AAP allows the provider and the patient a concrete way to manage the disease of asthma.

A limitation in the project was having trained medical assistant office staff rather than a health care provider complete some of the AAPs prior to the provider reviewing the AAP with the patient. However, because the office staff used the provider’s prescribed medications, there were few instances where changes needed to be made when the provider reviewed the AAP with the patient. Another limitation in the data collection process is the manual process of the medical record review. A manual medical record review is time intensive, less efficient than an automated data collection, and has the potential for error and bias especially if some medical records lack review. In addition, the findings from the project may not be generalizable across populations to other asthma patients in outpatient settings. To strengthen and further improve patient asthma outcomes, future study and analysis should be continued to determine if patients are managing and controlling their asthma well as a result of the use of an AAP.

Conclusion

Although EBP guidelines for asthma management have been developed and routinely updated, there remains a substantial variance between evidence-based recommendations and actual practice among providers and the care given to asthma patients (OLoughlen et al., 2009; U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, 2007). Translating research and guidelines into sustainable and effective practice is hastened by the process of knowledge translation. Effective knowledge translation ties continuing education, professional development, and QI processes, bridging the evidence–practice gap (Kent, Hutchinson, & Fineout-Overholt, 2009). Through following and incorporating the NAEP Guidelines (2007) guidelines, this QI project addressed the need to align asthma education to providers regarding the use of a symptom-based AAP in conjunction with the established guidelines for asthma control in reducing and preventing further asthma burden.

References


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Bethesda, MD: National Heart, Lung, and Blood Institute.


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Appendix
National Institutes of Health Asthma Action Plan

Asthma Action Plan

For: ___________________________  Doctor: ___________________________  Date: ___________________________
Doctor's Phone Number: ___________________________  Hospital/Emergency Department Phone Number: ___________________________

**Doing Well**

- No cough, wheeze, chest tightness, or shortness of breath during the day or night
- Can do usual activities

And, if a peak flow meter is used,

Peak flow: more than ___________% (80 percent or more of my best peak flow)

My best peak flow is: ___________________________

Before exercise

- Take these long-term control medicines each day (include an anti-inflammatory).

<table>
<thead>
<tr>
<th>Medicine</th>
<th>How much to take</th>
<th>When to take it</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

AND, if a peak flow meter is used,

Peak flow: more than ___________% (80 percent or more of my best peak flow)

My best peak flow is: ___________________________

**Asthma Is Getting Worse**

- Cough, wheeze, chest tightness, or shortness of breath, or
- Waking at night due to asthma, or
- Can do some, but not all, usual activities

**-Or-**

Peak flow: _________ to _________

(60 to 79 percent of my best peak flow)

**Medical Alert!**

- Very short of breath, or
- Quick-relief medicines have not helped, or
- Cannot do usual activities, or
- Symptoms are same or get worse after 24 hours in Yellow Zone

**-Or-**

Peak flow: less than _________

(60 percent of my best peak flow)

**DANGER SIGNS**

- Trouble walking and talking due to shortness of breath
- Lips or fingernails are blue

**Take this medicine:**

- Take ___________ 4 or ___________ 6 puffs of your quick-relief medicine AND
- Go to the hospital or call for an ambulance ___________ NOW!

See the reverse side for things you can do to avoid your asthma triggers.

Assessing the Educational Efficacy of the Patient Pamphlet, 
*Treatment Options for Avascular Necrosis of the Hip*

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Anthony J. Guarino, PhD  
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The primary purpose of this study was to assess the educational efficacy of the pamphlet *Treatment Options for Avascular Necrosis of the Hip* for patients with avascular necrosis (AVN). This pamphlet was designed to provide patients with information on 3 domains: (a) basic knowledge of AVN, (b) understanding of the risk factors associated with AVN, and (c) awareness of current AVN treatment options. The sample was composed of 20 AVN patients reflecting the racial diversity of the Eastern urban academic medical center. Fourteen (70%) of the patients were aware of their AVN diagnosis, and 13 (65%) reported having conducted research on AVN. Prior to the presentation of the pamphlet, the AVN Assessment Inventory, a 13-item true/false test assessing the three domains, was answered by the patients (see Appendix A). The principal investigator presented to the sample the educational pamphlet for their review and the AVN Assessment Inventory for their answers once again. Results of the 2 (Time: pre/post) × 3 (Domain: knowledge, risks, treatment) × 2 (Diagnosed: yes/no) × 2 (Prior research: yes/no) mixed analysis of variance (ANOVA) supported the educational efficacy of the patient pamphlet *Treatment Options for Avascular Necrosis of the Hip*. Implications of this study are discussed.

**Keywords:** avascular necrosis; femoral head; risk factors; BMAC procedure

Avascular necrosis (AVN) of the femoral head is a painful disorder that results from temporary or permanent loss of blood supply to the bone (Orban, Cristescu, & Dragusanu, 2009). When the blood supply is cut off, bone tissue dies causing bone to degrade, which often leads to collapse of the femoral head, osteoarthritis, and the need for total hip replacement (Gangji et al., 2004). AVN results from both traumatic causes including injury, fracture, or damage to the blood vessels and/or atraumatic causes such as use of glucocorticoids or use of alcohol (Lafforgue, 2006). The etiology of AVN of the femoral head may have a genetic basis (Mont, Jones, & Hungerford, 2006). This disease usually affects patients in their late 30s and early 40s (Kaushik, Das, & Cui, 2012), and males are affected up to three times more than females (Malizos et al., 2007). In the United States, steroid medications and alcohol abuse are among the most widely recognized risk factors associated with developing AVN and account for 90% of the underlying causes (Kelly & Wald, 2007). Not surprisingly, AVN is more common in
populations associated with excessive alcohol consumption, for example, South Korea (World Health Organization, 2001). Sickle cell disease is a major risk factor for developing AVN in African Americans (Mukisi-Mukaza et al., 2000; Pace, 2007) and is prevalent in African countries such as the Democratic Republic of the Congo (formerly Zaire; Sergeant, 1994). Legg–Calvé–Perthes (LCP) disease is the most common cause of AVN in children, with the greatest incidence in the Japanese, Mongolian, Eskimo, and Central European children and with a low incidence in Blacks and American Indians (“Avascular Necrosis,” 2012).

Classification systems are tools that are widely used to stratify the severity, prognosis, and indications for treatment of many orthopedic conditions (Mont, Marulanda, et al., 2006). The classification system for patients with AVN has been established by Association Research Circulation Osseous (ARCO, 1992). In early-stage AVN, the goals for patients with AVN include managing pain, optimizing physical function, and preventing progression to later stage disease (Mont, Zywiel, Marker, McGrath, & Delanois, 2010; Steinberg, 1988). Presently, core decompression surgery (i.e., the removal of a core of dead or ischemic bone) is the most often performed procedure for managing symptoms in early-stage disease (Gangji et al., 2004; Steinberg, 2000). Although core decompression surgery can be effective in providing symptomatic relief, pain from AVN may reoccur and the underlying disease is generally unaffected. In an effort to provide longer lasting and possibly permanent relief and affect new bone growth in the zone of ischemia, the bone marrow aspirate concentrate (BMAC) procedure was recently developed. This minimally invasive procedure injects bone marrow stem cells to stimulate new bone growth, thus attenuating progression of the disease. The efficacy of the BMAC procedure has been assessed in two prospective trials. Preliminary results indicate that the treatment can arrest progression of the disease to the stage of the subchondral fracture (Stage III) and reduce the need for total hip replacement (Gangji, DeMaertelaer, & Hauzeur, 2011; Gangji, Toungouz, & Hauzeur, 2005). In later stages of AVN, treatment goals include relieving pain and preserving the integrity of the femoral head for as long as possible to prevent advancement to total hip arthroplasty (Kakaria, Sharma, & Sebastian, 2005; Petrigliano & Lieberman, 2007). These later stages require both surgery and behavioral changes (Kelly et al., 2012). Any possible benefits from the BMAC procedure could be jeopardized if the patient continues using steroids and/or drinks alcohol excessively (Gangji et al., 2004; Hernigou & Beaujean, 2002). Patients who are otherwise healthy and practice good health habits (i.e., neither require steroids nor drink alcohol or smoke in excess) have a greater probability of preventing further progression of the disease.

To exercise more control over their health habits and become more actively involved in their own health care, patients require (a) basic knowledge of their malady, (b) an understanding of the risk factors, and (c) awareness of current treatment options (Bandura, 2004; Lev, 1997). Although a comprehensive literature search yielded patient information from other organizations on AVN in general, there was a paucity of literature related to the BMAC injection procedure. To provide information on the causes, risk factors, and various treatment options for AVN of the hip, Treatment Options for Avascular Necrosis of the Hip (Boston Medical Center, 2009), was developed emphasizing the BMAC injection procedure. The information in this educational pamphlet could lead patients to better informed treatment decision making as well as presenting the skills required to live a healthier lifestyle (Lev, 1997). The primary purpose of this study was to investigate the efficacy of Treatment Options for Avascular Necrosis of the Hip in (a) providing basic knowledge, (b) understanding the risk factors, and (c) identifying treatment options.

Methods

Participants

Twenty patients were participants for this study. Inclusion criteria for this research required the following: (a) positive radiographic/imaging result, (b) diagnosed as Stage I or Stage II of the ARCO (1992) classification system, and (c) at least 18 years of age. Because the medical center provides care for an underserved, racially and ethnically diverse population, patient education was purposefully aimed at addressing their health care disparities (Kaplan & Greenfield, 2004). All races were eligible to participate.

Procedure

To eliminate bias and miscommunication, patient confidentiality was strictly adhered to, and accuracy and completeness while conveying information was communicated to all patients with consideration of any cultural differences. Nonjudgmental attitudes were displayed toward all patients with refrain from exerting any
influence on the interactions with an opinion. The principal investigator distributed the educational pamphlets for the patients to review. Although professional interpreter services would have been available through the medical center, all patients spoke and understood English, thereby negating the need for language interpretation.

**Instrumentation**

Prior to the educational intervention, patients were queried on their age, if they were diagnosed with AVN (yes/no), and if they perceived themselves as informed on AVN (yes/no). These variables served as covariates in the statistical analysis. In addition, the patients were given the AVN Assessment Inventory (see Appendix A), a 13-item true/false test, developed by the first author (MJL) to assess the patients’ comprehension in three AVN domains: (a) basic knowledge, (b) risk factors, and (c) treatment options. The generation of these items evolved from an extensive research literature review as well as from the knowledge and experience of professionals involved with AVN with a Flesch-Kincaid readability index at an eighth grade level.

The principal investigator presented the educational pamphlet Treatment Options for Avascular Necrosis of the Hip (Boston Medical Center, 2009) to the sample. The pamphlet was designed for patients at an urban academic medical center who sought evaluation of hip pain and were subsequently diagnosed with AVN or for those patients who were already diagnosed with AVN and had been referred by another provider or who had self-referred for further evaluation. The brochure is a six-page guide consisting of frequently asked questions concerning information on causes, risk factors, and various treatment options for AVN of the hip, emphasizing the BMAC injection procedure, with a Flesch-Kincaid readability index at a 10th grade level. Participants were asked if they had any additional questions not addressed in the educational pamphlet. At the completion of educational intervention, the AVN Assessment Inventory was again administered. In total, the educational intervention took 30 min to complete.

**Data Analyses**

Data were analyzed both quantitatively and qualitatively. A 2 (Time: pre/post) × 3 (Domain: knowledge, risks, treatment) × 2 (AVN: yes/no) × 2 (Informed: yes/no) mixed ANOVA with appropriate follow-up tests was conducted to analyze the quantitative element of this study (Meyers, Gamst, & Guarino, 2013). Alpha was set at lower than .05. The qualitative aspect of the study employed a postintervention interview using constant comparison as the interpretational analysis.

Permission for this study was sought and obtained from Boston University’s institutional review board (IRB) and Spaulding Rehabilitation’s IRB. After permission was obtained, an administrative assistant informed potential patients of the study. If interest was expressed by a patient, a patient’s contact information was passed on to the principal investigator. The invitation to participate was read in a memo by the principal investigator. If the patient agreed to participate, he or she was enrolled in the pilot study as a participant. Consent was inferred by completion of the pretest. Confidential demographic information was obtained prior to completion of the pretest.

**Results**

The participants were composed of 9 females and 11 males ranging in age from 20 to 61 years, ($M = 41.80, \pm 10.97$). Fourteen (70%) of the patients were aware of their AVN diagnosis and 13 (65%) perceived themselves as informed on AVN. Although this sample reflected the racial diversity of that community, unfortunately, no Asians were available to participate. All participants spoke and understood English, thus there was no need for an interpreter.

Results of the mixed ANOVA indicated a statistically significant time effect with overall scores increasing 17.83%. Table 1 presents the means, standard error of measurement ($SEM$), and the 95% confidence interval (95% CI).

In addition, there was a significant Time × Informed interaction effect with the noninformed group, achieving greater gains (21.2%) than the informed group (4.6%). Table 2 presents the means, $SEM$, and the 95% CI.

Interestingly, there was a domain effect reporting that basic knowledge was consistently significantly scored lower than either risk factors or treatment

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*Note. SEM = standard error of measurement; 95% CI = 95% confidence interval.*
TABLE 2. The Means, SEM, and the 95% CI for Informed × Time

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Note. SEM = standard error of measurement; 95% CI = 95% confidence interval.

options. There were no significant differences between risk factors and treatment options.

Table 2 presents the means, SEM, and the 95% CI. Appendix B presents all the means, standard deviations, and cell sizes for this study.

Results of the interviews revealed two broad categories with three broad themes. The first category was the design of the educational tool, which encompassed two broad themes: the question-and-answer format of the educational tool and the ease that patients felt in understanding the content. The second category was identification of risk factors that cause AVN, which encompassed one broad theme: gaining insight into what caused their AVN.

More than half (60%) of the patients stated that the information as presented was easy to understand, helpful, and informative. In general, patients believed that the pamphlet answered their questions and favored the educational pamphlet’s question-and-answer format. Postintervention, patients stated that they felt the pamphlet provided important information concerning AVN risk factors and admitted confidence to confront their issues related to steroid medication for their chronic illness or past use of alcohol without feeling judged (e.g., “Reading it makes me emotional and tearful. I was forced to confront issues in my life identified in the booklet that pertain to me.” “I would have liked to have had this information prior to the time I started drinking.”)

Patients reported that the educational pamphlet was both easy to read and informative. The 13 questions of the AVN Assessment Inventory used the true/false format. This format facilitated learning by limiting patients’ choices (thus providing a 50% chance of responding correctly). In addition, 12 of the 13 questions were “true.” Both the high true rate and identical pre-/posttests were designed to reinforce learning.

Discussion

The findings of this study strongly support the educational efficacy of the pamphlet, Treatment Options for Avascular Necrosis of the Hip for patients with AVN. The time effect illustrated that all the patients, regardless of their AVN status or informed level, improved their scores significantly across all three domains. In addition, the significant Time × Informed interaction effect demonstrated that the not well-informed patients, who scored lower on the pretest, raised their scores to the equivalent level of the informed group on the posttest. Based on the improvement in scores on the posttest in knowledge, risk factors, treatment options, and the responses from patients who found the educational intervention helpful and informative, there is an inference that patient learning took place, perhaps influencing pertinent behavioral choices necessary to result in improved clinical outcomes (Lorig, 2001).

The educational intervention provided by Treatment Options for Avascular Necrosis of the Hip to patients and assessing their knowledge appears to ameliorate the learning objectives to optimize the care provided to patients with AVN. The ability of patients to become empowered with knowledge concerning their disease process enables them to make consistent, competent, and well-informed decisions for their own care and treatment (Laverack, 2004; Lorig & Holman, 2003). This is an important concept for patients with AVN because influencing their decision making about modification of risk factors known to cause AVN is essential to achieve optimal clinical outcomes in conjunction with the BMAC surgery (Gangji et al., 2004; Hernigou & Beaumou, 2002). Treatment Options for Avascular Necrosis of the Hip for patients with AVN was designed to focus on improving clinical outcomes through patient education about knowledge, behavioral risk factors, and treatment options known to be associated with the disease. Optimization of clinical outcomes in terms of physical function and deterrence of disease progression can be measured by additional studies.

The study results were limited by several factors. The use of a convenience sample and small size of the sample limit generalizability of findings. Because all patients spoke and understood English, this pilot study was limited in its ability to evaluate its effectiveness to other potential patients who spoke and understood other languages only. The study results were limited by a lack of ecological validity in that patients who undertook the intervention were constrained by conducting
it in the hustle and bustle of a busy clinical environment. On the other hand, all patients were subjected to the same learning conditions creating no advantage to where they were situated when they undertook the intervention. Another limitation of this study may be nonparticipation of Asian persons. Although all races were invited to participate, patients of Asian descent were not included in this study because no Asian patients were available for evaluation during the time that this study was being conducted.

The findings of this study reveal that providing information specific to a patient population seeking care and treatment for early-stage AVN provides the opportunity for those patients to achieve optimal clinical outcomes in preventing further progression of the disease to later stages. Findings from this study emphasize the need for patient education on AVN to influence decision making on behavioral modifications and treatment modalities that may determine the course of their disease. Acquisition of knowledge leads to better informed treatment decision-making and building skills that can lead to change (Lev, 1997). Patient education that focuses on general knowledge, risk factors, and available treatment options for early-stage AVN empowers patients with the knowledge which allows them to exercise more control over their health habits and the chance to make changes which may affect their long-term prognosis (Bandura, 2004). Although behavioral modifications alone are not believed to deter the progression of the disease, as a condition of surgery, patients are requested to modify any behavioral risk factors that are known to cause AVN to optimize clinical results. The contents of the Treatment Options for Avascular Necrosis of the Hip pamphlet will provide patients the skills to achieve these goals.

References


Correspondence regarding this article should be directed to Michelle J. Lespasio, DNP, JD, NP, Boston Medical Center. E-mail: michelle.lespasio@bmc.org
Appendix A
The AVN Assessment Inventory

1. If detected in early stages, proper treatment of avascular necrosis of the hip offers the most promising outcomes.
2. If left untreated, avascular necrosis of the hip is a potentially disabling condition.
3. The most common causes of nontraumatic AVN of the hip include treatment with steroids and excessive regular use of alcoholic beverages.
4. The more alcoholic drinks you consume on a daily basis, the higher your risk of developing AVN.
5. Surgical intervention of AVN is used to either deter or delay progression of early disease or to treat advanced disease.
6. Physical therapy is useful in preventing AVN from getting worse.
7. The three most important things you can do to prevent AVN is to avoid excessive use of alcohol, avoid smoking, and take the lowest dose of steroids if you need to take them.
8. The bone marrow aspirate concentrate (BMAC) procedure is thought to provide a significant benefit in treatment of AVN by preventing further progression of the disease and by stimulating new bone growth.
9. The BMAC procedure is considered a minimally invasive surgical procedure.
10. The recovery period following the BMAC procedure is relatively short.
11. If you have AVN of the hip, it is advised that you avoid impact sports such as running or jumping.
12. Typically, if your work is primarily sedentary, you may return to work after a BMAC within a week or two after the procedure if you feel well enough to do so.
13. Following the BMAC procedure, you will be asked to see your surgeon for routine evaluations over a 2-year period.

AVN = avascular necrosis.
### Appendix B
Means, Standard Deviations, and Cell Sizes

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AVN = avascular necrosis.
Lambl’s Excrescence: An Uncommon Cause of Cardioembolic Stroke

Evangeline N. Veloria, MS, ACNP
New York Presbyterian–Columbia University Medical Center

Lambl’s excrescences are long, hypermobile, filiform structures occurring at sites of valve closure. These are thought to originate from fibrin deposition over the injured endothelium. Lambl’s excrescences have been previously associated with acute embolic stroke. Herein, the case of a previously healthy 25-year-old man found to have Lambl’s excrescence after presenting with acute ischemic stroke is described. Localization, morphology, pathogenesis, differential diagnosis, prevalence, clinical significance, and treatment options are also reviewed.

Keywords: Lambl’s excrescences; valvular strands; valvular excrescences; cardioembolic stroke

Cardioembolic strokes account for 14%–30% of all ischemic strokes. Transesophageal echocardiography (TEE) has emerged as an important imaging modality for evaluation of potential sources of systemic emboli. Common causes include thrombi, valvular calcifications, vegetations, tumors, atherosclerotic plaque, and wall defect serving as passageway for embolism. High-risk cardioembolic conditions include atrial fibrillation, recent myocardial infarction, mechanical prosthetic valve, dilated cardiomyopathy, rheumatic mitral stenosis, endocarditis, atrial myxoma, patent foramen ovale, atrial septal aneurysm, left ventricular aneurysm, atrial or ventricular septal defects, calcific aortic stenosis, and mitral annular calcification (Arboixa & Alióc, 2010).

Lambl’s excrescence is a fairly rare disease entity that has been associated with ischemic strokes as described in several case reports (Aziz & Baciewicz, 2007; Kalavakunta, Peddi, Bantu, Tokala, & Kodenchery, 2010; Nighoghossian et al., 1997; Nighoghossian et al., 1998; Rhee, Choi, Kim, Shin, & Kim, 2010; Wolf, Spiess, Vasic, & Huber, 2007). This article describes the case of a young man who presented with acute ischemic stroke and was found to have a Lambl’s excrescence. A review of current literature is also provided.

Case Presentation

John is a 25-year-old, right-handed, athletic, White man without known past medical history. He presented to our medical center after suddenly experiencing transient right hemiparesis and dysarthria lasting approximately 5 min. On admission, his vital signs were stable. No neurological deficit was noted during physical examination. Electrocardiogram and chest radiograph were normal. Carotid ultrasound imaging showed no signs of carotid stenosis. Routine laboratory tests were within normal limits. Hypercoagulability studies that included antithrombin, protein C/S activity, factor V Leiden, antiphospholipid antibodies, homocysteine, lipoprotein, and lupus anticoagulant failed to show any coagulopathies. A TEE was performed and revealed normal right and left ventricular functions and absence of thrombus in the left atrial appendage with normal tricuspid and mitral valves. Agitated saline contrast
study failed to demonstrate right-to-left shunting at the atrial level. No atheroma was noted on the thoracic aorta. There was no aortic valve stenosis or insufficiency. However, a long, hypermobile, filiform echodensity measuring 1.3 cm was visualized on the right coronary cusp of the aortic valve. This finding was most consistent with a giant Lambl’s excrescence. In the absence of other possible stroke etiologies, a diagnosis of cardioembolism most probably because of Lambl’s excrescence was made. He was started on systemic anticoagulation. He did not develop any further focal neurological deficit during this hospital stay. He was eventually discharged home on Hospital Day 9, receiving warfarin anticoagulation.

He did well until 2 weeks after hospital discharge when he again experienced transient right hemiparesis and dysarthria lasting approximately 5 min. Emergent CT imaging of the head and follow-up MRI of the brain revealed subacute embolic stroke in the left central pons and corpus callosum. Because of stroke recurrence despite systemic anticoagulation, a multidisciplinary decision was made for surgical intervention. He was subsequently discharged home with plans for hospital readmission on the day of cardiac surgery. Subsequently, he was admitted on the day of surgery. An upper hemisternotomy was performed. There was a 1.3 cm frond-like mass on the right coronary cusp consistent with a Lambl’s excrescence. This was carefully and successfully resected without the need to replace the aortic valve. He was weaned off cardiopulmonary bypass without difficulty.

His postoperative course was uncomplicated. He was readily extubated 4 hr after surgery. He did not require any vasoactive infusion. He was discharged home on Postoperative Day 4. Histopathological examination of the excised tissue revealed a 13–2–1-mm connective tissue covered by a single layer of endothelial cells consistent with a large Lambl’s excrescence. He was seen 4 weeks after hospital discharge. He reported feeling fine and denied any new episodes of cerebrovascular events.

Discussion

Lambl’s excrescences, also referred to as valve excrescences and valvular strands, were first described in 1856 by Vilém Dušan Lambl, a Bohemian physician. These are fine, thin, fibrous, thread-like strands that arise at sites of valvular closure. These strands are less than 1 mm thick and at least 10 mm long. These processes may exist as a single strand, in rows or clusters. These contain a fibroelastic, hypocellular, avascular, connective tissue core covered by a single layer of endothelial cells. In addition, these band-like structures exhibit undulating independent motion (Aziz & Baciewicz, 2007; Jaffe & Figueredo, 2007; Kalavakunta et al., 2010; Lambl, 1856; Nakahira, Sawai, Katsumata, Imanaka, & Minami, 2008).

Diagnosis of Lambl’s excrescence is by TEE, which has greater sensitivity and specificity than transthoracic echocardiography (TTE) in detecting valvular lesions especially in the left-sided valves. However, definitive diagnosis of Lambl’s excrescence is determined by histopathological examination because at times, it is impossible to distinguish between fibroma, fibroelastoma, myxoma, or thrombi using TEE alone (Sun et al., 2001; Wolf et al., 2007).

Conditions to consider in the differential diagnosis of Lambl’s excrescences include papillary fibroelastoma, myxoma, redundant leaflet, thrombi, vegetations, cardiac neoplasms, and metastasis. Lambl’s excrescence may be most difficult to distinguish from papillary fibroelastoma. Echocardiographically, Lambl’s excrescences appear as independent, hypermobile, thin, strand-like structures on the line of valve closures. Papillary fibroelastoma, on the other hand, appear as pedunculated lesions on the mechanically less-affected parts of the valves and other endocardial areas. Because of the exposed location on the valve leaflet lines of closure, Lambl’s excrescences are smaller than papillary fibroelastoma and do not show prominent branching. In contrast, papillary fibroelastomas are more bulky, can be attached to the valve through a stalk or pedestal, and may contain multiple finger-like projections. Histologically, both contain a central core of elastic connective tissue. However, Lambl’s excrescences are covered by a single layer of endothelial cells, whereas papillary fibroelastomas contain regions of multiple layers of endothelial cells (Hort & Horstkotte, 2006; Jaffé & Figueredo, 2007; Kalavakunta et al., 2010; Rhee et al., 2010).

Lambl’s excrescences have been seen in association with chronic rheumatic heart disease, pulmonary or systemic hypertension, and chronic endocarditis. These strands may also occur without concomitant cardiac disease (Bruinsma & Leicher, 2002; Nighoghossian et al., 1997).

These filiform structures were initially described as originating from the aortic valve. These valvular strands arise most commonly on the ventricular side.
of the aortic valve and on the atrial side of the mitral valve. Pulmonary, tricuspid, and prosthetic valvular involvements have also been reported (Bruinsma & Leicher, 2002; Homma, Di Tullio, Sciacca, Sacco, & Mohr, 2004; Jaffe & Figueredo, 2007; Kalavakunta et al., 2010).

Although the pathogenesis of these strands is unclear, it is thought that the initiating event may be small tears of the endothelial surface in areas of high stress and trauma such as the mitral and aortic valve closure lines. Further fibrin deposition over the injured endothelium results in the growth of these excrescences. More complex forms are because of adherence of multiple adjacent excrescences exhibiting a sea anemone appearance and have been referred to as giant Lambl’s excrescences. These valvular strands are also thought to be age-related fibrosis at the thickening line of the left heart valvular closure lines. Familial disposition for filiform structures has not yet been demonstrated, and reports of congenital or those occurring during childhood are rare (Aziz & Baciewicz, 2007; Bruinsma & Leicher, 2002; Hort & Horstkotte, 2006; Jaffe & Figueredo, 2007; Nighoghossian et al., 1998; Rhee et al., 2010).

There have been studies suggesting that valve excrescences do not appear to be associated with cardioembolic events and may have been incidental findings by echocardiography (Cohen et al., 1997; Roldan, Shively, & Crawford, 1997). However, it had been reported in larger studies that about 6%–40% of those patients with suspected cardioembolic stroke were found to have valve strands as detected by TEE compared with 0.3%–2.3% prevalence in patients undergoing TEE for other diagnostic reasons (Freedberg, Goodkin, Perez, Tunick, & Orsinelli, 1996; Homma et al., 2004; Tice, Slivka, Walz, Orsinelli, & Pearson, 1996).

The exact mechanism of ischemic stroke in patients with valve excrescences remains unclear. However, it is presumed that part of the strand or a thrombus that formed on the strand’s surface can break apart, embolize, and contribute to the development of cardioembolic cerebral infarction. It also appears that larger valve strands were more frequently involved in systemic embolization (Bruinsma & Leicher, 2002; Freedberg et al., 1995; Homma et al., 2004; Rhee et al., 2010; Sun et al., 2001; Tice et al., 1996).

A generalized treatment strategy has not been established because of lack of large controlled studies. Reports have suggested that conservative follow-up is warranted in asymptomatic patients with incidental valvular strand findings (Gowda et al., 2003; Roberts et al., 1997). For patients who present with ischemic stroke, several treatment options are available. These include antithrombotic therapy with antiplatelet and oral anticoagulation and cardiac surgery. In terms of medical management, both aspirin and warfarin are equally effective in preventing recurrent adverse events in patient with ischemic strokes and valvular strands as demonstrated in a randomized double-blind trial (Homma et al., 2004). Several reports have also suggested that surgical removal of these excrescences have been effective in preventing stroke recurrence (Bruinsma & Leicher, 2002; Daveron et al., 2005). In patients with recurrent stroke despite antithrombotic therapy, surgical resection has been successful in preventing further cardioembolic events as described in this current case presentation and in two other case reports (Aziz & Baciewicz, 2007; Nighoghossian et al., 1997).

**Conclusion**

In conclusion, there is increasing evidence to suggest that Lambl’s excrescences visualized by TEE are associated with cardioembolic events. The most likely mechanism appears to be damage along the endothelial surface resulting in fibrin deposition. Based on a recent double-blind randomized study, antiplatelet and oral anticoagulation therapies are equally effective in preventing recurrent stroke events. Surgical resection appears to play a role in the management of patients with recurrent events despite antithrombotic therapy. Further controlled studies looking at larger series of patients with long-term follow-up are recommended to understand the causative role, pathophysiology, and appropriate guidelines for the treatment of Lambl’s excrescences.

**References**


Lambl's Excrescence


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This was a case of headache and neck pain that developed into a three-vessel dissection because of a noninflammatory, nonatherosclerotic disease affecting the cervical and vertebral arteries called cervicocranial fibromuscular dysplasia (FMD). Cervicocranial FMD is not a rare disease, but it remains commonly underdiagnosed. With educated and prudent health care professionals, complications could be averted and lives could be saved. Four essential themes are highlighted. First, health care professionals need to ensure that the basic use of stethoscopes in assessing bruits is performed consistently, especially for young females. Furthermore, FMD needs to be another differential diagnosis for younger patients with new onset hypertension and stroke. Second, it is important to stress that this disease can affect anyone regardless of health and/or status. Last, the third and fourth themes emphasize that education and research are lacking on cervicocranial FMD. It is imperative that health care professionals stay updated with current knowledge to prevent misdiagnosis and underdiagnosis.

Keywords: fibromuscular dysplasia; stroke; neck pain; headache

Case Presentation

This was a case of a 39-year-old Asian American woman who has been generally healthy other than this recent incident: After a nondescript day at work, L.R. (not her real initials) went home with a mild headache and neck pain, not entirely unusual because of her history of high cervical disc disorder. What was odd were the difficulty and the time it took for her to figure out how to reposition her car seat to exit her vehicle and the apparent complexity she encountered upon opening her house door with her keys. She also attempted to communicate with her daughter yet could not seem to articulate clearly. Despite being a health care professional, she ignored these symptoms and attributed them to her cervical disc disorder. She decided to nap thinking that her symptoms would improve, but after 2 hrs, she continued to have speech difficulty. She tried to make a phone call but could not make sense of the phone numbers or letters.

L.R. was admitted to the emergency room with expressive dysphasia, mild headache, and neck pain. She denied any trauma, fever, chills, chest pain, shortness of breath, change in vision and hearing, numbness, or weakness. Her past medical history was positive for hyperlipidemia, cervical disc disease, and chronic headache. Home medications included Excedrin and Tylenol with no known drug allergies. Her past medical history was positive for hypertension, coronary artery disease, hyperlipidemia, and diabetes.
At admission, her blood pressure was elevated at 148/92 mmHg. Her physical exam was essentially unremarkable other than a positive left carotid bruit. Other findings showed no jugular venous distention, S1 and S2 noted with regular rate and rhythm, lungs clear to auscultation, muscle strength 5/5, deep tendon reflexes, and cranial nerves grossly intact; she was neurologically stable except for her expressive dysphasia.

The stroke team protocol was initiated. Computed tomography (CT) angiogram of the brain and neck and CT perfusion of the brain were performed immediately. These showed a left internal carotid artery dissection with occlusion versus near occlusion, a small frontal lobe stroke, and no evidence of blood flow impairment to the left hemisphere. A magnetic resonance imaging (MRI) of the brain without contrast was also completed, confirming the small, left frontal stroke. Chest x-ray results were within normal limits, and her electrocardiogram showed normal sinus tachycardia at 104 beats per minute. Laboratory results were essentially normal, although her total cholesterol level was 253 mg/dl, low-density lipoprotein (LDL) was 155 mg/dl, high-density lipoprotein (HDL) was 73 mg/dl, and triglyceride level was 127 mg/dl.

A cerebral angiogram was subsequently performed to evaluate the arterial dissection and occlusion. There was in fact a three-vessel dissection involving the left internal carotid artery and bilateral vertebral arteries. There was near occlusion of the left internal carotid artery from the midcervical segment (approximately C3) to the skull base with a large, near-occlusive thrombus at the proximal aspect. A pseudoaneurysm was noted at the left vertebral artery. Because of the large communicating arteries and well-developed collateral circulation, flow to the left anterior circulation was maintained without delay.

Overview

L.R. has a condition called cervicocranial (also known as cerebrovascular or cervicocephalic) fibromuscular dysplasia (FMD). Previously thought to be a rare disease, evidence shows cervicocranial FMD is not uncommon (Olin & Sealove, 2011). It has been found in the young, healthy, and fit, often going undiagnosed and overlooked (Parikh, 2011). This condition affects about 5% of Americans accounting for at least 10 million individuals (Burton, 2009) or approximately 2 per 1,000 individuals in the general population (Persu et al., 2012). It is most common in women affecting 4% between the ages of 20 and 60 years (Olin & Sealove, 2011). Data on racial prevalence is not yet available, although Whites are more commonly affected than Blacks (Wilson & Hughes, 2010).

FMD typically involves the carotid and vertebral arteries (25%–30% of the time) and, more commonly, the renal arteries at 60%–75% (Wilson & Hughes, 2010). More than one artery is commonly diseased in 26% of the population affected. Those with cervicocranial FMD have 95% involvement of the internal carotid artery and 12%–43% of the vertebral artery. When carotid arteries are affected, the C1-C2 cervical segments are usually involved (Bhuriya, Arora, & Khosla, 2008).

Many cervicocranial FMD patients are asymptomatic; however, major “vascular catastrophes” may stem from FMD resulting in transient ischemic attack (TIA), stroke, or, much worse, dissection as the presenting symptom such as in L.R.’s case. Symptomatic cervical artery dissection recurs at a rate of 1% per year in patients with FMD and is often related to another cervical artery (de Bray et al., 2007). If the renal arteries are affected, hypertension is the most common presentation. For this case study, the focus is on cervicocranial FMD.

It is not clear how FMD originates (Touze et al., 2010). It has been identified in family members in 10% of cases; hence, a possible genetic component is likely (Plouin et al., 2007). Hormonal factor in disease development has also been considered because FMD is greater than four times more common in women than men (Plouin et al., 2007). However, previous reproductive history, use of birth control pills, or sex hormones have not been found to correlate with the development of FMD (Slovut & Olin, 2004). Other possible causes are smoking or mechanical factors including trauma (Plouin et al., 2007). None of these factors appeared to be present in L.R.’s case.

Differential Diagnosis

Vasculitis is an important consideration (Mazza et al., 2008) that can cause a small pseudoaneurysm interruption in the vasculature of the major arteries. Other differential diagnoses include atherosclerotic stenoses and stenoses associated with connective tissue disease such as vascular Ehlers-Danlos syndrome, Williams syndrome, and type 1 neurofibromatosis (Plouin et al., 2007).

In L.R’s case, the presence of a left internal carotid artery dissection, bilateral vertebral artery dissection,
and subsequent left middle cerebral artery frontal ischemic stroke were pathognomonic for FMD. Fortunately, her circle of Willis was complete allowing circulation and subsequent oxygenation of the left side of the brain, blunting the effect of the left frontal lobe stroke from near occlusion of the left internal carotid artery. Her left middle cerebral artery territory was supplied by the right internal carotid artery across the anterior communicating artery. Figure 1 shows L.R.’s nearly occluded left internal carotid artery. Figure 2 shows the stenosis in L.R.’s left cerebral circulation from her MRI angiogram. Figure 3 shows her severely diseased left internal carotid artery.

Pathogenesis

The exact pathophysiology of FMD is still unknown (Touze et al., 2010). It has been identified that FMD is a nonatherosclerotic, noninflammatory disease affecting the musculature of the arterial walls with proliferation of smooth muscle cells and fibrous tissue involving the middle and distal sections, leading to segmental narrowing of the small- and medium-sized arteries (Olin & Sealove, 2011; Persu et al., 2012; Plouin et al., 2007). It rarely affects the proximal segments of arteries unlike in atherosclerotic stenosis (Plouin et al., 2007). The medial layer of the arterial wall is most commonly affected, followed by the intima and, rarely, the adventitial layer (Slovut & Olin, 2004).

The angiographic appearance of FMD typically shows a characteristic “string-of-beads” appearance with areas of multifocal stenosis that alternate with small aneurysms (Koc & Koc, 2006). This multifocal appearance occurs in 80% of cases, although FMD can also be unifocal with single stenosis or demonstrate tubular narrowing with at least 1-cm stenosis in length (Persu et al., 2012). Lesions occur bilaterally 60% of the time in high-grade stenosis (Mazza et al., 2008; Persu et al., 2012). In L.R.’s case, she had high-grade stenosis of the bilateral vertebral arteries and near occlusion of the left internal carotid artery.

In some patients, there are no signs and symptoms indicative of cervicocranial FMD. Others may report headache, lightheadedness, vertigo, and/or tinnitus (Wilson & Hughes, 2010). Patients may initially present with neck pain from arterial dissection.
Cervicocranial FMD predisposes patients to multiple cervical dissections (Wilson & Hughes, 2010). Accordingly, this is because of the underlying arteriopathy from the FMD lesions that leads to weakening of the arterial musculature. Neurological symptoms appear when FMD lesions become complicated because of TIA or stroke from dissection, ischemia, embolus, thrombosis, or hemorrhage from the rupture of an associated aneurysm (Plouin et al., 2007). The presence of underlying cervicocranial FMD should also be considered in cases of asymptomatic cervical bruit, retinal ischemic events, or pulsatile tinnitus (Persu et al., 2012). In L.R.’s case, it was a question whether her previous symptoms of headache and neck pain were actually signaling FMD, which she relegated to her cervical disc disorder, or if both were coexisting.

**Diagnostic Testing**

Cervicocranial FMD is often underdiagnosed (Olin & Sealove, 2011). Noninvasive diagnostic tests in increasing order of precision include ultrasonography (to show irregular stenosis) and MRI and CT angiography (to improve visualization of the middle and distal arteries and detect intracranial aneurysms; Persu et al., 2012; Plouin et al., 2007). MRI and CT angiogram are the recommended diagnostic tests to support the diagnosis for cervicocranial FMD (Persu et al., 2012). The gold standard is intra-arterial angiography, but it is usually suggested only for patients when revascularization may be necessary because of its invasiveness (Persu et al., 2012).

Patients with cervicocranial FMD with hypertension should also be screened for renal FMD (Persu et al., 2012). Echo Doppler is used as the first-line screening test to evaluate for stenosis of the renal artery or asymmetry of the kidneys. CT and MRI angiography are used to confirm the diagnosis, especially to identify the typical multifocal angiographic string-of-beads appearance (Persu et al., 2012).

**Management and Treatment**

Once imaging confirms the presence of dissection without rupture, inpatient management is initially geared toward immediate anticoagulation with intravenous heparin. When stable, this is changed to subcutaneous low molecular weight heparin followed by Coumadin typically for 3–6 months on an outpatient basis. Follow-up with MRI or CT angiography is recommended before discontinuing anticoagulation and initiating lifelong antiplatelet agents (Wilson & Hughes, 2010).

Patients with symptomatic cervicocranial FMD can benefit from interventional procedures through percutaneous balloon angioplasty (Olin & Pierce, 2008). Patients with macroaneurysms are treated with either stent or surgery (Mazza et al., 2008). Microvascular neurosurgical clipping or endovascular coiling may be necessary to secure ruptured intracerebral aneurysm (Plouin et al., 2007).

Serial neurological checks and close monitoring of blood pressure are also indicated. Preventing hemodynamic stress is essential because it has been suggested that FMD can be caused by anterior vessel wall fragility (Wilson & Hughes, 2010). Furthermore, while patients are on anticoagulants, appropriate monitoring of international normalized ratio is necessary.

**Case Study Resolution**

L.R.’s blood pressure quickly resolved during her stay in the hospital. Her dysphasia gradually improved, although there remained some speech hesitation with minimal limitation in speed of processing and responding. She received speech therapy evaluation and developed resolution of speech disturbance within weeks.

In retrospect, she reported having nearly daily headaches for several months with a posterior neck component. Typically, she receives interventional injections for her cervical disc disorder but reportedly did not have the time for these treatments before the incident, so she resorted to deep tissue massages and Excedrin with minimal resolution (see Figure 4 showing her MRI of the cervical spine).

Her specialists’ consultations revealed that she may have had underlying FMD symptoms all along, but her history of cervical disc disorder and chronic headaches...
complicated her symptomatology. Her chronic headaches are now being managed with a prophylactic medication, and her neck pain is minimal and manageable. She is still on an anticoagulant medication, but her recent MRI and CT angiogram showed improved flow with a lesser degree of stenosis and resolving cervicocranial aneurysm.

Implications to Practice

Several themes are highlighted based on current knowledge on FMD and in L.R.’s case as presented in this case study. The implications to practice especially to nurse practitioners are as follows.

Going Back to the Basics

The simple use of stethoscopes by prudent health care professionals to listen cautiously for carotid and abdominal bruits can aid in screening for cervicocranial and renal FMD especially in younger patients (Olin & Pierce, 2008). Although some patients with FMD are asymptomatic, once stenosis increases, bruits can be heard and are excellent findings to alert providers before severe complications occur. Although bruits are nonconclusive, these are helpful as initial diagnostic tests. Just as screening is important in other illnesses, it is reasonable to say that a good number of younger patients could be saved from complications such as stroke, hemorrhage, and even death through simple screening of patients to facilitate appropriate diagnosis. It is also essential to ensure that health care professionals perform comprehensive physical exams on young and healthy patients like their ill counterparts. Furthermore, FMD should be included as another differential diagnosis for younger patients with new onset of hypertension, stroke, or subarachnoid hemorrhage (Wilson & Hughes, 2010).

It Can Happen to You, Too

Although a patient may be young, physically fit, and with a generally unremarkable health history, it is important to know that FMD has been shown to affect the young and healthy. Even worst, patients who have FMD coupled with an unhealthy lifestyle (i.e., smoking, lack of exercise, poor nutrition) can consequently develop atherosclerosis and result to potentially devastating vascular events. Patients and the public need to be well-educated about their own health especially with the current drive toward self-management of chronic illnesses.

Similarly, health problems can happen to health care professionals as well. They may not always be the best patients, being in denial or second-guessing their symptoms. This is evident in L.R.’s case. Despite her near-daily headaches for several months and difficulty verbalizing on the day of her admission, she opted to ignore her symptoms thinking that they will resolve. Even more potentially devastating complications could have occurred. Paying attention to one’s health and not taking anything for granted should take precedence every time.

Getting Educated

Information on FMD is minimally taught in medical and nursing schools. It is currently poorly understood and largely unknown to the public (Burton, 2009) and health care professionals leading to underdiagnosis. This can potentially lead to unsafe situations and unnecessary complications. Health care professionals have a great responsibility to stay current with their knowledge.

Research Is Scant

There is still little evidence-based information published about FMD, particularly cervicocranial FMD. At present, there is an international registry of patients that provide data to allow further study of this condition (Olin & Pierce, 2008). It is hoped that more understanding and comprehensive knowledge will come about in the near future with more research studies.

Conclusion

FMD is not rare; it is in fact more common in the general population than was initially thought, but it remains underdiagnosed. It has a presentation similar to other disease processes, and although many cases are asymptomatic, FMD can commonly present with grave vascular compromise. However, it can also be minimized by prudent practitioners and educated patients. Therefore, implications to practice are essential and research into FMD is warranted. Nurse practitioners can pave the way toward addressing underdiagnosis and misdiagnosis and advancing evidence-based knowledge through further research.

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An Active Surveillance and Referral Program to Ensure Respiratory Syncytial Virus Prophylaxis for the Pediatric Congenital Heart Disease Population: A Quality Improvement Project

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**Background:** Congenital heart disease (CHD) is the leading cause of death within the first year of life because of birth defects. Complications related to respiratory infection caused by respiratory syncytial virus (RSV) increase risks in the CHD population. Prevention is key to minimizing risk, and administration of RSV prophylaxis, palivizumab, is recommended for infants with hemodynamically significant heart disease. **Objective:** Use the electronic medical record (EMR) to identify and ensure appropriate referral of CHD patients eligible for RSV prophylaxis. **Design:** Comparative, cross-sectional study design. **Setting:** Cardiac specialty clinic of a regional children’s hospital. **Population:** CHD patients younger than 24 months of age eligible for RSV prophylaxis. **Intervention:** Use the EMR to develop a method for identifying CHD patients eligible for RSV prophylaxis and implement a referral process. **Results:** Similar number of patients in the 2 RSV seasons studied. Rates of eligibility for RSV prophylaxis over the 2 seasons were the same. Improvements in documentation of eligibility by the provider from the first season to the second. **Limitations:** Inability to determine referral rates. Initial EMR search did not identify patients eligible for RSV prophylaxis. Inconsistent EMR data entry. **Conclusions:** Ongoing education on eligibility for RSV prophylaxis. Need for automated EMR referral. Ongoing evaluation of EMR systems identifying patients eligible for RSV prophylaxis.

**Keywords:** congenital heart disease; RSV; prophylaxis; electronic medical record
Congenital heart disease (CHD) occurs in about 1 out of every 125 infants born each year and is the leading cause of death within the first year of life because of birth defects (Jenkins et al., 2007; U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute, 2011). Significant improvements in outcomes have been achieved over the past several years because of refined surgical technique and advancements in pediatric intensive care management. However, complications still may arise from other illnesses that are common and otherwise easily tolerated by a healthy child. One such illness is lower respiratory infections caused by respiratory syncytial virus (RSV). Infants and children with a diagnosis of CHD are at increased risk for respiratory complications (Hall et al., 2009) if infected with RSV despite adequate cardiovascular management.

Cardiac and respiratory functions are not independent but operate as one system. The performance of these systems is even more significant in an infant or child with CHD. For example, respiratory function is greatly altered by abnormalities of cardiovascular structure and function, specifically anomalies that create decreased pulmonary blood flow. For a patient with a right-to-left shunt or decreased pulmonary blood flow, an acute respiratory infection associated with RSV has the potential to compound an already compromised cardiorespiratory system.

A ventilation perfusion mismatch is created by alterations in pulmonary blood flow. In the case of decreased pulmonary blood flow, hypoxia is directly affected by the extent of the limit in blood flow. An alteration in the ventilation perfusion ratio is expected in most patients with CHD and will be closely monitored and managed in the healthy CHD patient. Infants and children with single ventricle physiology have an obligatory intracardiac mixing that results in lower than normal systemic saturation. A respiratory infection caused by a preventable pathogen such as RSV has the potential to further diminish oxygenation and place the child in a life-threatening situation.

The impact of RSV infection on CHD patients has been examined. Studies have reported that these infants have an increased rate of hospitalization, a longer length of stay, more severe illness requiring admission to the intensive care unit, and higher mortality than children without chronic illness (Chang & Chen, 2010; Duppenthaler, Ammann, Gorgievski-Hrisoho, Pfammatter, & Aebi, 2004; Feltes, Hodinka, Paridon, Wernovsky, & Sondheimer, 2006; Langley & Anderson, 2011; Spaeder, Carson, Vricella, Alejo, & Holmes, 2011; Thorburn, 2009; Wright et al., 2002).

Palivizumab (Synagis) is a humanized monoclonal antibody produced by recombinant DNA technology and is indicated for prevention of serious lower respiratory tract infections caused by RSV (Medimmune, LLC, 2009). Palivizumab provides passive immunity (Johnson et al., 1997). Therefore, dosing is required monthly throughout the RSV season, which typically occurs November through April. Administration occurs via the intramuscular route and dosed at 15 mg/kg. It is recommended for high-risk infants and children younger than 24 months of age with a diagnosis of bronchopulmonary dysplasia (BPD), hemodynamically significant CHD, or premature infants born less than 35 weeks’ gestation. (Medimmune, LLC, 2009).

The Impact-RSV Study Group (1998) demonstrated safety and effectiveness of palivizumab for prevention of serious RSV illness in premature infants and children with BPD. Guidelines were endorsed by the American Academy of Pediatrics (AAP Committee on Infectious Diseases and Committee on Fetus and Newborn, 1998) to assist providers in identifying patients who should receive RSV prophylaxis with palivizumab. Additional studies included the CHD population and provided evidence of safety and efficacy to support administration of palivizumab in this high-risk group as well (Boyle, Mellen, Mitchel, Wright, & Griffin, 2000; Checchia et al., 2011; Feltes et al., 2003; Medrano Lopez & Garcia-Guereta, 2010; Weisman, 2009).

RSV prophylaxis guidelines for CHD infants include a criterion with the phrase, “hemodynamically significant heart defect” (AAP Committee on Infectious Diseases, 2009; AAP Committee on Infectious Diseases and Committee on Fetus and Newborn, 2003), yet there are no measurable criteria of “hemodynamically significant” to guide providers in identifying infants and children with cardiac defects who should receive RSV prophylaxis. This determination typically has remained at the discretion of the individual provider (Afghani et al., 2006; Cohen et al., 2008).

Individual provider discretion as a means to identify RSV prophylaxis–eligible CHD patients is rife with potential miscommunication and confusion. In addition, determining the appropriate provider to interpret the RSV prophylaxis criteria can be problematic. Because the primary care provider typically gives vaccine education and administration recommendations to parents, it could be expected that this group would also determine the need for RSV prophylaxis. The cardiologist
or cardiothoracic specialist should have the expertise to evaluate the child with a heart defect and determine their hemodynamic stability. Thus, these providers may be perceived as the most qualified to appropriately identify the qualifying CHD patient. Confusion results in a classic case of patients “falling between the cracks” without a designated responsibility of who should identify and refer for RSV prophylaxis.

There is a dearth of evaluative literature reporting programs promoting adherence to the RSV prophylaxis guidelines or studies indicating effective referral systems, especially those focusing on the CHD population. Two studies identified RSV prophylaxis–eligible infants diagnosed with bronchiolitis (Mansbach, Kunz, Acholonu, Clark, & Camargo, 2007; Moynihan, Kim, Young, & Checchia, 2004). Both studies revealed poor adherence to AAP guidelines for RSV prophylaxis. Moynihan et al. (2004) reported that 65% of those who were eligible did not receive RSV prophylaxis, and Mansbach et al. (2007) reported that 51% did not receive the recommended prophylaxis. A program consisting of educating health care workers on AAP guidelines, RSV activity, and a designated referral clinic was implemented by Afghani et al. (2006) and demonstrated improved adherence to AAP RSV prophylaxis recommendations. In addition, a program in Canada requiring CHD patients to be prospectively identified and approved by an area cardiology service ensured that the at-risk group was appropriately referred and received the recommended prophylaxis. Having set guidelines and an organized referral method limits unnecessary costs by ensuring that those not included in the guidelines are not referred (Warren, Langley, Thomas, & Scott, 2007).

This quality improvement project attempted to correct a deficiency previously identified in the current process of identifying and referring CHD patients for RSV prophylaxis in a cardiac specialty clinic of a midwestern regional children’s hospital. This clinical problem was identified during data collection for an in-house project that surveyed the assessment of risks for RSV in a subset of CHD patients during routine clinic visits. There was no method within the institution’s electronic medical record (EMR) documentation to determine if high-risk CHD patients had been assessed for RSV prophylaxis eligibility during the cardiology or cardiac surgery clinic visit. A screening question was added to the nursing documentation flow sheet, but subsequent evaluation demonstrated continued inconsistencies, and CHD patients still were not accurately identified for RSV prophylaxis eligibility. This clinical problem prompted further exploration for a system improvement within this specialty outpatient clinic. The intervention consisted of using the EMR to identify and appropriately refer patients eligible for RSV prophylaxis.

Questions for this project were as follows: (a) Will implementation of “best practice” RSV prophylaxis guidelines for CHD patients consistently identify CHD patients eligible for RSV prophylaxis, and (b) will eligible patients then be appropriately referred?

Methods

The aim of this quality improvement project was to identify and refer patients followed in the outpatient cardiac specialty clinic of a major tertiary care hospital who were eligible to receive RSV prophylaxis. A secondary aim was to compare identification and referral rates between two consecutive RSV seasons. All ethical aspects of implementing and analyzing an improvement plan were followed. The primary investigator had full access to the EMR as the pediatric cardiothoracic surgery nurse practitioner. An application to the institutional review board (IRB) was submitted and the IRB determined that approval was not needed because this was a quality improvement project. Confidentiality was maintained for all personal identifiers included in the data collection. All data was maintained on a standardized data collection form and stored on a password-protected computer.

The first step in planning the intervention was meeting with a member of the EMR team in charge of building/creating a query to search the EMR for CHD patients eligible for RSV prophylaxis, and (b) will eligible patients then be appropriately referred?

Search criteria were established based on current recommendations presented in the AAP policy statement outlining RSV prophylaxis prescribing guidelines (AAP Committee on Infectious Diseases, 2009) for the CHD patient population. These criteria included patients registered in the cardiac specialty clinic (including outreach clinics); age 24 months or younger at the beginning of the local RSV season; diagnosis of CHD indicated by the International Classification of Diseases (ICD)-9 codes 745.0–747.9, ICD-9 code 416 for pulmonary hypertension, and ICD-9 codes V04.82 (need for RSV immunization) and V04.82 (need for RSV vaccination); and current medications prescribed for treatment of congestive heart failure and pulmonary hypertension (furosemide, sildenafil, captopril).

The initial search using each of the specific eligibility criteria was found to be missing known CHD patients eligible for RSV prophylaxis for the 2011–2012
RSV season. To obtain a more inclusive list of patients, the EMR search was revised to include all patients who met the age criteria at the beginning of the 2011–2012 RSV season. Although this was known to include patients who would not meet eligibility criteria and increase the number of records to be reviewed, it was necessary to expand the list to ensure all eligible patients were accurately identified and evaluated. This expanded search allowed for added information to be gathered and resulted in a more in-depth analysis of this particular patient population. The same expanded EMR search was also applied to the 2010–2011 season, identifying all patients meeting age specifications.

Medical records, specifically recent cardiology clinic visits, of identified patients were reviewed by a cardiothoracic pediatric nurse practitioner to confirm eligibility for RSV prophylaxis following the AAP guidelines. If it was unclear during this review, a referral had been made for the 2011–2012 RSV season, and then the appropriate referral was initiated.

To guide this change process, the model of improvement, developed by the Associates in Process Improvement, was used as a framework to develop a goal and then measure the outcome (Langley, Nolan, Nolan, Norman, & Provost, 2009). The Plan-Do-Study-Act (PDSA) cycle was used to test changes, specifically during the development of the EMR search. The PDSA cycle allowed for frequent evaluations and small adjustments to be completed during the process instead of delaying evaluation to the final analysis (Langley et al., 2009).

Analysis of extracted data was conducted using descriptive statistics. The patient data from the 2011–2012 RSV season was compared to the patient data from the 2010–2011 RSV season. Comparison of two consecutive RSV seasons was intended to examine if there was improvement after the intervention was implemented.

Results

Data collected from the 2011–2012 RSV season were compared to the data collected from the 2010–2011 RSV season (see Figure 1). There were 187 EMR charts from both seasons reviewed. The data comparison revealed similarities in numbers of patients meeting age criteria as well as the total numbers of patients eligible for RSV prophylaxis for both RSV seasons. With each RSV season, 36% of patients aged 24 months or younger were eligible to receive RSV prophylaxis based on AAP guidelines. In reviewing the clinic notes of each patient, there was an improvement in documentation of RSV eligibility by cardiac providers from the first season (2010–2011) to the second season (2011–2012). Documentation of RSV prophylaxis recommendations in clinic notes more than doubled (see Figure 1) from the first to second season. Although the project was not specifically directed at measuring documentation of RSV prophylaxis recommendations by cardiac providers, an improvement was recognized. Attempts at determining referral rates for RSV prophylaxis for the two seasons were unsuccessful because of the absence of a method of documenting referral within the EMR.

Discussion

For the 2 consecutive years reviewed, greater than one-third of the cardiac specialty clinic’s CHD population was RSV prophylaxis–eligible. For the 2010 season, 35 out of 98 children aged 24 months or younger and for the 2011 season, 32 out of 89 children of the same age comprised the eligible group. This highlighted the need for a reliable system to identify and refer CHD patients for RSV prophylaxis in this outpatient cardiac setting.

Data analysis demonstrated that improvement was possible. This was evident from the increased documentation of RSV prophylaxis eligibility in provider clinic progress notes from the 2010–2011 to the 2011–2012 RSV season. One possible explanation for this improvement could be the increased awareness of a need for documentation and increased adherence to AAP RSV prophylaxis eligibility criteria as a result of providers’ exposure to this improvement project. This outcome has also been recognized in the literature (Afghani et al., 2006; Warren et al., 2007). Reminders from nursing staff responsible for obtaining preauthorization for third party reimbursement may also have facilitated increased
RSV prophylaxis eligibility documentation in the clinic progress note by cardiac providers.

The original concept of an EMR search to identify and refer CHD patients eligible for RSV prophylaxis did not produce the expected results. An improvement plan was formulated to capture eligible patients by developing a focused search of the EMR based on specific eligibility criteria. Problems identified in obtaining a comprehensive list were related to inconsistent and inadequate EMR data entry, specifically regarding patients seen in the outreach clinics. Because the outreach clinics do not use the hospital EMR, the documentation of diagnosis and medications may not have been as accurate or complete as compared to patients seen in the hospital-based outpatient clinic. Thus, the EMR could not be used to search the specific criteria in the outreach clinic records.

RSV prophylaxis referral lists were maintained by pen-and-paper method as well as computer spreadsheets and kept by staff responsible for seeking preauthorization. Consequently, there was no access to this information within the EMR. The absence of EMR documentation of RSV prophylaxis referrals hindered the comparison of referral rates from one season to the next. An automated referral option available in the EMR as a computerized provider order entry process has since been developed. This system will be evaluated with the 2012–2013 RSV season.

Conclusions

It is clear that a reliable EMR system is needed to consistently identify RSV prophylaxis–eligible patients and to trigger a referral alert. This type of system change requires a team approach with involvement of individuals who possess the expertise in the use of the EMR as well as providers well acquainted with the specific patient population and RSV prophylaxis eligibility criteria. Results of this project have been shared with the cardiology/cardiothoracic surgery specialty clinic team. Plans for continued improvement include (a) ongoing education related to the AAP guidelines for prescribing RSV prophylaxis and (b) continued adjustments within the EMR to identify the most direct method for identifying eligible patients.

Upon final implementation of an improved EMR identification and referrals within the cardiac specialty clinics, the process can be extended to other specialty clinics with patients who may be eligible to receive RSV prophylaxis. In addition, there are pediatric patients at risk for bacterial endocarditis and serious infections secondary to functional or surgical asplenia or patients with genetic or acquired immunodeficiency states. These patients would also need a reliable EMR identification and best practice alert system for bacterial endocarditis prophylaxis or additional vaccination needs.

The EMR is an important tool for documentation of patient care and tracking patient outcomes. The data from an EMR search potentially could serve to assist the clinician in identifying a subset of patients requiring unique care. The EMR search in this quality improvement project yielded limited data. However, the significant volume of patients fitting the established AAP RSV prophylaxis eligibility guidelines supports the importance of having a reliable method for identifying and treating this vulnerable population.

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Using the Bartering System in Nursing: Can Service-Learning Curricula Be Bartered for Tuition Reimbursement?

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To be adequately prepared to care for patients in the 21st century, nurses will need to obtain advanced degrees. However, rising tuition costs and limited tuition reimbursement may make returning to school economically prohibitive for talented and motivated nurses. This article suggests that one solution maybe the use of bartering for employer tuition dollars through the completion of service-learning course projects. Because health care organizations generally have a long list of needed but unfunded projects that need to be completed, and educators often grapple with ways to create meaningful registered nurse learning experiences, service and education working collaboratively have the potential to engage nurses in real-time projects that can improve patient care processes and outcomes.

Keywords: bartering; service-learning projects; advanced education for nurses

Background

The Institute of Medicine recommends nurses achieve higher levels of education to work in the complex health care environments of the 21st century (Lavizzo-Mourey, 2012). Advanced education for registered nurses (RNs) has also been linked to better patient outcomes (Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Aiken, Clarke, Sloane, Lake, & Cheney, 2008) and is widely supported by many nursing organizations and accrediting bodies (Delaney & Piscopo, 2007). In addition, many states are working on legislation that will require an RN to have a bachelor of science in nursing degree in 10 years (Trossman, 2008), and designations of excellence such as Magnet are linking institutions’ application eligibility to percentage of RNs with advanced degrees (American Nurses Credentialing Center, n.d.). Yet, a 2008 Health Resources and Services Administration study found that only slightly more than 25% of diploma- and associate degree-educated RNs nationwide reported completion of a baccalaureate degree in nursing (Maneval & Teeter, 2010).

Literature has demonstrated that although RNs believe they should continue their education, limited resources are the most significant barriers to enrolling in a baccalaureate program (Delaney & Piscopo, 2004, 2007). Talented and gifted RNs who want to continue their education are often challenged with the multiple responsibilities that make additional education an unreachable goal. The desire and opportunity to return to school as an adult learner is often met with the reality of rising tuition costs with limited tuition monies readily available, managing personal financial needs while planning or

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funding of child’s college tuition, and/or supplementing a family member’s income after a loss of employment. A study of Pennsylvania associate degree and diploma nursing graduates reported that 95.8% of the respondents indicated that they would pursue a bachelor’s degree or higher if additional monies were available (Maneval & Teeter, 2010). Zimmerman, Miner, and Zittel (2010) note that many health care administrators support and value higher levels of education in the workplace but recognize that supporting and subsidizing advanced education are two distinct and different entities. Nurses report that professional growth and personal satisfaction are frequent and effective motivators, but direct and indirect costs are significant barriers to acquiring a bachelor’s degree (Graf, 2006). If academic progression continues to be a priority, it is important that tuition reimbursement be examined, and the payoff must be congruent with the risk. Bartering may present a strategy that can address the needs of the RN and the organization.

Bartering

Bartering (barter) has strong historical roots and can be traced etymologically as Middle English (bartren) and Anglo-French (bareter; 15th century) as a business strategy whereby trades and goods were exchanged and used as a currency (Merriam-Webster, n.d.). Historically, it was not unusual for doctors to be paid with chickens or cords of wood. But bartering can also happen in other settings, and organized barter exchanges appear to be growing (Consumer Reports, 2013). Bartering was employed during the Great Depression when Robert Porterfield, founder of the famous Barter Theater, set up an evening of entertainment in exchange for produce and goods (Calderon, 1985). There is currently a paucity of literature on bartering in nursing education. Some merit in service and academia has been described. The use of bartering has been implemented successfully in continuing education programs when resources were scarce (Calderon, 1985). Aroian (1993) described a curriculum model where RNs as students participated in cost-containment, quality improvement pilot projects at the institutions in which they were employed.

Interestingly, bartering exemplars are described in industry newspapers and journals. The True North Health Center in Falmouth, Maine, uses a bartering system. It accepts “time dollars” in addition to real dollars through the Portland Hour Exchange Program. Patients in this program perform services in the community, such as raking leaves, to earn the currency, and they can spend it for care at True North (Molinsky, 2011). Lincoln Medical and Mental Health Center in New York allows eligible artists—actors, dancers, musicians, poets, writers—and individuals employed in the creative arts to barter their services for physician appointments, laboratory tests, hospital treatment, emergency care, medical and surgical procedures, dental care, prescriptions, and other services. In Arkansas, at the Bono Barter Clinic, people can barter for health care with something they made, grew, or produced. At the Maple City Health Care Center in Goshen, Indiana, patients who cannot afford to pay for their medical care can instead volunteer their time at community organizations (Consumer Reports, 2013).

Trade International Exchange, a national bartering service organization, describes bartering between small businesses to obtain health care services they otherwise could not afford. Bartering is being used to obtain primary medical care visits, dental work, chiropractic services, some specialty medical procedures, and prescription and pharmaceutical goods. For some small businesses, the motivation to barter for health care services is related to the economy. For others, new regulations requiring comprehensive health care coverage for employees are the basis for these relationships. These companies are trading printing, construction, tax preparation, fine dining, and other services for medical or dental service needs of staff on an as-needed basis.

The Challenges of Academic Progression

One reality of academic progression is the continuous increase in tuition costs, whereas employers flatten or decrease tuition reimbursement. How then does nursing service advance the profession in an economically challenged environment? When developing curricula for RNs, faculties often grapple with finding meaningful learning experiences. “Service-learning has been described as a valuable educational pedagogy that enables students to apply classroom content to real-life situations” (Murray, 2013, p. 626). Because the literature has numerous exemplars that describe the value of service learning, it is reasonable and timely to consider the relevance of bartering to nursing curriculum and RN education (Murray, 2013; Bassi, 2011).

Bartering With Service-Learning Course Projects for Tuition Reimbursement

Nurses state that lack of tuition reimbursement is a barrier to returning to school. It has been established that
service-learning educational models cultivate nurses' personal and professional transformation. “Service learning programs aim to develop students’ academic learning, interpersonal skills and sense of responsibility while enabling them to make meaningful contributions to the community” (Bassi, 2011, p. 162). Murray (2013) correlates an increase in civic responsibility, communication skills, awareness of health care disparities, social injustices, cultural proficiency, and personal growth with service learning. This author proposes collaboration between academia and service that uses bartering, credit-bearing, employer-driven service-learning projects for tuition reimbursement. Because health care organizations generally have unfunded projects which need to be completed, employer-based service-learning projects can be used to obtain academic credit, creating “real-time” meaningful RN learning experiences. The RN is well-positioned to have the most current knowledge and understanding of the types of quality improvement projects which need to be implemented to change and improve patient care in agency. Using a bartering system can be a meaningful, successful means to secure tuition reimbursement which promotes advanced education and ultimately benefits both the individual RN and the employing agency. Health care systems have a history of providing tuition assistance for working RNs; but the challenge today is the discrepancy between available tuition dollars and the rising tuition rates of academic institutions. Tuition reimbursement opportunities that underwrite an RN’s education in exchange for a specific work commitment can benefit both the student and the organization (Graf, 2006). The college/university would then align the bartered project with the course objectives and course evaluation. The result would be a health care institution with an educated workforce who understands its goals and mission, a nursing curriculum that incorporates as a key member of the health care team who can contribute to the national nursing objective of raising the standards of nursing (Delaney & Piscopo, 2007; Zimmerman et al., 2010). RNs as students can use the bartering process to demonstrate critical thinking abilities to improve patient care. We cannot wait to take action; failing to grow a better educated nursing workforce risks disastrous results. This is particularly important in light of the aging nursing workforce as well as the coming expansion of health insurance coverage in 2014 (Lavizzo-Mourey, 2012).

Conclusion

Bartering opportunities have remained a sound method of trading services. The RN can improve patient care delivery because they understand the culture and can recognize potential error-prone situations in the health care setting. Today, reconceptualizing advanced education can and should be meaningful to the RN who is a student. The RN pursuing further education can be incorporated as a key member of the health care team who can contribute to the national nursing objective of raising the standards of nursing (Delaney & Piscopo, 2007; Zimmerman et al., 2010). RNs as students can use the bartering process to demonstrate critical thinking abilities to improve patient care. We cannot wait to take action; failing to grow a better educated nursing workforce risks disastrous results. This is particularly important in light of the aging nursing workforce as well as the coming expansion of health insurance coverage in 2014 (Lavizzo-Mourey, 2012).

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Improved Quality in Diabetes Care for the Working Uninsured Using Systems Thinking With an Interprofessional Team

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**Purpose:** To develop and implement a standardized, evidence-based diabetes management program using an interprofessional team of volunteers, students, and staff at a new free clinic for the working uninsured. **Method:** Retrospective studies were conducted on convenience samples of 40 diabetic patients pre- and post-redesign of diabetes care. **Results:** Diabetes patients received access to a diabetes management program with quality improvement measures of outcomes. **Discussion:** This quality improvement initiative provided an assessment of the processes for diabetes care delivery and outcomes.

**Keywords:** systems thinking; nurse practitioner and doctor of nursing practice; diabetes and chronic disease; interprofessional care

Nurse practitioners with doctor of nursing practice (DNP) degrees provide organizational leadership to impact patient clinical outcomes. The role of nurse practitioners as leaders in primary health care is crucial for promoting improved patient outcomes. “Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking,” of *The Essentials of Doctoral Education for Advanced Nursing Practice*, recognizes that nursing professionals with a DNP degree demonstrate excellence in orchestrating strategic initiatives for enhancing quality of health care services. A systems thinking design can be applied for promoting these improved patient outcomes (American Association of Colleges of Nursing [AACN], 2006). This article describes the development and implementation of an evidence-based diabetes management program designed by an interprofessional team (IPT) of volunteers, students, and staff at a new free clinic for the working uninsured. This quality improvement (QI) initiative was an initial assessment conducted for improving diabetes care outcomes at the free clinic.

**Purpose**

During a recent period of economic decline and skyrocketing demands for health care services in the country, a free health clinic for the working uninsured opened in northeastern Pennsylvania. Volunteers, students, and staff comprise the workforce at the clinic. Volunteers are the largest segment of health care providers. These volunteers possess diverse health care backgrounds, providing challenges for ensuring that all patients seen at the clinic receive the same standards of care.

Shortly after the clinic opened, a large influx of patients requiring chronic disease management, especially diabetes care, occurred. This was because of individuals...
losing health insurance secondary to rising unemployment rates during that year from 5.6% to 9.5% (U.S. Bureau of Labor Statistics, 2013). The increased demands for health care services in this population created the emergent need for a consistent organizational structure where evidence-based care was delivered. An evaluation of patient care by the assistant medical director, who is a nurse practitioner with a DNP degree, revealed that standards of diabetes care were not being applied uniformly to all diabetic patients. Therefore, an IPT was mobilized to develop and implement a strategic plan using a systems thinking design to promote a structured approach to the delivery of a standardized diabetes management program.

Review of the Literature

Diabetes mellitus is the seventh leading cause of death in the United States and is predicted to affect one of three citizens by 2050, based on current trends in the prevalence. The cost of diabetes care is $174 billion annually, including $116 billion in direct medical expenses. Almost 2 million patients were diagnosed with diabetes in 2010. Estimates revealed that 26 million individuals in the United States are affected by diabetes, diagnosed or undiagnosed (8.3% of the population), whereas 79 million U.S. adults have prediabetes (Centers for Disease Control and Prevention [CDC], 2011).

Of concern to health care strategists is the alarming and burdensome numbers of patients with chronic disease who are impoverished (Bodenheimer, Chenn, & Bennett, 2009). Access to care for this vulnerable population poses challenges to disease management and improving outcomes of care. National declines in diabetes complications have been recorded because of preventive care practices (CDC, 2012). Advanced practice nurses educated at the doctoral level support health promotion and clinical prevention (AACN, 2006) and can contribute toward this decline through integration of American Diabetes Association (ADA, 2011) standards in clinical practice. These standards provide a framework for improving the quality of diabetes care through screening, diagnostic, and therapeutic actions. IPTs of health care disciplines can effectively design care delivery systems that promote self-management of this complex disease process (ADA, 2011). Patient-centered care is enhanced by IPTs of individuals from various health care disciplines collaborating to promote quality (Interprofessional Education Collaborative Expert Panel, 2011).

Managing the complexity of factors that accompany chronic disease, especially diabetes, can be accomplished with a systems thinking approach. This comprehensive process is becoming more accepted as a means of coordinating health care strategy for individuals, groups, organizations, communities, and social issues that affect the behavior of humans (Best, 2011). According to Senge (1990), systems thinking, or the fifth discipline, focuses on how “. . . the whole can exceed the sum of its parts” (p. 12), and this can be accomplished by changing processes in health care, comprehensively, through organizations learning new ways of thinking. A comprehensive, strategic plan directs decision making for advancing organizational services because identification of strengths and weaknesses can promote sustainability (Presley & Meade, 2002). QI outcomes contribute toward informed decision making for changes in clinical practice and promote ongoing evaluation of the proposed evidence-based interventions and outcomes. Data collection is ongoing and begins before, and continues after, the initial implementation of interventions (Melnyk & Fineout-Overholt, 2011).

Theoretical Framework

The chronic care model conceptualizes the challenges inherent for clinical management of diabetes and other chronic diseases. This model served as a framework for the development of the initial strategic plan for the health care delivery processes at the new free clinic. The six elements of the model work synergistically at the organization and community level to promote patient-centered delivery of care and include health system, delivery system design, decision support, clinical information systems, self-management support, and the community (Improving Chronic Illness Care, 2013).

Method

Pre- and post-retrospective studies were completed for data collection on five evidence-based, diabetes care outcomes. Separate institutional review board approvals were received. The setting was a free, community health care clinic in an urban area of northeastern Pennsylvania. Medical and dental care are provided to the working uninsured by an IPT of volunteers, students, and staff. The sample consisted of patients 18 years of age and older having a diagnosis of Type I or II diabetes mellitus. A power analysis determined the sample size. Charts of 40 patients in each study were randomly chosen from a clinic database registry.
After completion of the initial retrospective study, needs for improvement in diabetes care were identified, and a strategic plan was initiated by an ITP for design of a diabetes management program. Health disciplines represented on the planning team were nursing (advanced practice and nonadvanced practice roles), pharmacy, nutrition, and medicine, in addition to administrative and nonadministrative staff positions. Development of evidence-based, diabetes care systems for foot exams, pneumococcal vaccine (PV), influenza vaccine (IV), glycated hemoglobin (HbA1c), and diabetes self-management education (DSME) occurred. Table 1 provides details of the interventions employed. The five diabetes care outcomes initially chosen by the

<table>
<thead>
<tr>
<th>Diabetes Care Outcomes</th>
<th>Interventions Developed and Implemented</th>
<th>Expected Outcomes</th>
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</thead>
<tbody>
<tr>
<td>Foot exam</td>
<td>• Clarified the roles of each member on the interprofessional team</td>
<td>Documentation of a completed yearly foot exam by an appropriate provider of the interprofessional health care team</td>
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<td></td>
<td>• Provide standard documentation form for physical examination findings</td>
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<td></td>
<td>• Access to podiatrists</td>
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<td></td>
<td>• Access to cost-effective diagnostic studies, that is, arterial Doppler studies, as needed</td>
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<td></td>
<td>• Development of an evidence-based patient education pamphlet</td>
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<tr>
<td>Pneumococcal vaccine (PV)</td>
<td>• Clarified the roles of each member on the interprofessional team</td>
<td>Documentation of PV administration on the immunization record and diabetes flow sheet</td>
</tr>
<tr>
<td></td>
<td>• Availability of the vaccine in the clinic</td>
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<td></td>
<td>• Availability of nursing staff for administration of the vaccine during open hours of the clinic</td>
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<td></td>
<td>• Patient education information sheets for distribution</td>
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</tr>
<tr>
<td></td>
<td>• Obtaining consent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Documentation of patient outcomes on the diabetes flow sheet and immunization record</td>
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<tr>
<td>Influenza vaccine (IV)</td>
<td>• Clarified the roles of each member on the interprofessional team</td>
<td>Documentation of IV administration on the immunization record and diabetes flow sheet</td>
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<tr>
<td></td>
<td>• Ensuring availability of the vaccine in the clinic</td>
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<td></td>
<td>• Availability of nursing staff for administration of the vaccine during open hours of the clinic</td>
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<td>• Obtaining consent</td>
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<tr>
<td></td>
<td>• Documentation of patient outcome on the diabetes flow sheet and immunization record</td>
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<tr>
<td>Glycated hemoglobin (HbA1c)</td>
<td>• Clarified the roles of each member on the interprofessional team</td>
<td>Documentation of an HbA1c every 3–6 months on the diabetes flow sheet</td>
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<tr>
<td></td>
<td>• Access to affordable laboratory testing</td>
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<tr>
<td></td>
<td>• Develop systems for timely follow-up to diagnostic results</td>
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<tr>
<td></td>
<td>• Patient education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Documentation of results on the diabetes flow sheet</td>
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<tr>
<td>Diabetes self-management education (DSME)</td>
<td>• Clarified the roles of each member on the interprofessional team</td>
<td>Documentation of participation and completion of a DSME session on the patient education log</td>
</tr>
<tr>
<td></td>
<td>• Outlined roles of the educators who included a nurse practitioner, pharmacist, and nutritionist for conducting DSME sessions</td>
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<tr>
<td></td>
<td>• Developed face-to-face, group, and web-based DSME sessions based on standardized diabetes curriculums</td>
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<tr>
<td></td>
<td>• Offered patients a choice of face-to-face, group, and web-based sessions for flexibility in meeting patients’ learning needs</td>
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<td></td>
<td>• Documented participation on diabetes flow sheet and patient education log</td>
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assistant medical director were based on those which (a) were not being addressed by most volunteer providers, such as foot exams and DSME; (b) required the development of multiple systems that could be applied to other planned diabetes outcomes (the processes for HbA1c could be applied to other required blood work); (c) required development by most IPT members, such as DSME and vaccine administration; and (d) required networking of community resources, such as foot exams.

**Results**

Figure 1 presents QI data on patients receiving diabetes care outcomes pre- and post-integration of the new diabetes management program. Outcomes of data analysis before the IPT implemented changes included foot exam (17.1%), PV (17.1%), IV (39.0%), HbA1c (73.2%), and DSME (12.2%). Outcomes after integration of interventions included foot exam (52.5%), PV (35%), IV (27.5%), HbA1c (70%), and DSME (67.5%).

**Discussion**

Future research studies designed with rigor and include control groups and larger sample sizes would provide support to the effectiveness of using this clinical practice change model. This initial QI initiative at the clinic used a systems-thinking design to assess the needs for improving patient access to receiving quality diabetes care. These newly formed processes serve to align the organization for continuous evaluation of other identified evidence-based needs, leading to further QI and research projects. Two research studies are currently being conducted on these diabetes care outcomes by members of the same IPT on the effectiveness of face-to-face versus web-based DSME using a standard curriculum and survey for measurement of outcomes and on the attitudes of students on IPTs for promoting retention and, therefore, sustainability of the organization's strategic plan. This QI process revealed that documentation of IVs received off-site was not being completed in patient charts and, therefore, did not accurately reflect a patient's achievement of the IV diabetes care outcome. Documentation processes have been improved on site for IV administration. This project design can be employed in the development of other chronic disease management programs such as asthma and hypertension.

This QI initiative can serve as a model for other new free clinics that provide health care services to vulnerable populations, have limited resources for program development, and use volunteers with diverse clinical backgrounds. Nurse practitioners, with a DNP degree, are effective as leaders of IPTs for designing evidence-based health care delivery systems that promote quality patient care outcomes through application of QI. The QI process revealed outcomes that impacted patient-centered care and will enable the organization to continue meeting the ongoing needs in managing patient care, health care costs, and policy development.

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Telenutrition: An Integrated Approach to Delivering Medical Nutrition Therapy to Bariatric Surgery Patients via Synchronous Teleconsultation

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Bariatric surgery has emerged as a safe and effective means to substantial weight loss with subsequent resolution of comorbid conditions, improvement in quality of life, and increased longevity for the morbidly obese. Achieving significant and sustained weight loss following surgery requires lifelong dietary and behavior modifications. Bariatric patients are challenged to adhere to the postoperative plan and the clinician to provide the necessary support services to promote the patient’s adherence. Long-term outcomes rely on lifelong patient adherence and follow-up care. Dietary management is central to weight loss, and medical nutrition therapy (MNT) provides the patient with the knowledge and skills needed to modify dietary behaviors. Telenutrition offers a novel and innovative approach to nutritional counseling for bariatric patients who might otherwise have limited or no access. This article presents the use of synchronous teleconsultation to augment patient care following bariatric surgery by connecting patients with the registered dietitian through web conferencing. The objectives of this multicomponent telenutrition program are to improve patient access to MNT, augment clinician–patient interaction between office visits, increase patient satisfaction, and improve patient adherence to prescribed treatment plans, thereby optimizing both short- and long-term outcomes following bariatric surgery.

Keywords: telenutrition; medical nutrition therapy; synchronous teleconsultation; bariatric surgery
Rhodes, 2010). Another study found that most patients who are lost to follow-up care fail to appreciate substantial weight loss (te Riele, Boerma, Wiezer, Borel Rinkes, & van Ramshorst, 2010). Web-based dietary interventions offer the potential to improve access to care for greater numbers of individuals.

**Purpose**

This article describes the development and implementation of a unique approach to delivering MNT to bariatric surgery patients. An Internet-based program for eating assessment and training (iB-EAT) is a novel design whereby synchronous teleconsultation is used to connect the registered dietitian (RD) with one or more patients for lifestyle education and nutrition counseling. The long-term objectives of this multicomponent telenutrition program are to improve patient access to MNT, augment clinician–patient interaction between office visits, increase patient satisfaction, and improve patient adherence to prescribed treatment plans, thereby optimizing both short- and long-term outcomes following bariatric surgery.

**Background and Significance**

Bariatric surgery has emerged as a safe and effective means to substantial weight loss with subsequent resolution of comorbid conditions, improvement in quality of life, and increased longevity for the morbidly obese (O’Brien, 2010; Sjostrom et al., 2004). Bariatric surgery patients, however, face significant challenges in the months and years following surgical intervention. Achieving significant and sustained weight loss requires lifelong dietary and behavior modifications. Lack of compliance with postoperative follow-up care and patient difficulty in making lifestyle changes are frequently cited contributing factors to suboptimal outcomes (Shen et al., 2004; Xanthakos, 2009). Interdisciplinary care, which includes the ongoing involvement of experienced nutritionists, is considered essential to best practices for weight loss surgery programs (Lautz et al., 2009). The assessment, monitoring, and counseling provided by the RD can improve postoperative adherence and reduce the risk of nutritional deficiencies (Kulick, Hark, & Deen, 2010). Limited access to an RD can hamper even the most motivated of patients.

Telemedicine is increasingly being used for consumer-based health education and counseling. Telemedicine, as defined by the American Telemedicine Association (2012), is the use of advanced communication technologies, within the context of clinical health, to deliver care from one site to another to specifically benefit medical patients. A growing body of literature supports the use of telemedicine based on significantly improved outcomes and patient satisfaction. Advanced communication technologies that include tailored and nontailored Internet-delivered interventions, video-phone and videoconferencing, phone and e-mail consultations, text messaging, and home monitoring have been described in the literature as viable tools to augment the care of individuals with a myriad of health issues including diabetes, heart disease, Parkinson’s disease, and obesity (Fincher, Ward, Dawkins, Magee, & Willson, 2009; Krueger et al., 2010; Nakamura, Takano, & Akao, 1999; Savolainen, Hanson, Magnusson, & Gustavsson, 2008; Verhoeven, Tanja-Dijkstra, Nijland, Eysenbach, & van Gemert-Pijnen, 2010). Web-based interventions for weight loss have consistently proven to be efficacious, with the most optimal outcomes observed where the intervention involved human support, tailored educational materials, and high use (Bennett et al., 2010; Rothert et al., 2006; Saperstein, Atkinson, & Gold, 2007). Patient and clinician satisfaction with teleconsultations across multiple specialties has been evaluated and found to be high; both patient and health care professional perceive an improvement in the quality of care and service provided (Huston & Burton, 1997; von Wangenheim, de Souza Nobre, Tognoli, Nassar, & Ho, 2012).

The previously cited studies support the efficacy of using advanced communication technologies to augment patient care. These technologies can be used by multiple disciplines and in a myriad of ways with the bariatric surgery patient and might include MNT (telenutrition), psychological support (telepsychology or telemental health services), web conferencing to deliver specialized health information to individuals or groups of patients, and online support groups. Telemedicine offers the advantage of reaching far greater numbers of bariatric patients without regard to geographic or economic barriers, thereby bridging the gap between available resources and quality care.

A literature search across multiple databases using search terms telemedicine, telehealth, telenutrition, website, Internet, nutrition counseling, nutrition education, and web conferencing yielded no studies that described the use of live web conferencing to deliver MNT. Synchronous teleconsultations have been evaluated in the treatment of pediatric obesity. In a recent study, 81% of obese children and adolescents receiving one-on-one video
evaluations by a weight management specialist showed short-term improvements in their diet, activity level, or weight (Shaikh, Cole, Marcin, & Nesbitt, 2008). A pilot study evaluating the use of videoconferencing for family-based pediatric obesity group treatment found that it was highly feasible and greatly satisfactory to participants and providers (Davis et al., 2011).

A recent meta-analysis of computer-tailored interventions found that meaningful behavior changes can result from interventions delivered via the Internet (Krebs, Prochaska, & Rossi, 2010). The Dietary Approaches to Stop Hypertension (DASH) study examined the effect of a web-based nutrition education program on weight, blood pressure, and dietary benefits. (Moore et al., 2008). Patients enrolled in the DASH trial received weekly articles about healthy nutrition via the Internet and self-entered data on food intake, weight, and blood pressure. Continued use of the program for 12 months resulted in improvements of all dependent variables with a dose-response effect on weight and blood pressure. McIntigue et al. (2009) conducted a pilot study on the effects of an evidence-based lifestyle intervention for obesity management delivered via the Internet and demonstrated an average weight loss of 4.79 kg and a drop in systolic blood pressure of 7.33 mmHg in program completers. In the Informatics for Diabetes and Education Telemedicine (IDEATel) project (West, Laguna, Trief, Izquierdo, & Weinstock, 2010), televisits were demonstrated to be effective in establishing behavior change goals to help improve diabetes self-management. In this randomized controlled trial, patients who received case management delivered via Internet had improvement in glycemic control, blood pressure, and lipid levels (Shea & Consortium, 2007).

**Setting**

Our bariatric practice has an outpatient clinic located 60 miles from our main office. Prior to the initiation of iB-EAT, patients who were seen in our satellite clinic were managed by the nurse practitioner (NP) and did not have onsite access to an RD. Options for dietary counseling for patients seen at this remote site were limited to telephone consultation or traveling to the main office, which for most patients is a distance of 30–90 miles. Telenutrition provides patients in the remote setting with increased access to the services provided by the practice’s RD. They have the availability of real-time, face-to-face individual nutrition counseling via web conferencing and also have the option to attend webinars on various topics, such as mindfulness-based eating, and to participate in monthly nutritional support group meetings.

**Conceptual Framework**

Program conceptualization was based on behavioral constructs from several theoretical models for health behavior change. The nutrition and healthy lifestyle support provided through the iB-EAT program uses behavioral constructs from social cognitive theory (SCT), health belief model (HBM), and consumer information processing (CIP) model (Finkelstein & Cha, 2009; Revere & Dunbar, 2001). Self-efficacy (confidence in one’s ability to take action), behavioral capability (the knowledge and skills to influence one’s behavior), outcome expectation (beliefs about likely results of an action), and reinforcement (responses to an individual’s behavior that increase or decrease chances of recurrence) are the theoretical constructs on which the components of the iB-EAT program are formulated. The CIP model postulates that individuals can process only limited amounts of information, and information usability is maximized when it is provided in “chunks” or modules (Finkelstein & Cha, 2009). These concepts have been used in the design and staging of the multimedia education modules.

**Design and Methods**

The project design was directed at establishing live, two-way communication between the dietitian and one or more patients via secure, multipoint, web-based video-conferencing. The platform chosen is a browser-based commercial program available at a monthly fee, which allows for the organizing and planning of online meetings with up to 25 attendees, allowing for either a two-person meeting (RD and patient) or multiple connections (RD and a group of patients). A toll-free telephone number is available to dial into the meeting for audio if a microphone and speakers are not available. As the meeting host, the dietitian has control over the desktop display, audio feeds (e.g., muting), and modalities used for presentation, such as Word documents, videos, or slide presentations. Patients have the option to appear live on the desktop or remain anonymous for any group sessions.

Web-based conferencing is used for (a) individual patient counseling, (b) group education delivered in staged modules, and (c) nutrition support groups. Patients are invited to individual or group sessions by...
either the patient or the practice to incur the expenses associated with traveling to other geographic locations.

Discussion

Telemedicine is a relatively new treatment modality, and the issues surrounding and arising from this technology remain relatively unexplored. The Health Insurance Portability and Accountability Act (HIPAA) stipulates that all available methods should be used to ensure that patient privacy is maintained. Although the HIPAA security rule, which applies only to electronic-protected health information, does not specifically cover treatment sessions provided via web conferencing, physical and technical safeguards need be in place, such as equipment specifications and access restriction. Potential issues for security and confidentiality were considered in the development and planning of the iB-EAT program. The platform chosen is fully secured with end-to-end 128-bit encryption to audio, video, and information sharing and uses both secure sockets layer (SSL) and proprietary encryption. The conference content is sent over secured transmission control protocol/internal protocol (TCP/IP) connections. Patient authentication will be ensured when the RD compares the visual image of the web participant to that of the digital photograph contained in the patient's electronic medical record. The chosen platform has been scrutinized by the hospital's HIPAA officer and the information system department for purposes of data security and has been approved for use.

The second phase of the iB-EAT project began with a cognitive walk-through to assess usability. Cognitive walk-through is a technique for evaluating the design of a user interface for ease of use (Effken, 2009). The RD and NP connected via web conferencing for several walk-throughs. Once the users had become familiar with all the details of the web conferencing platform, patients were scheduled for individual sessions in the outpatient clinics. Initially, no new consultations for dietary assessment were scheduled but only follow-up visits with existing patients who had previously met face-to-face with the RD.

During the third phase of the project, usability, utility, and patient and provider satisfaction were evaluated using the Computer System Usability Questionnaire (Lewis, 1995). Once usability was established, the final phase involved expansion to group sessions for both education and support at multiple sites.

The iB-EAT program methodology offers an advantage over existing technology by enabling live, face-to-face interaction between the RD and the patient, which allows for real-time exchange of information and the opportunity for multiple individuals to participate. It allows for scheduling flexibility for both patient and provider and contains costs by eliminating the need for either the patient or the practice to incur the expenses associated with traveling to other geographic locations.
Conclusion

Bariatric surgery providers must continue to meet increasing challenges to facilitate health-related behavior change and promote obesity self-management through evidence-based methods in an efficient and effective manner. Care at a distance or “in absentia” care has the potential to improve patient access to all types of clinicians in any number of settings while offering both a significant cost-benefit to both patient and provider and increased patient and provider satisfaction. The provision of MNT services delivered using advanced technology communications is a unique approach to augmenting the care of the bariatric patient postoperatively. Individuals who are providing telemedicine services should undergo specific training in the nuances of an effective client–provider interaction online. Future research is needed to evaluate the efficacy of MNT provided via telecommunication.

References


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ETHICAL AND LEGAL ISSUES

Heretical Thoughts on the Need for Change in Our Language From Care to Protection From Harm

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The word care frames our profession such that we, our employers, and our patients put great emphasis on the importance of the caring relationship and personality characteristics such as kindness and altruism to nursing. Peirce argues that the word care is limiting and may cause others to view nursing as less than important because anyone can care. Instead, she proposes that care be actualized as the act of preventing harm. Using Aristotle’s (trans. 1980) framework, she outlines the elements needed to redefine care. Peirce concludes with a new definition of care in nursing such that nursing’s primary virtue is to care by keeping the patient from harm through purposeful surveillance; through the creation and sharing of nursing intelligence; and by being responsible for ensuring appropriate, timely action by self or others.

Keywords: care; prevention of harm; framing; virtue ethics

After almost 40 years as a nurse, I still struggle to convince the people that nursing matters—that without good nurses, the health care system is doomed and lives are in danger. In contrast, my experience has been that the general population still believes that any caring individual can be a nurse and that the personality of the nurse is the critical element. This commonplace is reinforced by many of our theories with their focus on relational caring, our employers with their focus on patient satisfaction, and even by ourselves when we describe ourselves primarily through the word care.

Caring theories such as Watson’s (2013) have hijacked our ability to articulate our importance to the health care system; caring is just too nebulous a concept and too common to distinguish our caring from any other profession’s. Watson’s work puts an almost unarguable emphasis on what should be a given for anyone in health care; caring individuals make better professionals, and relational caring is therapeutic. Her current website (watsoncaringscience.org) lists 11 “carative” factors including altruism, loving kindness, faith and hope, and so forth. I would argue that most of the factors listed have more to do with innate personality traits than what is learned in school. And one of these factors, expect miracles, is something most of us can’t accomplish.

In fact, none of us like to deal with noncaring individuals, be they nurses, doctors, or fast-food clerks. Warm, kind individuals make us feel better about ourselves and the world. Warm, kind nurses comfort sick patients and this is a good thing. But is that our essence? Can’t family members, housekeeping staff, and others do the same? If nurses want to matter, then we have to have the language that distinguishes ourselves from all the other caregivers.

Noddings (1984) wrote that there are two forms of caring—natural and ethical. She considered natural care to be just that, natural, whereas ethical care was the more deliberative care. Natural care reflects what we want all people to do and be: to be kind and sensitive and to care...
about us and others. When we consider ethical care, we understand that ethics looks at the right and wrong of the situation and the ways to behave and why; it is deliberative. Ethical care has to be thought through; it is more than personality.

Haight (2012) in a recent book on political thinking, The Righteous Mind, proposes that there are at least five moral foundations to an ethical life. They are fairness, loyalty, authority, sanctity, and care. He writes that we consider fairness to be important to the moral life because it diminishes cheating, loyalty reduces betrayal, authority is necessary to prevent subversion, sanctity averts degradation, and care prevents harm.

Extrapolating Haight’s (2012) work to nursing from politics, care takes on an added dimension. I believe that nurses actualize care through the prevention of harm. If nursing care is the prevention of harm, then it more closely resembles the deliberative ethical care of Noddings (1984) than the relational care of Watson (2013). The prevention of harm also moves care away from a focus on relationship which can’t be easily measured to a more measurable outcome of prevention of harm.

If we say that the primary role of nursing is to prevent harm, then we are acknowledging a significant responsibility for nursing in the health care system. The reality is that without excellent nurses, patients’ lives are at stake, as Aiken and her team (2014) have shown. Nurses understand that it is their knowledge and experience that ensure patient safety. All the doctors’ orders in the world cannot replace one observant nurse. Nurses are critical for the “black swan” events of hospitalization. It is the unexpected and unplanned that endangers patients, not the routine and average. No one can replace nurses when it comes to the 24-hr surveillance of patients in hospitals or the attendance to the whole individual in the outpatient setting. The prevention of harm is our primary responsibility to the health care system and to our patients. Obviously, a therapeutic relationship is important; in fact, it is a baseline expectation, but it is not the distinguishing and most critical factor of nursing care.

None of what I am proposing is startling; in fact, nurses with whom I have shared my thoughts acknowledge the prevention of harm as part of the nursing role but one that has lacked emphasis. How often do we even let the patients know that we just saved them by noting a change and calling their physician? We don’t even talk about our “saves” among ourselves. It is important that we begin to say that nurses are critical to patient care because we anticipate and prevent as well as reduce and remove harm to patients. It is no longer just the caring touch that is important; it is the thinking mind. A caring touch is necessary but not sufficient. Patients deserve more.

Kahneman (2011) talks about the importance of framing in his book, Thinking Fast and Slow. Framing denotes how words prime our associative memory and actions. When we emphasize relational, natural caring over ethical and when we focus on theories such as Watson’s (2013) that articulate the attributes of the nurse rather than focusing on patients and their needs, we are priming our community of interest to view us as nice but not necessary. We see this played out time and time again when the nursing workforce is reduced to save money or when housekeepers are cross-trained to take over nursing duties. The critical importance of nursing to morbidity and mortality is overlooked in part because of the emphasis we place on our role in providing caring relationships.

In a recent classroom exercise, I asked students to choose moral virtues needed for the nurse as a provider of care and for the nurse as a preventer of harm. There was overlap; both listed the need for nurses to be responsible, be capable, and have intellect. Nurses as providers of care were also said to need helpfulness, politeness, and love. When nurses were viewed as preventers of harm, the students felt that they did not need politeness, helpfulness, or love but that they did need logic. The need for logic rather than politeness indicates a stronger framing of the nurse’s role in patient care.

Patients could not help but benefit if we defined the concept of care as the prevention of harm while still emphasizing that nurses need to demonstrate compassion and kindness. Nurses as preventers of harm would be more akin to crime scene investigation agents than foot soldiers following orders. To prevent harm, nurses would have to constantly be on the lookout for changing patient status. The first thing the nurses would have to ask themselves would be what do they have to think about today, not what do they need to do. Changing the words from task to think, from relationships to prevention, would reframe the discussion and give us a way to articulate why nursing is important. I have often said that when I am sick, I want the brightest, most educated nurse taking care of me, and now I can say why. The nurse is there to anticipate and prevent harm, to keep me safe when I am at my most vulnerable, to look out for me when I am alone, and to protect me as only a nurse can.

To prevent harm, we do need caring, kind, compassionate individuals, but only those who have the right knowledge and can ensure the right consequences.
I propose that Aristotle’s (trans. 1980) virtue ethics provides a framework for the nursing theory of prevention of harm as an expression of nursing care. Aristotle wrote that virtue ethics required arête, phronesis, and eudaimonia. Roughly translated, the baseline necessities are character, practical wisdom, and flourishing or successful action. If nursing’s primary virtue is the prevention of harm, then nurses

- Arête: must anticipate harm
  - To anticipate harm, you have to care that harm could occur to the other person. The nurse must worry about the other. Worry about the other is indicative of moral character.

- Phronesis: must recognize harm
  - Must have the practical, experiential, and educational knowledge to recognize harm or potential harm
  - To recognize harm, the nurse must actively observe and assess each patient to anticipate what could go wrong, not just react when something goes awry. Such surveillance indicates that the nurse is to watch over a person through close and continuous observation for detecting change.
  - Information is the first critical step in the prevention of harm. It is not just enough to observe the patient, but we also need to create and share actionable nursing intelligence based on that surveillance.
  - Nursing intelligence must lead to action. Nursing intelligence is the result of purposeful activity of collection, processing, integration, analysis, and evaluation. It is all information that should be known prior to and during a course of action.

- Eudaimonia: must act to stop or prevent harm
  - Must act to stop or prevent harm and/or help other professionals to stop or prevent harm
  - Such action must be timely and based on sound principle to be considered successful.

Thus, in summary, I propose that nursing’s primary virtue is to care by keeping the patient from harm through purposeful surveillance; the creation and sharing of nursing intelligence; and by being responsible for ensuring appropriate, timely action by self or others.

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The ethical and legal underpinnings of the development of advanced practice nursing are presented in this article. The establishment of nursing knowledge as the basis of the profession is traced through the past 50 years, and a case study is used to highlight the ethical considerations involved in the independent practice of advanced practice nursing.

**Keywords:** nursing ethics; advanced practice nursing; nursing knowledge; case study

The use of the term “profession” was first recorded in the literature in the mid-15th century. The definition ascribed to this term was a learned vocation (Johnson, 1974). Nursing, similar to many other professions fits this description; however, it has not followed the same evolutionary path.

Early scientists made observations of the environment and uncovered relationships between man and the universe. As a result of selected phenomena, independent and distinct fields of inquiry were established. Within each field of inquiry, the observations and interpretations developed into a new body of theoretical knowledge, and a new science was established. Chemistry and astronomy developed from an interest in metals and heavenly bodies, whereas medicine and physics developed from an interest in natural phenomena. As time went on, the study of man and his behavior led to the development of psychology and sociology (Johnson, 1974). Although there are mostly distinct bodies of knowledge designated for the various sciences, some overlap of material does exist. It is the distinct perspective of each discipline that differentiates one from another. The unique perspective of the discipline drives the continued growth of its knowledge base. The development of professional disciplines has followed a similar pattern, that is, “gradual growth of knowledge through the study of selected phenomena from a distinctive perspective” (Johnson, 1974, p. 373). In addition to the specific perspectives of the profession, the direction of growth has also been governed by social decisions about the profession’s area of responsibility. In other words, what social function does the profession fulfill? Once this social function is identified, the development of the technological and theoretical means to accomplish this function is essential. In the case of medicine, its social function has been identified as “to free mankind from the ills of the flesh” (Johnson, 1974, p. 373). To this end, physicians have produced a large body of knowledge, both theoretical and practical, that describes and explains the disorders of man’s biological being and developed methods to manage and prevent them. The knowledge physicians have of illness, its causes, and the means to eliminate or manage its consequences is highly valued because it affects the well-being of society.

The development of the profession of nursing did not follow that of other professional disciplines, although they shared a common origin as a learned vocation. Historically, the caring functions associated with nurses were considered to be extensions of the obligations of mothers and wives for which a vast professional knowledge base was not required. Florence Nightingale, the founder of modern nursing, focused on the concepts of hygiene, nutrition, and rest in caring...
for patients; however, the lack of a specific associated
body of knowledge allowed nursing to be viewed as a
subordinate category of labor as opposed to a distinct
states that any occupational group whose members
hope to achieve the status of a profession must fulfill
two major criteria. The first criterion is an institution-
ized goal or social mission. Learned professions, such
as nursing, are sanctioned and valued by society for two
reasons:

(a) The services learned professionals render are
judged to be essential and beneficial for all members
of society during particular times in their lives, and
(b) members of each learned profession have identi-
ified and come to a consensus about the knowledge
that practitioners must master and use selectively,
creatively, humanely, effectively, and ethically in
providing those essential services. (Schlotfeldt,
2013, p. 16)

The second criterion is the continued advancement
of knowledge to improve practice. It was not until ap-
proximately 50 years ago that these essential criteria
were addressed by nursing. At that time, Fawcett (1983)
explains, there arose a general agreement that “nursing’s
social mission is to appraise and assist human beings in
their quest to optimize their health status, health assets,
and health potential” (Fawcett, 1983, p. 14). Nursing as
a profession has a social mandate to contribute to the
good of society. “The practice of nursing is intentional
and deliberate action . . . performed by nurses, and in-
tended for the benefit of persons and society. In this
regard, it is comparable to other professional practices”
(Cody, 2013, p. 9). This social responsibility has evolved
tremendously since the time of Florence Nightingale.
The methods nurses used to address the needs of their
patients have matured and advanced through the years
conceptually and technologically. In addition, nurses
have become aware of larger forces that impact on their
relationship with their patients. This awareness has ex-
panded their focus not only to the individual nurse–
patient relationship but also to the broader context in
which nursing and health care take place. A growing
understanding of the sociopolitical environment in
which nursing functions has furthered nursing’s social
mandate to address the health disparities that exist in
society (Roy, 2007).

To further support the mission Fawcett (1983) stated
earlier, it was also recognized by nursing that a repre-
sentative body of structured knowledge was essential
(Cody, 2013). Over the past decades, a domain of human
knowledge specific to the discipline of nursing has been
identified and categorized in the formation of nursing
theory. The strength of a theory is proportionate to the
breadth of events and situations that it can encompass.
Many frameworks of nursing have been developed that
have the ability to guide nursing practice across a range
of events and situations, which reflect the maturity of
the knowledge base of nursing. Roy (2007) describes
the development of these frameworks as paradigms
used for the advancement of knowledge for practice.
These paradigms were presented and discussed in the
growing body of nursing literature. Nursing journals
were established by nursing leaders, academic nursing
faculty, and honor societies both nationally and interna-
tionally, which published these conceptual frameworks
and theories and thus encouraged further analysis and
growth. The expanding nursing literature identified a
focus on the substance of knowledge required for prac-
tice as the scientific and philosophical principles regard-
ing the patterns and processes of persons in interaction
with the environment to promote health.

Continued advancement of knowledge to improve
practice, the second criterion necessary to achieve status
as a profession, was accomplished through nursing re-
search. The scientific concepts and philosophical foun-
dations of knowledge development in nursing were
further advanced by the introduction of new methods
of scientific inquiry. Increasing their depth and breadth
and attention to the multiple perspectives of practice
and expanded research approaches have contributed
to testing and creating theories. Research has also pro-
vided empiric findings, which have provided the basis
for clinical practice guidelines and interventions as well.
In summary, the evolution of nursing as described ear-
erlier with its focus on knowledge development, advance-
ment of methodologic inquiry, and expanded awareness
of its sociopolitical commitments has shown it to be a
strong professional discipline.

Indeed, the practice of the profession of nursing
has progressed along with its theoretical underpin-
ings. The scope of the nurse’s responsibilities has ex-
panded in response to advances in technology as well
as to societal needs. Because health care became a more
complicated and varied social enterprise, the indepen-
dence of nurses grew. Nurses were given the respon-
sibility for a variety of actions previously restricted to
physicians (Risjord, 2010). As a result, nurses expanded
their roles to meet the needs of diverse populations and
communities. Advanced practice nursing is defined by

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the International Council of Nursing (ICN) as “the application of an expanded range of practical, theoretical, and research-based therapeutics to phenomena experienced by patients within a specialized clinical area of the larger discipline of nursing” (Grace, 2013a, p. 98). Although in England and Europe advanced nursing roles have existed for many years, in the United States, the first officially designated advanced practice role, the nurse practitioner (NP) arose in the mid-1960s (Grace, 2013a). The role of the NP was a response to increased medical specialization and the lack of access to medical care (Furlong & Smith, 2005). Advanced practice nurses (APNs) practice in a variety of settings, and their development evolved in response to various political, social, and economic factors. Integral in the development of the role of the APN are the following: the sociopolitical environment, unmet health needs in society, a limited health care workforce to address the needs of patients, a changing supply and demand calculus, increasing governmental policy, support and awareness, greater inter-/intraprofessional collaboration, and development of state-of-the-art and empirically based nursing education and documentation (Ketefian, Redman, Hanucharurnkul, Masterson, & Neves, 2001). These factors strengthened and justified the continued definition of the advanced practice role.

In addition to the support of the government through federal funding and policy came the creation and support of national nursing organizations. The American Nurses’ Association and its state constituent organizations facilitated the APNs’ practice by establishing legal recognition of their advanced practice roles. For APNs, law has been an ally in pursuit of independence. This recognition helped advance efforts to establish legislation, standards, and certification. Although the regulation of advanced practice nursing is accomplished on a state-by-state basis, there is general recognition of the expanded scope of clinical practice, which importantly includes both prescriptive privileges and reimbursement.

The demonstration of the APN to provide cost-effective quality care has opened up public and private insurance markets, further supporting this role (Ahmed & Wolf, 2013). Similar legislation and policies were developed in other countries where APNs now function more independently within a defined scope of practice. The National Council on Nursing in Ireland describes advanced practice nursing as “carried out by autonomous experienced practitioners who are competent, accountable, and responsible for their own practice. They further outline the core concepts of the APN as autonomy in clinical practice, pioneering professional and clinical leadership, expert practitioner, and researcher” (Furlong & Smith, 2005, p. 1061).

Given the development of nursing as a professional discipline, its distinct body of knowledge, and the forces behind the expanded and autonomous role of the APN, the role of an APN can now justifiably be analyzed from an ethical and/or legal perspective.

“Ethics, as a field of inquiry, studies the foundation for distinguishing good from bad and right from wrong in human action. The theoretical interest is concerned with knowing; the practical interest is concerned with doing” (Grace, 2013b, p. 13). Ethics and morals are often used interchangeably, although ethics is concerned with understanding human values, whereas morals refer to personal conduct that reflects personal values. In ethics “good” as a descriptive term can be historical, sociological, or anthropological; however, good as a prescriptive is an injunction to do something. If an action is defined as good, then one should also ask the next question as a logical extension which is the “ought.” What is it about advanced practice nursing that qualifies it as a practice that we ought to pursue? The interface between ethics and advanced practice nursing revolves around the question, what is good for human beings or addresses the greater societal question of how we can promote better health?

Nursing, as identified by its code of ethics, strives to further the health and well-being of specific persons or populations. It is valued by society by virtue of the fact that it, as a profession, has been recognized to provide an essential and beneficial service responsible for conserving life, alleviating suffering, and promoting health. As a result of sociopolitical, economic, and health care workforce issues, health care services, historically, have not been available to all persons, thereby creating an issue of inequitable access to necessary services by what might be considered at least in part more vulnerable populations. The creation of APNs served to fill the void. Very few social changes or laws are agreeable to or advance the welfare of all individuals alike (Hart, 2012). The provision of quality health care by APNs has served to reverse the inequality that existed, contribute to the general welfare of society, and return the status quo to individuals.

Health is a recurring need of society, which must be optimized to promote success in societal life. The APN has the ability to independently address this
need in areas where gaps in health care existed. Hart (2012) in his work, *The Concept of Law*, states,

The connection between socially recognized ideals and virtues and the primary mandatory forms of social obligation and duty is fairly clear. Many moral virtues are qualities consisting in the ability and disposition to carry forward beyond the limited extent which duty demands, the kinds of concern for others’ interests or sacrifice of personal interest which it does demand.” (p. 182)

Advanced practice nursing fulfills these social obligations and duties and as such demonstrate its ethical/moral justification.

Law, simply defined, is a means of social control. The intersection between morality and law is associated with the term justice. Justice comprises one element of morality, which addresses the ways in which classes of individuals are treated (Hart, 2012). “Justice as a principle in health care ethics refers to fairness, treating people equally and without prejudice, and the equitable distribution of benefits and burdens” (Kjervik, 2010, p. 33).

The history of the development of the role of the APN (Grace, 2013a) has illustrated its commitment to providing care to the underserved. The geographical and specialty areas where shortages of medical providers existed were staffed by APNs. APNs used their expert knowledge base, complex decision making skills, and clinical competencies for expanded practice to address the varied health care needs of society, thereby allowing for access to health care services by persons who would otherwise not have the access. In this way, one can say that this notion of the principle of justice has been satisfied.

Ethical principles not only provide the justification for the role of the APN but also provide guidance and insights that help define necessary elements to be considered in patient interactions. The professional ethical principles identified by Beauchamp and Childress as pertinent to health care are autonomy, beneficence, nonmaleficence, and justice. APNs are mandated to determine which of these principles apply in a given situation and whether insight about a dilemma can be provided by these principles (Grace, 2013b). In representing the interests of their patients relative to these principles, the APN serves to be an advocate for the patient.

Concretely, autonomy in health care is understood to mean that a patient has the right to determine for himself or herself what is considered to be an acceptable treatment for them and with whom their medical information may be shared. Honoring autonomy means the APN must evaluate the information the patient needs and assist them in understanding the relevant information so that they can make an informed decision. An essential component of the patient’s right to self-determination is the principle of the patient’s decision-making capacity. Guidelines have been proposed to facilitate judgments about a patient’s ability to provide informed consent that is decision-specific. To this end, the medical provider can use this framework to identify the presence of the characteristics necessary for competent decisional capacity. Appropriately determining when a patient has decisional capacity to make an informed decision is fundamental to the obligation of patient–provider relationship, in this case, the APN and his or her patient.

Nonmaleficence is associated with the concept of “above all do no harm” (Grace, 2013b, p. 27). Harm can result from action or inaction; it can be intentional or unintentional. This concept is often associated with the APNs’ accountability for their action and medical decisions. The APN must anticipate any foreseeable harm that may be a consequence of a medical decision and work to reverse or minimize the harms as best as possible. In legal terms, nonmaleficence is considered a duty of due care. Due care is defined as taking appropriate and sufficient care to avoid causing harm as the circumstances demand of a prudent and reasonable person (Grace, 2013b). The ethical principle of nonmaleficence for the APN as a licensed medical provider is the same standard to which the physician is also accountable.

Beneficence is considered the duty to provide a good or to benefit others. In health care, it is defined as the duty to maximize benefit to patients and minimize harm. It connotes a more active role on the part of the APN—one of commission of good versus omission of bad. On the individual level, the focus is on what is good for the individual patient; however, more broadly, it relates to furthering the general health of society. The concept of justice, as discussed earlier, is associated with fairness. Inequities in society should be identified and the APN should address them. Those most vulnerable, whether it is because of their limited health or resources, should receive attention to restore them to a level equal to their peers. In areas where there is a general scarcity of resources, the APN can function to provide care so as to equalize benefit to society.

In clinical practice, the APN synthesizes these ethical principles to address and resolve complex practice
dilemmas. What follows is an illustrative case that highlights the role of the APN and the relevant ethical principles.

B. B. is a 10-month-old infant followed in the pediatric clinic. Routine laboratory work was ordered to assess the patient for possible anemia. The results indicated a mild anemia and the infant received treatment. On follow-up of the anemia, despite assurances of compliance with the treatment regimen, repeat laboratory work did not show an improvement. Additional laboratory work was ordered to identify any other etiology of the anemia. A minor genetic condition (a carrier state of a hemoglobinopathy) was identified, which explained the lack of response to the treatment. This obviated the need for further treatment because further medication would not serve to improve the presence of the mild anemia. In light of this genetic condition, the infant's mother was counseled about the condition and the implications it might have on her future pregnancies if she was also a carrier of this disorder. It was recommended that if the opportunity arose for her to have laboratory work done, a test for this condition would provide important information. Testing the infant's father was also suggested; however, he was not available. Very soon thereafter, the infant's mother did indeed have blood testing done to rule out this condition; however, the results were not consistent with the infant's results. In fact, the results showed that the mother did not contribute genetic material for the genetic disorder found in the infant. To eliminate the rare possibility of errors in the tests of both individuals, repeat testing was done with the same results. How was this possible? If not possible, what are the ramifications of these results? Were these two individuals actually related? How could this be confirmed or refuted? To address these questions, a genetics specialist and a hematologist were consulted. The likelihood that this situation could occur in reality was so rare as to be theoretical. The alternative solution to this problem was that the mother did not give birth to this infant but was discharged from the hospital with an infant that was not hers. The clinical, ethical, and societal issues raised by this dilemma, that is, what is the medical explanation for these clinical findings, whose child is this infant, and how do we address the possibility of a “switch” at birth, were very serious. The APN needed to review with the mother the information she needed to understand the clinical problem so that she could make an informed choice about what testing might be required, what further testing might reveal, and who should be involved in this investigative process. The APN also coordinated the specialty consultations so as to assure adequate cooperation and collaboration by all the medical providers.

The potential harm from the repeated laboratory work and the tremendous societal ill of the possible switch of infants presented a great challenge. To reverse these harms, a complex process of collaboration was initiated by the APN. The geneticist suggested that further genetic and chromosomal studies be performed to identify markers, which could link the infant and her mother. These studies were very costly and were not covered by the mother's health insurance. The risk management department of the institution where the infant was born was contacted. The clinical situation was explained in depth with assistance from the hematologist and geneticist. The institution decided that it was imperative that further testing be done to identify whether a switch of infants occurred. The APN suggested that because the patient's insurance would not cover the expensive and highly specialized testing, the institution should cover the cost. It was agreed that the testing should not be a burden to the mother but rather the institution would assume this responsibility. The additional studies were performed, and it was confirmed that the mother and infant were in fact related and that a rare occurrence of uniparental disomy (both copies of genetic material for a characteristic provided by one parent) had taken place. A figurative reunion of this pair as a result of the testing took place, which provided a great individual and societal benefit.

The ethical principles, which direct the actions of APNs were evident in this case and guided the provider in providing excellent patient care, enabled successful interprofessional collaboration, and touched on furthering scientific research. To be specific, consider the following:

Autonomy of the mother was maintained by providing her with adequate information and explanation to understand the complexities of the situation, thereby allowing her to make informed choices at each critical decision point. In addition, the autonomy of the APN's role contributed to choice of medical treatment options, appropriate diagnostic testing, collaboration with consultants, and direction in a sensitive and relevant plan of care.

Nonmaleficence presented the greatest challenge in this case; however, the APN was able to prevent the unnecessary medical treatment and repeated testing of the infant, thereby minimizing harm to the infant imposed by unnecessary treatment. In addition, the APN
was able to facilitate a plan of care that minimized the harm from the potential issue of the switch of the infant.

Beneficence was portrayed by the good outcome for the patient in identifying the rare and thankfully benign condition of uniparental disomy and for society by confirming that a grave error had not occurred, which would have caused much human suffering.

Justice was accomplished in this case when the APN advocated for the patient in the matter of the costly chromosomal studies. The mother’s lack of resources was a barrier to her receiving the necessary care. The institution was persuaded to share their available resources so that the mother could have access to the recommended testing.

The APN role is a nursing role that is indeed distinguishable from other nursing roles by the breadth and depth of responsibility to patients. Its expanded role is characterized by its expert knowledge base, complex decision-making skills, clinical competencies, and a code of ethics to which the APN is bound. The role serves to allow greater access to health care, which serves the interest of not only the individual as a patient but also ultimately the greater societal good.

References


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A Parallel Strategy: Deliberate Inclusion of Trained Traditional Birth Attendants in Maternal and Child Health Workforce of Low-Income Countries

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The authors propose an interim parallel strategy for the thoughtful inclusion of trained traditional birth attendants (TTBAs) in the maternal and child health (MCH) human resources of low-resource nations to improve safe childbirth. This is in contrast with international policy recommendations that traditional birth attendants (TBAs) be eliminated and replaced by skilled birth attendants (SBAs). Dimensions for critical awareness that should inform global MCH enterprises are identified and elaborated in support of this proposal: omnipresent women’s status, international nursing and midwifery standards, ethnographic values and strategies, local government roles, culturally specific birthing expectations, and the realities of current MCH human resources infrastructures.

Keywords: midwife; traditional birth attendant; maternal–child health; safe motherhood; global health

Growing opportunities to participate in global maternal and child health (MCH) initiatives intrigue many advanced practice nurses (APNs) and certified nurse-midwives (CNMs). These ventures are supported by the National Organization of Nurse Practitioner Faculties (NONPF), specialty nurse practitioner professional associations, and the American College of Nurse-Midwives (ACNM). Initiatives have been accelerated by rapidly increasing prospects for efficient and dependable worldwide communication. Beyond the individual clinicians’ motivations of overarching altruism and the draw of specific project content associated with global projects, international collaborative work demands a more universal critical awareness on several dimensions. Effective impact requires consciousness of these dimensions in the United States and worldwide. The purpose of this article is to articulate these dimensions and then to apply them to one particularly challenging MCH workforce problem in low-resource regions and to suggest a promising but overlooked solution.

The dimensions for critical awareness that should inform global MCH enterprises include omnipresent women’s status, international nursing and midwifery standards, ethnographic values and strategies, local government roles, culturally specific birthing expectations, and the realities of current maternal–child health human resources infrastructures. There is complex interplay among all of these. Although these dimensions cross specialty practice areas, their application in this article will be limited to the issue of safe childbirth. The focus will be on applying the critical dimensions to one particular global dilemma and to the proposal...
of an innovative strategy that is especially germane to midwifery and all reproductive health practices. Critical awareness across the identified dimensions comes into sharp focus around the underaddressed issue of traditional birth attendants (TBAs). In contrast with widespread recommendations of the World Health Organization and other respected international professional policymakers that TBAs be eliminated and replaced by skilled birth attendants (SBAs), we propose an interim parallel strategy for the thoughtful inclusion of TBAs in the MCH human resources of low-resource nations. We argue that this approach is crucial and pivotal during the long, transitional years that will precede realization of global professionalization goals currently predicated on the eradication of TBAs and the use of only SBAs and professionally educated CNM/certified midwives (CMs) and physicians. We provide the paradigm example of one health care system in Bangladesh, which has implemented training and integration of TBAs into maternal care.

**Status of Women**

Critical awareness begins within the context of the global status of women, its common features across nations, and its relationship to birthing. Women as oppressed groups are a universal phenomenon as is the potential for support and change when the subjugated have opportunities to communicate and interact. International Women’s Day has been celebrated since 1911 but only marked by the United Nations (UN) since 1975. At the 39th annual celebration in March 2014, UN Secretary General Ban Ki-moon underscored that “...equality for women means progress for all...” (https://www.un.org/womenwatch/feature/iwd/). Yet progress requires constant vigilance and visibility everywhere. It is not uncommon for pregnant women in labor to be bullied in the forms of verbal and physical abuse in present day hospital-based birth settings, including those in nations designated as world leaders such as the United States. The power of medical authority in the hospital hierarchy creates a ripe environment for abusive behavior to occur (Hodges, 2009). In much of the developing world, poor, uneducated women have never been a priority either in their own countries or to the consulting nations that are donating advice and technical expertise (Kristof & WuDunn, 2009). Fears of abuse by hospital personnel, for example, have thwarted programs created to bring more poor women into hospital maternity units in India (Singh, 2010) and Kenya (Essendi, Mills, & Fotso, 2010). It is crucial to identify these similarities of women’s experiences and responses across national borders to develop a wide base of empathy.

This is foundational to the creation of universal impetus and strategies for change in women’s status and power. Transformation of childbirthing into an experience that builds confidence and assertiveness will have pervasive effect on women’s family relationships and an undulating effect into positive social and economic changes. Since 1982, ACNM’s Department of Global Outreach has provided technical assistance in more than 30 countries in Africa, Asia, Latin America, and Eurasia including Ghana, Ethiopia, Malawi, Pakistan, Uganda, Zimbabwe, Zambia, Senegal, Eritrea, Tanzania, Morocco, Indonesia, and Afghanistan (Kennedy, Stalls, Kaplan, Grenier, & Fujioka, 2012). The ACNM Life Saving Skills (LSS) modules are increasingly requested by government agencies and provide realistic and graphic depictions of clinical situations, problems, assessment, and intervention that are specifically designed to be understood by low-literacy populations (ACNM, 2008).

**International Nursing and Midwifery Standards and One Important Gap**

A second critical dimension for international collaborative work is development and application of reality-based professional standards. The International Confederation of Midwives (ICM, 2010) recently completed international standards for education requirements for midwives, which include 3 years of formal study. In developing countries, the infrastructure of MCH providers is predominantly informally educated TBAs who attend the vast majority of births that occur in the world (Sibley, Sipe, & Barry, 2012). Indigenous TBAs are not included within these ICM standards, which are geared toward a future-oriented, ideal, and necessary vision. The unspoken dilemma is that as a stand-alone strategy, this vision will not be realized quickly enough to meet the current and foreseeable needs in low-resource countries. Women in the most remote regions will be unable to access educated midwives or even SBAs or emergency obstetrical care (EmOC) facilities and will continue to be at the highest risk for maternal mortality (Prata et al., 2011). Excluding TBAs from MCH, human resources will prolong a dangerous and unfillable gap in MCH services. The ICM needs to develop a parallel strategy to ensure that existing TBAs are not summarily eradicated in the process of professionalizing midwifery.
The parallel strategy is to establish training programs within integrated systems of maternity care and to include trained TBAs (which have been called TTBAs) as an acknowledged component of the maternity care team. An important preliminary step in the development of this parallel strategy of inclusion of TTBAs is understanding the historical and current roles, sociological status, and skill levels of the presently invisible and silenced TBAs.

**Ethnographic Values and Research Strategies**

As an educator and program director, the lead author (LZ) knows well that many of our midwifery students express interest in providing direct professional service in developing countries, and the second author (MWB) has supervised pediatric and neonatal faculty and graduate students in MCH projects where the study question and data were based in such countries. Guidance of effective collaborations with another nation and culture mandates an ethnographic approach. Its essence is understanding and preservation of the so-called native perspective or viewpoint of participants within the culture, that is, the “emic” system of norms, values, and standards that direct behavior, as emphasized in the classic historical primers of ethnographic methodology (Spradley, 1979, 1980). In the context of international clinical mentoring, visiting consultants have been urged to “… gain understanding of cultural experience and meaning applied by different populations to their (health care experiences) …” (Ng’ang’a, Byrne, & Anh Ngo, 2014). Ethnographic recording can make visible and preserve the extensive knowledge nurses quietly amass relative to selected populations they serve intensively over time, knowledge that otherwise will be lost (Byrne, 2003). As CNM/CMs and APNs who are educated in a multidisciplinary curriculum, we must integrate the knowledge we have from social sciences including anthropology into any consultation in which we participate.

Ethnographic research is an essential knowledge-building and implementation strategy emanating from this general ethnographic approach. Globally, there do not appear to be any systematic record of ethnographic interviews of TTBAs conducted by clinicians in any countries. In a recent trip to Bangladesh as part of a clinical project that the lead author (LZ) had been invited to develop to improve childbirth safety in that country, she initiated an ethnographic study designed with the coauthor (MWB), a doctorally prepared ethnographer. Following informed consent, the approach included participant observations and in-depth interviewing of the dais (Bangladeshi word for TBA). Dais enthusiastically shared their histories of occupational entry, home birth practices, challenges, and perceived needs. These interviews were conducted within women’s domain in clinic courtyards accompanied by an interpreter who is Bangladeshi and also a doctoral candidate in anthropology. Observations were made during clinic trainings and home visits. Additional documentation was recorded through a field journal, photography, and videography by the lead author (LZ) and an additional midwife on the visiting consultant team.

Eliciting the stories and perspectives of TTBAs creates an important resource from which to understand their role from their perspective. This vital work needs to be done to assess the range of current influences that impact typical childbirth experiences in low-resource regions. Evidence from this perspective is sorely lacking for urban institutions that offer childbirth services, and there is virtually no data for the abundance of home births or for the most remote locales. In countries where equality of women is not a given, it is essential to bridge the gap between childbirth experiences of women, the full range of childbirth providers, and government agencies. This cannot be done until the voices of all childbearing women and all providers are added to the discourse.

**Local Government Roles**

Another component necessary to develop a parallel strategy of improving MCH services is to retain a healthy awareness of government programs which may be far removed from the realities of childbirth services of their developing countries. This will require a critical examination of each country’s MCH system to ensure that all levels of MCH providers are included in strategies for improvement. Governments are scrambling to meet Millennium Development Goal (MDG) 5 of decreasing maternal mortality ratio (MMR) by three-quarters between 1990 and 2015. Achievement will increase the successful countries’ access to development funding sources (UN, 2012). This fiscal motivation is important but does not ensure that the projects chosen will be translated into practices that impact maternal morbidity and mortality outcomes. It is often government agencies that fund and direct the projects that ACNM and other visiting donors promote.

U.S. CNMs/CMs’ access to higher level MCH policymakers may give us a false sense of influence, which
we do not enjoy at home. CNMs/CMs who work in global health often work more closely with government health ministries and policymakers than with local communities, including MCH health care providers and TTBA. In the United States, the same CNMs/CMs are less likely to communicate with health care policymakers and are more likely to initiate change in local community and at the hospital level. Critical awareness in participating in global health initiatives begins with recognizing that we may be not be listening to voices of women but rather to people in power who are not aware of the best ways to sustain needed changes in MCH health care services. Decisions made only at a government policy level have potential for misunderstanding and miscommunication.

If CNMs/CMs in the United States were the “recipients” of well-meaning technical assistance from another country, we would certainly want to be central to the components of the assistance. In the world of saving lives of mothers in childbirth, it is crucial that all key players are involved. We would argue that the key players are the pregnant women, family members, others traditionally involved in birthing, and, where available, paraprofessional and professional health providers. CNMs/CMs must avoid participating globally in a top-down approach. Midwives should hesitate to offer technical expertise if it does not include the reality of childbirth as a social event, a phenomenon shaped by each culture but always resonant with all midwifery practice. ACNM needs to direct attention to including TBAs in technical assistance projects. TBAs are the world’s most numerous childbirth providers and must be involved in official assessments of national MCH needs, decision making, and trainings.

Culturally Specific Birthing Expectations

Two examples reported in lay media are offered to provide exemplars of how the key players in low-resource nations can be identified and incorporated into maternity care decision making. In a recent New York Times blog by Courtney Martin (2013) about safe childbirth strategies in Malawi, the contributing writer describes an “organizational and attitudinal transformation” that is in process. Groups called “safe motherhood committees” have been organized and are composed of influential community members. An interesting new role introduced on the committee is that of “secret mother.” The secret mother is an elder who serves as a liaison between the pregnant woman and the formal health care workforce. This connects the cultural requirement that the pregnancy is revealed only to the pregnant woman’s mother with the need for pregnancy care to be provided early and by family outsiders.

Similar deliberate work to transform family attitudes occurs in Bangladesh where “mother-in-law/daughter-in-law festivals” have been created and introduced by Gonoshasthaya Kendra, a national public health system that serves 1 million people in Bangladesh (Chowdhury & Chowdhury, 2008). The purpose of these village festivals is to improve communication and family awareness about the social and physiologic needs to promote a healthy pregnancy, birth, and baby. The mother-in-law in Bangladesh has strong influence in decisions involving the daughter-in-law, which range from nutrition and work during pregnancy to decisions to transfer for medical assistance in labor. Acknowledging the mother-in-law as key player also leads to incorporating her into supporting and advocating for appropriate health interventions for the pregnant daughter-in-law and reducing harmful practices of overwork, undernutrition, and disrespect.

Realities of Current Maternal and Child Health Human Resources Infrastructures

Why TTBA Are Needed

In developing countries, there is a built-in infrastructure of TBAs who are trusted and respected citizens in local communities, both rural and urban. When trained, they are in a key position to bridge the human resources gap during the next two decades while strategies to educate and introduce more SBAs and midwives are being slowly developed and expanded. Women all over the world seek guidance in pregnancy and childbirth from those they identify as trustworthy. The more remote and underresourced a place is, the more likely it will contain a cadre of TBAs with generations of home birthing experience, established local regard, and ready availability where services are needed.

TBAs continue to attend nearly 80% of births in the home even though there has been a concerted global policy effort to institutionalize birth. Many women continue to fear and avoid institutional births because of the less compassionate practices they hear about or personally experience within the hospital, the association of hospitalization with morbidity and unexpected surgery, and the culturally jarring notion of isolation from family during childbirth (Essendi et al., 2010; Hulton, Matthews, & Stones, 2000). Three crucial
delays to emergency obstetric care which place a mother and baby at risk of death have been long established: (a) deciding when to seek medical care; (b) reaching the facility, including financial cost and transportation to the facility; and (c) accessing adequate medical care within the facility (Thaddeus & Maine, 1994). Notably, barriers to adequate maternal care within facilities continue to contribute heavily to maternal death (Knight, Self, & Kennedy, 2013). All three delays can be minimized through thoughtful inclusion of TTBAs in a health care team that promotes safety of mother and baby within socially acceptable norms.

An Integrated TTBA Model From Gonoshasthaya Kendra in Bangladesh

Gonoshasthaya Kendra (GK), the People's Health Center, is a national health service delivery organization that serves 1.2 million people throughout 600 villages in Bangladesh. GK was founded in 1972 by a group of young doctors who had been involved in creating the Bangladesh Field Hospital to serve wounded freedom fighters and refugees during the war of independence in 1971 (Chowdhury & Chowdhury, 2008). During the following four decades, GK has been developed into an integrated system that includes education, nutrition, agriculture, environment, herbal medicinal plant research, income generation, and vocational training. GK has corralled social determinants to support primary health care, including women's rights through education and raising the marriage age, economic emancipation, social awareness against violence, environmental protection, and disaster relief and preparedness, all in the context of national pride.

From its founding, GK has specifically recognized the vital role of TBAs to MCH in Bangladesh and worked to improve their status, knowledge, and skills. GK has emphasized and conducted regular trainings every few months for the more than 1,000 TTBAs that serve the GK families. The primary strategies have been to minimize the three delays by teaching recognition of morbidity in pregnancy, labor, and birth; influencing family members to actively participate in timely decisions for transfer to a health care facility when indicated and expediting the transport; and communicating appropriately and regularly with community and hospital medical personnel.

The social values of GK emphasize respectful human relationships that build integrity. This provides the foundation for effective TBA training and for family and team communication and decision making when it comes to recognizing danger signs during labor and postpartum. The lifesaving skills trainings are conducted in a welcoming and respectful social environment that recognizes the revered position of the TTBA within the community. In spite of illiteracy, the opinions and clinical experiences of the TTBAs are included as a valuable verbal and interactional component of the teaching discourse. The TTBAs have direct communication to the medical director of GK by mobile phone. The doctors speak with the TTBAs and listen to their assessments. Their recognition of danger signs is taken seriously and allows for effective and timely transfer within an available comprehensive health care system. Such a common sense approach may contribute to the lower maternal mortality rate at GK, where MDG 5, a three-quarter reduction of MMR from the years 1990 to 2015, has been reached or surpassed annually since 2008 (Byrne & Kadir, 2014).

TBAs in low-resource countries are of a low social status, yet within their own communities, they are revered. This dichotomy is understood by GK and has been challenged using the egalitarian approach to health care providers that includes TTBAs. It is unlikely that government health ministers, public health leaders, and policymakers have ever had any social contact with TBAs. This makes invisible a valuable human resource for maternal health care. The oversight can be rectified with careful planning to recognize and raise the status of the TBAs who are the attendants for the vast majority of births in low-resource countries.

Conclusion

In a larger response to maternity care in low-resource countries, the deliberate training of TBAs and their integration into a cohesive health care system are urgently needed at this time.

Training existing community-based birth attendants (TTBAs) as part of a larger health team creates the essential link that uses the TBAs’ intimacy with the people while providing them with better skills to enhance safe prenatal, parturient, and postpartum health care.

With increased opportunities to engage in global health initiatives, we must avoid the risks of well-intentioned but short-sighted and ethnocentric efforts. One immediate strategy that should be embraced is the deliberate training and integration of TBAs rather than their abrupt eradication. Failure to use this
interim approach will leave behind greater chaos and endangerment to the very women we hoped to serve through our global initiatives.

References


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Dr. Jeffrey Brenner, MD, is a family physician who has worked in Camden, New Jersey, for the past 15 years. Dr. Brenner owned and operated a solo practice, urban family medicine office that provided full-spectrum family health services to a largely Hispanic Medicaid population. His clinical practice included delivering babies, caring for children and adults, and doing home visits. Recognizing the need for a new way for hospitals, providers, and community residents to collaborate, he founded and has served as the executive director of the Camden Coalition of Healthcare Providers since 2003.

Through the Camden Coalition, local stakeholders are working to build an integrated, health delivery model to provide better care for Camden City residents. Dr. Brenner’s work has been profiled by Dr. Atul Gawande in an article in *The New Yorker* entitled, “The Hot Spotters” (January 24, 2011) and in an episode of PBS’s *Frontline* (July 27, 2011). In 2013, he received a MacArthur award. Dr. Brenner is the medical director of the Urban Health Institute, a dedicated business unit at the Cooper Health System that is focused on improving care for the underserved. Using modern business techniques, they are redesigning long-standing clinical care models to deliver better care at lower cost (Brenner, personal communication, 2014). I had the opportunity to interview Dr. Brenner for this issue of “Dialogues” and am honored to share his insights regarding health care delivery and his vision and effort to change the system. I hope this dialogue serves as a basis for considering your own vision and initiative.

**C. Reinisch:** What motivated you to develop the Coalition? How has your work with the Camden Coalition of Healthcare Providers evolved and expanded over the years?

**J. Brenner:** The motivation came from the frustration of being a frontline care provider. There are so many challenges to caring for sick patients. You refer a patient for specialty care and it would result in hospitalization and not the best care. Medicaid does not meet the needs of the sick patients I work with. This started as a health provider breakfast group for 3 years. It was the opportunity to talk about the challenges in caring for patients in Camden and figure out a way to better organize primary care providers. There was no specific vision at the time we started this process; it was just a way to communicate and develop connections. I am sometimes amazed that people now care about what we are doing here in Camden.

Breaking health care information down into lean steps and challenging strategies is difficult. Public health often gets stuck in the planning work or doing ineffective things. Community health is 50 years behind in development. The discipline is in its infancy. There is a lack of change theory or model to lead and structure the work. Population health is absent of frameworks. There is a need for meaningful intellectual and data models.

For example, care management has various meanings depending on who is defining it. There is a difference from United Health Care’s definition as compared to a
psychiatric model or an LPN knocking on doors accompanying patients to appointments. The variation demonstrates the lack of structure we have in population health.

C. Reinisch: It is said that you are revolutionizing health care with your cooperative approach to care. What do you consider your most important contributions?

J. Brenner: I would say the biggest contribution is the development of new symbols, terms, and the development of frameworks. Public health and community health get stuck at times doing the same ineffective work. We are a living, innovative laboratory that can try out new models, fail at some, and cycle through to the next process.

Public health has three frameworks for care: taking care of healthy people, which is primary prevention; caring for those with a known condition to be healthy is secondary prevention. Rehabilitating the sick is tertiary prevention.

Which group has the best return on investment (ROI)? We don't know. Public health is presently focused on primary prevention, but we won't know what the ROI is on that group for 20 years. It takes that amount of time for the negative behaviors to have an impact on health.

Policy that affects behavior change and cultural norms are the only things that are effective. That would be seatbelt laws and smoking laws. We have poor evidence for education programs. We don't know how to change behaviors. We have difficulty changing behaviors.

Secondary prevention allows for the checking off of process boxes. We ask patients with diabetes to weight themselves. We have someone making phone calls for follow-up appointments. But is a phone call enough to change behavior? We don't know.

Primary and secondary preventions require good predictive models. We don't have great models. Lots of money is being spent on models that don't work.

What we are doing is identifying those patients that cost the system the most money. We identify those hospitalized patients and make sure they get great care over the next year. This saves money.

Public health needs to shifts its focus. There is a belief that you can't help the homeless, mentally ill patient with a diabetic foot ulcer. Public health is interested in providing care to healthy people. The sick are the ones who need better quality of care to save the system money.

C. Reinisch: How do you recruit and employ individuals who share your vision?

J. Brenner: We are lucky we have a building of energized people. We presently employ 10 AmeriCorp college graduates each year. These graduates are pre-medicine, prenursing, or pre-public health students who are interested in making a change. They work as community health coaches for 1 year at a time. We are looking to increase the number of AmeriCorp participants we employ.

The job is not easy. It is not glamorous. It is often a transformative experience. I am looking for people that want to go on to do meaningful and great work.

We also spent a lot of time developing our corporate culture of core values. We evaluate our core values, and we put people through a grueling interview process to assure they are in synch with our values. I don't mind people not being here a long time. We accept that this may not be a fit for everyone and we are willing to move on. We view working here as getting a master's degree. It is a learning process. I have external speakers come in so people continue to learn. The youth bring a great energy. I look forward to these people doing great things in life.

C. Reinisch: How is the Affordable Care Act addressing the needs of society?

J. Brenner: I see the Affordable Care Act as a first step of a 30-year journey to change a broken system. What it has done is soften people to the idea that change needs to occur. It has started conversations about care delivery. It has sent a signal that change is coming. It has served as a tipping point for strategies.

For us it has “put wind in the sails” among our local partners. It has moved our work from appearing as cute and novel to being worthwhile and in the position of creating strategy.

Accountable care organizations (ACOs) need to do more than negotiate contracts. The ACOs need to figure out how to care for sick people. Caring for the sick is
C. Reinisch: What role should health information technology play in repairing our health care system?

J. Brenner: Health information technology “right now is the engine, but it should be the caboose.” We have spent a lot of money on systems which is now impairing progress. You apply technology to a broken system, it is still broken. Poorly running systems with great technology do not improve. The money spent has served as a distraction to people. People are not focused on change. Instead, we have “vendor palooza.” There are no short cuts.

C. Reinisch: What roles do you see for advanced practice nurses (APNs) in the new system?

J. Brenner: We need half the number of physicians and four times the number of nurses. Nursing can fix the system. It has the history and philosophy needed. There are political problems with physicians. And there are cultural–social problems in nursing where they are savaging the levels.

Ninety-nine percent of what a primary care provider does should be standardized and the work passed on to APNs. Much of the work should be going to the registered nurses (RNs) as well. Nursing is weakening its structure by trying to catch up to doctors. The push to create doctor of nursing practice (DNP) programs may not be best. Destroying RN programs is a mistake.

Nursing has a beautiful ladder. I believe we need to strengthen RN and LPN programs. The future of nursing is good for improving education but not at the cost of savaging the other rungs.

C. Reinisch: What advice would you give to the new clinician?

J. Brenner: Don’t settle for working for a mediocre system. There are some bright spots to work for, so move to those areas. Find a great system to work for. Get additional training and skills in biostatistics, engineering, and business. It is not enough to lead change without additional skills.
Author Guidelines for Clinical Scholars Review

Clinical Scholars Review is a biannual, peer-reviewed publication focused on clinical excellence in the application of evidence-based practice of doctoral nursing. The mission of the Clinical Scholars Review is to support the advancement of the doctoral practice of nursing.

Articles submitted for consideration discuss clinical practice and patient care; case studies; practice issues, including management, scope of practice, and reimbursement; ethical dilemmas, legal issues, and business practices; innovative methods of teaching and evaluating advanced practice; and profiling the scholarly nature of clinical practice of nursing. As an innovative feature, students in clinical doctoral (DNP) programs will be asked to contribute original articles as well as serve as part of the review team for student submissions.

Manuscript Preparation and Review: Manuscripts must be submitted electronically as a Word document, should be double-spaced with one-inch margins, and the font set to Times New Roman (12 points). A title page separate from the main manuscript must include the title; the names of all authors (including academic degrees and primary affiliations); and the name, mailing address, e-mail address, and telephone number of the corresponding author. The manuscript itself should include a title page without author identifiers. The manuscript should conform to the Publication Manual of the American Psychological Association, 6th Edition. Digital files for any figure should conform to tiff at 300 ppi or eps. Please include written permission for previously published materials. A brief abstract should accompany the manuscript.

Authors should supply a list of four to six keywords describing the scientific content of the article that should be used for indexing in bibliographic databases.

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Systematic Review: These manuscripts critically assess clinical topics in the literature that address factors, including cause, diagnosis, prognosis, therapy, or prevention. All data sources should be searched and selected systematically for inclusion. The search, selection, and critical assessment process should be described in the manuscript. For each data source, the type of study, population, intervention, exposure, and outcomes are described. An abstract of no more than 200 words is required. Maximum length of manuscript is 3,000 words (not including abstract, tables, figures, and references), with no more than a total of four tables and/or figures and no more than 50 references.

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