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A PROFESSION TRANSFORMED

We embarked on this study aware of the sweeping social and technological changes that have altered the context and substance of nurses' work since Lysaught's 1970 national study of nursing education. As professionals with expanding responsibilities in an increasingly complex field, even seasoned expert nurses must continuously learn across domains of knowledge and skill (Benner, Tanner, & Chesla, 2009; Porter-O'Grady & Malloch, 2003, 2007). This is an ethical mandate of the profession, a fact of professional life. An introduction to general science concepts is no longer adequate for understanding—and responding to—the complex health, illness, and treatment phenomena that nurses encounter in practice.

Nurses and nurse educators alike acknowledge the enormous pressure of expanded expectations for today's nursing practice. Continuing education for nurses is now mandated for relicensure, and state boards of nursing are giving attention to improving assessment of competency for continued licensure by state boards of nursing. At this point, nurses are left to their own self-assessment and selection of continuing education from a range of continuing education classes. Although most health care organizations have become centers of teaching and learning in their own right, they focus mainly on teaching new technologies and new regulations, both of which are necessary but do not offer the clinical knowledge and skilled know-how needed for a self-improving practice. Like staff nurses, nurse educators struggle to find continued education to keep up their clinical skills and ongoing faculty development for upgrading their pedagogical and curricular skills.

A Health Care System Transformed

Increasingly, the U.S. health care system has been concerned with profits, costs, and competition; health care is viewed as a commodity and even acutely ill patients are referred to as clients, customers, or even "product lines." Hospital-based care has changed dramatically, and care for the less acutely ill has shifted to the home and community. Reimbursement strategies are shifting from volume-based to "pay-for-performance" systems, and these systems depend on nurses to ensure that hospitals meet certain measures for quality, efficiency, and patient satisfaction (Lutz & Root, 2007), thereby positioning nurses as revenue sources rather than just part of hospital cost overhead.

Since the Lysaught Report was published, employment-based health care insurance has eroded and now only partially compensates highly technical care by public insurance programs. This change causes grave inequities in U.S. health care. At this writing, according to the U.S. Census Bureau's Current Population Survey, forty-seven million people in the United States are without health insurance. As it stands now, such an unwieldy system presents few incentives for preventive care for the uninsured, though for the past ten years managed care has sought to address prevention for insured patient populations (Institute of Medicine [IOM], 2008). Medical care itself tends to focus on acute episodic care because that is what most medical education programs emphasize. Moreover, U.S. society is ethnically and linguistically diverse, which increases the challenge of communication and understanding on the part of both health care workers and patients and their families. Another challenge is an aging population, and hospital patients reflect this fact, evidenced by recent increases in Medicare's Case Mix Index for inpatients (Lutz & Root, 2007), creating strain on care demands and economic resources of hospitals.

The revolution in information technology, the mushrooming of medical and nursing literature and technologies for accessing it, and the press to adopt electronic medical records while also protecting patient privacy have also changed the landscape of nurses' work. As sharing of expertise is facilitated by technology, care is now delivered by phone, computer, and across state lines and other geographic boundaries; further development along these lines will most certainly continue. Moreover, hospitals now care primarily for highly physiologically unstable patients and those whose ongoing therapies require careful monitoring, and often immediate adjustment of medications and therapies on the basis of the patient's responses to those therapies. As Marilyn Chow, vice president of patient

care services at Kaiser Permanente, describes it, today's medical-surgical patient is the ICU patient of the 1970s (Robert Wood Johnson Foundation [RWJF], 2007). Today's nurses must work effectively in highly technical arenas within complex health care delivery systems, managing and titrating all the major medical therapies delivered in the acute care hospital, as well as in ambulatory care facilities and the home.

New Responsibilities

A tremendous shift of responsibility from physicians to nurses in all health care settings has occurred over the past sixty years. Physicians in many specialties now function primarily as diagnosticians and prescribers of treatment regimes. Nurses, patients, and family members administer these treatment regimens, usually under distant medical supervision. This requires a high degree of skill and knowledge. For example, to prepare medications nurses must understand multiple techniques of drug reconstitution, along with complex rules for drug compatibilities and incompatibilities. On the basis of the patient's response, the nurse must also adjust and titrate most therapies. Nurses are expected to perform complex, precise, and diverse technological interventions, keeping track of many machines and other devices. We noted in the staff break room of one pediatric unit that there are twenty intravenous (IV) infusion sets for children, all with distinct uses, many of which cannot be used interchangeably.

Given the nature of the interventions, the nurse's astute and early identification of changes in patients' physical condition in acute and long-term care facilities is critical to the safety and well-being of patients. The requirements of attentiveness and good clinical judgment multiply with the increasing acuity levels of hospitalized patients and with the many and diverse chronic illnesses now common in a rapidly aging population.

At the same time that this increase in the needs of hospitalized patients has come about, there has been a decline in the percentage of registered nurses (RNs) working in hospitals. The proportion of the nurse workforce employed in hospitals peaked in 1984 at 68.1 percent and has declined steadily to its current low of 56.2 percent employed registered nurses (HRSA/BHP, 2006), with more nursing care delivered in ambulatory care settings, the community, and in the home.

New Challenges

Despite these significant changes in the nature of health care work, including the need for physician nurse collaborations, health care settings remain

hierarchical (Freidson, 1970), making communication across disciplines and the design of safe health care systems more complex. However, as "doctor's orders" change from specific directions to guidelines and parameters for nurses to judiciously adjust therapies according to the patient's responses, clear communication and coordination between nursing and medicine becomes imperative. Studies have shown improved patient outcomes when the communication channels between nurses and physicians work well (Carroll, 2007; Arford, 2005; Baggs et al., 1999; Baggs, 1989), and a number of studies have demonstrated that poor nurse-physician communication is linked to medication errors (Kohn, Corrigan, & Donaldson, 2000; Leape, 1994), patient injuries (Page, 2004), and patient deaths (Tammelleo, 2001, 2002).

At cross-purposes to this new need for clear and precise communication within an interprofessional health care team is education for the various members of the team. Nursing, medicine, physical therapy, and other health care professions educate their students in academic silos, isolated from one another and hence largely ignorant of the expertise of those with whom they will need to work closely and seamlessly. Julie Gerberding, former director of the Centers for Disease Control and Prevention, has called for changing how doctors, nurses, and other health care providers are educated: "I believe that what we really need in this country are schools of health. . . . If we are seriously thinking about building a health care system, then we need to be training professionals in a collegial and collaborative manner" (Fox, 2007). However, both the Carnegie Foundation's study of medical education and this study of nursing education found that even though there is agreement that more collaborative medical and nursing education is needed, this coordination is practically absent in curriculum plans, and informal collaboration is infrequent, even in clinical settings where nurses and doctors are both in training.

New Opportunities

Over the past two decades in particular, nursing has made important academic strides through growth in programs in nursing research housed in graduate nursing schools and the availability of federal funds to support the research programs. The National Center for Nursing Research was established in 1986 by the Health Research Extension Act of 1985 (Public Law 99–158; see Kjervrik, 2006), and in 1993 the center became a full-fledged institute within the National Institutes of Health (NIH), the National Institute of Nursing Research (NINR).

These developments fostered important increases in the quantity, and quality, of research done by nurses. Exciting research is shedding new light on such issues as the psychosocial aspects of coping with illness, patient education, and physiological and behavioral aspects of health promotion and chronic illness management. There is a growing body of nursing research on symptom management, end-of-life care, care of the aged and chronically ill, genomics, and more.

The NINR research agenda continues to be directed primarily toward basic and applied research related to patient care; promotion of health and prevention of illness; reducing health disparities; understanding individual, family, and community responses to acute and chronic illness and disability; and end-of-life care. Patient care research also addresses ethical and public policy concerns that affect delivery of patient care. This research sponsorship by NIH moved nursing education and research into a new era. The impact of research-intensive nursing schools on nursing science has been extensive, and these schools led a shift in the primary focus of nursing research from nursing education to patient care. The shift was much needed, but it went too far; researchers can no longer continue to focus on one at the expense of the other. Hence one purpose of this book is to revitalize research programs in nursing education and increase efforts and resources for better faculty preparation in graduate school and ongoing faculty development and research and development of nursing education.

Integrating Nursing Science and Caring Practices

In 1970, Lysaught complained of overemphasis on the expressive, emotional, nurturing side of nursing, which at the time was usually dismissed as a feminine trait instead of being understood as facets of deep knowledge and complex skills. Lysaught worried that underemphasis of the technical and instrumental work of nurses, exemplified by such therapies as the high-impact work of starting closed-chest resuscitation, or titration of potent intravenous medications, would lead to undervaluing of the knowledge and skill required for nursing practice.

Lysaught was concerned about nurses representing themselves and being understood as having exceptional relational skills, which obscured their scientific and technical capacities. He read caregiving practices as noninstrumental "niceties" that somehow did not really count as knowledge and skill at all compared to medicine's therapeutic and curative enterprise. He offered an oversimplified choice: nurses had to represent themselves either as highly effective interventionists who were knowledgeable

and skillful in science and technology or as nonskilled nurturers—two mutually exclusive options, neither of which accurately represents the complexity of nursing care. A decade later, second-wave feminists in the 1980s sought to correct the marginalization of caring practices, arguing that caring practices and relational work, which foster growth, empowerment, and liberation, are indeed knowledge-based and complex (Benjamin, 1988; Benner & Wrubel, 1989; Ruddick, 1989; Whitbeck, 1983). This setting of instrumental, technical-scientific work in opposition to relational work is still perpetuated when nurses present their practice as primarily instrumental, or relational and nurturing work (Nelson, 2006). They ignore the fact that interpersonal relational and technical-scientific knowledge are intricately intertwined in nursing and medical instrumental work. Typically in professional fields, as the technical and instrumental nature of the knowledge and skilled know-how increase, so does the need for effective communication and relational skills.

Lysaught correctly read his current culture, but he could not predict how much technology and economics would change health care, the extent to which nurses' shift to high-stakes technical therapies also increased the need for higher levels of skill necessary to communicate with patients and families, and how crucial relational work would be for effective highly technical patient care (Benner, 1984; Benner, 2000; Benner, Tanner, & Chesla, 2009). He could not have anticipated the deep and complex education that nurses would need—the array of knowledge from the nursing sciences, natural sciences, social sciences, and humanities; skills of practice; and ethical comportment—to function as professionals. He did not confront the problem of splitting off the instrumental and the emotional skills in thinking or in any complex practice (Damasio, 1994).

This study considers the nature of nursing practice in ways that Lysaught perhaps could not recognize at the time he was writing. It joins the other Carnegie Preparation for the Professions studies to examine the deep and complex education that professionals need. All of these studies use the metaphor of "apprenticeship" to capture the experiential learning that requires interaction with a community of practice, situated coaching by teachers, and demonstration of aspects of a complex practice that are not easily translated. For example, a student cannot read about bundling premature infants as a procedure in a book and then be expected to bundle a premature infant without some professional guidance for how to avoid damaging the underdeveloped muscles of a fragile premature infant who is easily overstimulated and injured. In a professional practice, one does not easily translate what one learns from textbooks and research articles into skilled know-how and the ability to engage in clinical reasoning

across changes over time. Nor is it easy to gain a sense of salience, which is when a practitioner can discern what is more or less important in a clinical situation.

To explain how students learn during their professional education, we suggest three broad and inclusive apprenticeships that refer to the whole domain of professional knowledge and practice: (1) an apprenticeship to learn nursing knowledge and science, (2) a practical apprenticeship to learn skilled know-how and clinical reasoning, and (3) an apprenticeship of ethical comportment and formation. We use the word *apprenticeship* with some caveats. They are "high-end" apprenticeships, and by this we do not mean slavish imitation of master teachers or coaches; instead creative and critical thinking, questioning, and innovation are central to learning a professional practice. Nor do we mean on-the-job training. We also do not mean apprenticing to one master teacher or institution. High-end apprenticeships should not be confused with Bloom's taxonomy (1968), which uses teaching concepts that involve cognitive, affective, and motor pathways to teach or learn a concept or skill at the daily level of teaching specific content. Bloom points to acquiring new skills or knowledge through sight, emotion, and action pathways as a central principle of learning anything new. Indeed we agree with his integrative point about using all perceptual pathways for more effective learning. Finally we acknowledge that the term *apprenticeship learning* is particularly controversial in nursing. We thought long and hard about the advantages and disadvantages of using it. Our use of the term is not a reference to the historical apprenticeship model of learning most common in diploma schools of nursing until the early 1970s, when nursing moved into the academy. In the older model of apprenticeship of hospital training programs, students furnished the major portion of care to patients and were seen not as engaged in a program of education. In the service-driven diploma programs of forty years ago, classroom instruction and planned, tutored clinical experiences were subordinated to hospital demands for an inexpensive, and relatively unskilled, labor pool to care for patients.

Even though we want to avoid the connotations of abuse, domination, and control often associated with apprenticeship learning, we still hold on to the notion of learning by doing, observing, and participating in a community of practice. Instead, by *apprenticeship* we mean a range of integrative learning required for any professional that includes (1) instantiating, articulating, and making visible and accessible key aspects of competent and expert performance; (2) giving learners a chance for supervised practice; (3) coaching in the supervised practice to help students understand, reflect on, and articulate their practice, particularly the

nature of particular clinical situations; (4) helping novice students recognize the priorities and demands embedded in particular clinical situations so that they gain a sense of salience, that is, what must be attended to and addressed in relation to the significance and urgency in the particular clinical situation; and (5) reflection on practice to help the student develop a self-improving practice. Apprenticing oneself to a health care team, a community of practice, and even to patients and families is essential for learning to grasp the nature of the clinical situation, gaining situated understanding, skill, and the ability to *use* knowledge.

We draw heavily on Lave and Wenger (1991) in describing experiential learning, but we stop short of fully adopting their term "legitimate peripheral performance." It is almost impossible to limit learning nursing and medical practice to peripheral performance. Early in their clinical learning nursing and medical students must enter high-stakes learning situations and are called on to perform appropriately and knowledgeably in response to the immediate needs of their patients. Nurse educators deliberately engage students directly in practice as soon as possible, rather than have students just observe or shadow other nurses. Though their limited knowledge prevents central participation and agency in the beginning of their practice, they still engage in high-stakes learning situations where they must act responsibly and integrate the complex knowledge, skill, notions of good, and ethical comportment that nurses must learn to use in practice.

As the Carnegie studies have pointed out, professional schools are hybrid institutions; they are part of the tradition of "cognitive rationality" at which the academy excels, and they are part of the world of practice, where skilled know-how marks expert practitioners. Ideally, each of the three professional apprenticeships would be emphasized equally and taught integratively, as the learner changes from a layperson to professional nurse. However, the practicalities of presentation demand that we look at the three apprenticeships as distinct domains. Let us keep in mind, though, that once the three apprenticeships are separated, it is hard to get them back together again.

Acquiring and Using Knowledge and Science

Whether it is microbiology, interpretation of laboratory results, how culture and health practices intersect, or the influences of family and community on an individual's illness experience, nurses must acquire and use knowledge from many fields.

Patients in acute care, "the ICU patient of the 1970s," are extremely unstable, and nurses must be able to grasp the significance of subtle yet

meaningful changes; a keen perception of subtle changes in patients, for example, contributes to astute, possibly life-saving actions. At the same time, to act appropriately nurses now need sophisticated understanding of chemistry, physiology, pathophysiology, microbiology, physics, genetics, and more. For example, nurses need to understand physics as it is relevant to patient care. It is no longer sufficient for nurses to be concerned with oxygen exchange within the lungs; they must know how oxygen and nutrients are being taken up and used at the cellular level. Along similar lines, nurses must use knowledge from biochemistry to thoroughly understand acid-base balance, electrolytes, and solutions, biochemical cascades, coagulation, and fibrinolysis. Similarly, wherever the site of practice, nurses need a solid knowledge of microbiology, such as human-pathogen interactions and evidence-based use of antibiotics in the context of a worldwide problem of antibiotic resistance and increasing numbers of patients who are immuno-compromised.

Today's nurses are expected to know more about interpretation of laboratory findings than simply the normal and abnormal ranges. To use current intravenous drugs, which must be carefully monitored and titrated, nurses need sophisticated knowledge of pharmacokinetics, hemodynamics, and cardiac function. For practice in all areas of the acute care hospital, nurses must be prepared to administer, monitor, and evaluate these therapies.

On the horizon lie increased use of genomic medicine and pharmacodynamics. To keep pace with the care implications of research on both genetic markers and gene therapies related to multiple gene diseases, nurses will need to understand basic, medically relevant genomics. There will be an increasing need for dedicated, well-educated genetic counselors as genomics becomes more prevalent in everyday health care; nurses will need to be prepared to convey the goals and risks of genetic therapies for patients with chronic illnesses. Other areas in human genomics will also be more important for nurses, as they will be expected to educate patients about genetics related to diseases and other conditions, from birth through later life.

In short nurses need to be able to draw on new knowledge from fields traditionally taught, such as pathophysiology, and from new fields, such as genomics.

Using Clinical Reasoning and Skilled Know-How

Nurses use knowledge from many fields to help them grasp the medical and nursing implications of a situation, "read" a patient's condition over time, manage time and resources, and master ever-changing, increasingly

complex technical skills. They must also develop relational and communication skills for delivering patient care, educating patients, and being an effective health care team member. Nurses must be able to make a case to colleagues or other health professionals on behalf of a patient. Thus writing and speaking well are among the essential skills of nursing practice. Nurses need improved education in oral and written communication so that they can communicate effectively at several levels and in varied circumstances. Those in leadership positions, for example, must be particularly effective communicators, because they also create institutional directives and policy.

Nurses now perform extensive patient and family education and work with health care team members, so they must be able to articulate their practical clinical knowledge. Nurses must speak and write clearly about their narrative understanding of patient-family illness experiences and concerns. They must be able to draw out and understand "stories of illness," or patient illness narratives, as well as physical histories of injuries or disease. They must be able to make a clinical case for reporting changes in a patient's condition or concerns and in synthesizing patient and family information from many sources. The nurse's narrative understanding is also essential for the patient's experience of care; patients who feel known, whose stories inform the care they receive from nurses, experience better care than those who feel objectified and unknown.

Whether they are reading patients and a situation, talking to family members, or working with other members of the health care team, nurses need astute clinical judgment informed by attuned relational skills, such as listening, as well as reflecting and interpreting the patient's concerns and experience.

Ethical Comportment and Formation

Above all, nurses need a good grasp of everyday ethical comportment, demonstrating appropriate use of knowledge, skills of care and relations, and communication with patients and colleagues. They need to be as skilled at responding ethically to error as they are in making ethical decisions and solving problems. Nurses need the skill of ethical reflection to discern moral dilemmas and injustices created by inept or incompetent health care, by an inequitable health care delivery system, or by the competing claims of family members or other members of the health care team.

To this end, nurses must develop moral resources for nursing care and understand a range of ethical theories. Nurses cope with difficult ethical

problems that might attract attention locally or even nationally as well as issues of "everyday ethics," such as confronting substandard care. They need ethical skills and commitment to face such large-scale ethical problems as the social impact on health of violence and pollution and socioeconomic, racial, or ethnic disparities in health care and health outcomes. Nurses also have an important role at the policy level, where they must face large-scale ethical dilemmas. For these they must bring similar skills and knowledge from their unique perspective to participate in their rightful place in the health care policy arena.

Integration of Knowledge, Skilled Know-How, and Ethical Comportment

As experts in high-stakes professional practice, nurses constantly integrate their knowledge and skills according to particular patient care concerns, demands, resources, and constraints. Thus reasoning through a particular patient's condition and situation is a core skill for nurses. Because patients' conditions can change rapidly, with life and death in the balance, nurses need to be able to grasp changes in the patient's condition and integrate their knowledge and skills quickly and confidently.

Thus, as we note at the outset of this discussion, today's practitioner must continuously be able to draw on all they learn in each of the professional apprenticeships (cognitive, skilled know-how, ethical comportment) and integrate them in practice. She must hold her knowledge and skills in a fluid or semipermeable way, drawing on them as the situation requires. She must also be able to articulate what leads her to decide on a particular action. For example, a nurse expert in detecting heart arrhythmias on a unit where all patients' cardiac functioning is monitored will notice only aberrations in sound patterns, while the familiar normal sounds remain in the background of attention. She must then be able to describe what she hears to others. Whereas in many skill situations experts do not need to articulate their perspectives before taking action, the nurse must often make a clinical case for interventions to health care team members, presenting solid evidence and interpreting the clinical situation in order to get coordinated, accurate, and timely action from the team. In emergencies when no physician is available, the nurse must be able to articulate clearly the reason for using a standing order or protocol, or going beyond the usual boundaries of nursing practice to save a patient's life or prevent harm. Acting judiciously and rapidly on behalf of the patient is expected and defensible when it is critical for the patient's survival. Recognizing the unexpected, when predictable expectations of

patients' recovery are not met, is also a hallmark of expert practice (Benner et al., 2009).

At the heart of learning any practice discipline, whether it be clergy, medicine, law, engineering, or nursing, lies the need for situated cognition (Lave & Wenger, 1991), or the chance to think in particular clinical situations. Such a chance helps practitioners cope when they confront practice, where situations are ill defined and multifaceted, and each situation has many possibilities for understanding and action. The professional seeks an optimal grasp of the nature of the situation from which she can proceed in her assessments and discernment (Chan, 2005). Excellent practice requires interpretation and an imaginative grasp of the possibilities inherent in the particular situation, as well as appropriating relevant knowledge for the particular demands of the situation. For nurses, the capacities to see and to act require imaginative understanding and rapport with patients. In their formation, nurses encounter their own coping in the context of identifying others' ways of handling difficult life experiences such as suffering, dying, and emotional responses of patients, including anger, helplessness, and fear. Equally formative are students' newly developing capacities to recognize subtle signs, symptoms, and complex physiological reactions. This is why active learning and emphasis on formation are so central to professional nursing education. Student nurses need rich opportunities to continue to learn, develop their practice, and articulate it both as individual nurses and members of a health care team.

Nursing educators excel at teaching by example and with situated coaching in the clinical area, or the coaching of students in particular clinical situations. Currently students' integrative learning occurs mostly through situated coaching and from learning through the experience of practice, where students learn from other practitioners, patients, and their families. Thus we identify situated coaching as a signature pedagogy in nursing education.

Nevertheless, students experience a sharp separation of classroom and clinical teaching, and we suggest that nursing educators need to drop the current extreme divide between their teaching in classroom and clinical settings. Nursing students can, and should, develop ethical comportment in clinical and classroom settings, acquire skilled know-how and clinical reasoning in both, and build nursing knowledge in classroom and clinical settings, preferably integrated. With better integration, students learn that practice is a way of knowing in its own right. In other words, innovation and new questions flow bidirectionally, from theory and science to and from practice.

A System Inadequate to the Task

Given the enormous changes in and complexity of current nursing practice and practice settings, are nurses entering practice equipped with the knowledge and skills for today's practice and prepared to continue clinical learning for tomorrow's nursing? The answer to this question was the central goal of our study: We found that, in short, the answer is no.

Nursing practice works deliberately in the in-between social spaces of medical diagnosis and treatment and the patients' lived experience of illness or prevention of illness in their particular life, family, and community. In general, we found that nursing school curricula are weak in the natural sciences, technology, social sciences, and humanities. The curricula are weak in the experiences that enable students to work effectively with those of different cultures, races, socioeconomic status, religious affiliation, gender, or sexual preferences.

Rapid changes in science, technology, and clinical practice require a higher level of scholarship and more clinically oriented teaching in all arenas of nursing education. Like many academics, nurse educators focus on their students' acquisition of knowledge; however, nurses must know how to use that knowledge in practice (Eraut, 1994). Teaching strategies, such as situated cognition and thinking in action, are essential in classrooms, simulation laboratories, and clinical settings.

We also found that students were not well prepared to continue their clinical learning. The "pedagogies of inquiry" are weak in nursing schools. By this we mean strategies that help students learn to develop the habit and skills of following up on or working through clinical puzzles and concerns or issues that show up in clinical assignments. Pedagogies of inquiry also require learning research skills, and access to existing research databases (Malloch & O'Porter-Grady, 2006). We found serious gaps in students' knowledge about how to answer clinical questions using the literature or the resources they have at hand, such as use of information systems, databases, and asking for help from a colleague in another discipline. Thus the skills of inquiry that nurses have as they enter practice are weak, a situation which hampers their learning over the course of their careers.

Our surveys revealed that students and faculty alike think that nursing students are not adequately prepared for their first job. To be sure, schools cannot adequately prepare students for practice in all places; each practice site demands that nurses learn a significant amount of local, specific knowledge. For this, newly graduated nurses should have at least a one-year, high-quality, postgraduate residency in a specific practice

setting. Yet postgraduate residencies alone will not suffice if the student lacks a strong basis in the scientific and humanities knowledge needed for today's practice. Moreover, as noted earlier in this chapter, students need to develop excellent inquiry and research skills because they will continue to learn new knowledge and develop their practice over the course of their career. Thus schools can never adequately prepare their graduates for the full range of complexity of practice, with its ongoing changes in technology and nursing knowledge. However, they can prepare students to enter practice ready to integrate knowledge, skilled know-how, and ethical comportment and to continue to engage in self-directed learning at a highly developed level.

The current system of nursing education is not adequate to prepare today's nurses for the immediate future. We found that many teachers and students are dissatisfied with the teaching preparation of current nursing faculty. Further, we note that current graduate nursing programs do not systematically offer opportunities for learning how to teach, such as classes or seminars on teaching or guided teaching assistantships. Educators reported that they do not have enough time or opportunities to reflect or discuss the scholarship of their teaching. The combination of lack of basic teacher preparation in graduate nursing schools and limited faculty development conspires to thwart the scholarship of teaching in nursing.

In 1990 Ernest Boyer and his colleagues at the Carnegie Foundation published *Scholarship Reconsidered*, which called for a "more inclusive view of what it means to be a scholar," one that included the scholarship of teaching, along with the more accepted types of scholarship of discovery, integration, and application (Boyer, 1990). Boyer's books and the subsequent work by the Carnegie Foundation scholar Mary Huber and the vice president of the foundation Pat Hutchings touched off new interest in what it means to take up teaching as scholarship and generated important questions about teaching and learning. The International Society for the Scholarship of Teaching and Learning, created as a response to Boyer's reports, calls for institutions to make time for faculty to pursue and recognize the scholarship of teaching and learning. The scholarship of teaching and learning includes developing new approaches to curricula; new, innovative, integrative or interdisciplinary courses; new teaching and learning delivery methods such as distance education; new instructional innovations such as simulation; and evaluation strategies to capture the processes of *using knowledge*. Other approaches to teaching and learning include more integrative pedagogies, development of curricula, and restructuring of the access to practice skills and knowledge to make teaching and learning more relevant to the work within a particular discipline.

We found that multiple educational pathways for entering nursing students exacerbate the problems we identify. It is important to note that our findings about the strengths and weaknesses of nursing education are not particular to any of the various program types or settings. However, as we shall discuss, the varied pathways create limitations on student learning and disincentives for students to pursue the BSN. In general, we found that although nursing is to be lauded for being accessible through its multiple points of access to education, the system of multiple pathways into the profession, each with its own requirements for student graduation, does not support the high-quality teaching and learning so crucial to nurses' preparation and improved patient outcomes.

Multiple Pathways

Perhaps no other issue in nursing education and practice is as contested as the multiple educational pathways into the profession, the diverse range of nursing programs that prepare students to sit for the licensure exam to become a professional nurse. In nursing, the first professional degree can be an undergraduate degree, but it does not have to be. Students may sit for the National Council Licensure Examination for Registered Nurses (NCLEX-RN) upon completion of an approved generic baccalaureate program (four years), or a fast-track second baccalaureate degree program (fourteen to eighteen months), or a master's program designed for students who already have a baccalaureate degree in another discipline (three years), or an associate degree program (a program that takes at least three years and usually more to complete), or a two-to-three-year diploma program offered through freestanding schools of nursing affiliated with and sponsored by hospitals or health care systems.

Unlike medical students, who have a relatively uniform experience—an undergraduate degree, a core of prerequisites that do not vary much from school to school, and a standardized premedical admissions examination—nursing students in these various pathways do not share equivalent, or even similar, prerequisite courses. Nor have they taken a common entrance examination. Some students are recent high school graduates and others graduated from high school—or even college—decades before they started nursing school. Unlike medical students, many nursing students pursue their studies part-time or full-time.

As we considered how to convey particular findings about students' experience of nursing education, with its multiple points of entry and pathways and varied curricula and timeframes, we found it unwieldy to make comparisons based on a student's place in a program, or year

in school. Although the core nursing courses are generally designed to be completed in two years, the amount of time that elapses significantly depends on the student's program and whether she is attending full-time or part-time.

Historical Origins

Prior to 1960, nurses were educated almost exclusively in hospital-based diploma programs. In these service-driven programs, classroom instruction and planned, tutored clinical experiences—the basic components of today's nursing curriculum—were not only limited but also subordinate to the hospital's need for an inexpensive and relatively unskilled labor pool. The hospital nursing administrator directed the school and relied on students to work. Indeed, because students administered the major portion of care to patients, they were not seen so much as engaged in a program of education as supplying an extra pair of working hands.

In 1948, the year that Esther Lucille Brown published *Nursing for the Future*, there were a few schools that offered a baccalaureate in nursing. Brown argued that U.S. nursing education should occur in institutions of higher education. The first associate degree programs were created in 1958, and within twenty-five years the number of associate degree nursing programs grew from seven to nearly seven hundred (Mahaffey, 2002), coinciding with creation of the U.S. community college. Community colleges housed technical nursing programs, and most programs were publicly funded. The number of diploma schools, most of which were privately funded, declined precipitously (IOM, 1983). The Nurse Training Act of 1964 (Public Law 88–581) initiated an important stream of funding for nursing education. During the 1960s and 1970s, state and local funds increased, along with federal funds, for nurse education, teaching facilities, student loans, projects for strengthening nurse education programs, "formula payments," and training (IOM, 1983). By 1974, the number of nurses educated in a college or university equaled those educated in a diploma program.

The Rise of Community College Programs

Larger forces of economics and policy, the growth and trajectory of higher education in the United States, and the U.S. health care system all play out in nursing education. Limited funding for nursing education discourages students from entering and completing BSN programs and creates enormous pressure on community colleges (which are more affordable) to

accommodate students pursuing the ADN. Moreover, students are eager to enter practice, and the current policy for licensure not only makes it possible for them to do so but also encourages them to enter the profession with the minimum credential, which they can earn through a community college.

Indeed, they have been doing so in greater numbers. In 2006, for the first time, the majority of the 23,278 graduates from nursing schools or programs who took the NCLEX-RN were the 13,444 graduates of associate degree programs, or about 60 percent of the total number. Community colleges now produce the largest number of practicing RNs (National Council of State Boards of Nursing [NCSBN], 2005).

Yet a critical shortage of nursing faculty limits the number of students these programs can serve. Although community college programs are intended to be two-year courses of study and are presented to the public as such, with a year of prerequisites and a long waiting list for entry into programs and classes, many students need three years or more to complete the degree. For example, community college students in our national survey reported spending on average nineteen to twenty-four months in ADN programs, exclusive of the time they might spend on school or program prerequisites; in another recent study, ADNs who entered practice without the BSN reported an average of 3.69 years in an ADN program (Orsolini-Hain, 2008). In some states, programs are so constrained by shortages of instructors that students may need as many as four to six years to earn the degree; courses are simply not available. Moreover, because their funding is based on student count alone community colleges usually lack funding to fully support the high costs of the nursing students' intensely supervised clinical training.

We note that the time and expense to earn the ADN alone discourages many students from continuing their studies and completing a baccalaureate degree, especially when they can readily get a relatively well-paying position as a staff nurse. As a result, only about 21 percent of ADNs go on for further formal education (Orsolini-Hain, 2008), often missing such important areas as pediatrics, community health, and more extensive attention to leadership, as well as courses in the humanities and health policy.

Nurse educators have relied too much on general research on education and have developed little domain-specific research on teaching nursing. Approaching nursing education through the lens of domain-specific teaching would suggest that different pedagogies are needed if students are to develop a deep understanding of nursing science, relevant natural and social sciences, and humanities to be used in nursing practice. To

complement the effective clinical experience, students need to experience effective classroom pedagogies that allow them to imagine how they will respond in clinical situations. As we describe in Parts Two through Four, presenting unfolding case studies, narrative accounts of clinical experiences, or simulation of cliniclike situations would bring into the nursing school *classroom* the kinds of teaching strategies (such as coaching for situated cognition, action, and articulation) that are the signature pedagogies of clinical nursing education.

Making the classroom, skills, and simulation labs places for rich, experiential learning that encourages students to imaginatively and creatively use knowledge in particular situations offers opportunities for lasting learning that is more complex than any competency list or single theory (Taylor, 1985a). Nursing students need opportunities to safely practice reading situations, imaginatively see possibilities, and draw on knowledge in particular clinical situations.

It is extremely valuable for schools of nursing to link with the resources of schools of education, but such linkage does not solve the research problems of how best to teach for nursing practice. As guardians of the discipline and practice of nursing, nurse educators need to engage in research and development of nursing-specific pedagogies and curricular strategies (Golde & Walker, 2006).

Meeting the Demand for Nursing Education

The demand for entry into nursing school is felt throughout the system. As varied as the prerequisites for entry into a nursing program might be (which raises questions about what, exactly, the appropriate prerequisites are), we note that nursing schools are commonly oversubscribed, with a long waiting period for admission. More students are coming to nursing school (to diploma, community colleges, and BSN programs alike) with a baccalaureate or even an advanced degree from another discipline. The accelerated curricula that are designed to accommodate these students do not necessarily succeed; many students need science and social science prerequisites oriented to the nursing school curriculum.

Although a stated goal of the U.S. nursing profession (Sullivan, 2004) is diversity that more closely reflects the U.S. patient population, African American, Hispanic American, Asian American, and Native Americans make up only 9 percent of nurses, and men constitute only 6 percent of the profession. We found that nursing programs have recruitment for diversity as a goal, but the students and educators are predominantly female and Caucasian.

Raising a Bar Too Low for Entry Standards

Whether it is an indication of the continued pressures of a nursing shortage or a result of lack of appreciation for nurses' increasing responsibility, judgment, knowledge, work, and autonomy, it is puzzling to find low standards for entry to nursing school. We found wide variation in prerequisites for nursing programs, and this raises a question about what coursework students need before they start the nursing portion of their education. To compound the problem, in many regions of the country prerequisite courses for nursing school are oversubscribed and require a long waiting period for admission.

Nursing Prerequisites

There is a pressing need to expand the number of available courses and reevaluate the prerequisites for nursing education. To address variation in quality and content, a national advisory group consisting of nursing faculty, clinicians, physicians, pharmacists, and expert science teachers need to agree on content that prerequisite courses must cover before students can start a nursing program. This group would select and order the most clinically relevant science instruction for nursing and require a range of courses to give students a broad grounding in liberal arts (humanities, natural sciences, and social sciences). In addition, this group must agree on prerequisites for the many students who are coming to nursing school with a baccalaureate or advanced degree, many of whom have completed extensive coursework in natural sciences, social sciences, and humanities. We foresee that this advisory group would meet periodically to update the science course prerequisites.

Nursing also faces another significant challenge—as well as an opportunity—in the form of its multiple pathways. In the next section, we call for structural changes that would address this: requiring the BSN as the first step on a continuum of education, raising the standards for licensure.

The BSN and Beyond

Students who choose to pursue a BSN, whether through an accelerated program or a traditional one, have the advantage of learning more, and in greater depth. The general education courses that are part of the BSN curriculum expose students to further opportunities to learn to write clearly, marshal evidence for an argument, conduct research, make

connections across various domains of knowledge, articulate issues of ethics, and continue to develop knowledge and skills independently.

Thus, as we advocate in the final section of this book, among the structural changes we believe nursing education must make is to streamline community college nursing programs and create a seamless and immediate articulation with baccalaureate programs so that they can meet the heavy demand for affordable entry into the nursing education system, while not forcing students to spend three to five years on an associate degree. We also recommend that students complete their ADN and their BSN within no more than four to four and a half years. Diploma programs, community colleges, and BSN programs must develop articulation agreements that support early completion of a baccalaureate degree program in ways that are feasible, fair, and affordable for all nursing students.

Making the BSN a uniform requirement, however, is not a complete answer to improved patient care. To meet current and near-future practice demands, all nursing programs must upgrade their teaching of nursing science and knowledge; the baccalaureate degree should be but one point on a continuum of degrees and formal learning experiences that include school-to-work transition internships, such as a one-year clinical internship on completion of the first degree, and continuous, career-long learning that includes graduate education for the complex practice of nursing.

We note the promising example of the Oregon Consortium for Nursing Education, an articulated program to allow students to move seamlessly from the community college into a baccalaureate completion program—and beyond. In this new program, students may start their nursing education by earning an associate degree, then directly continue their education to earn a baccalaureate and later a master's degree. In developing the program, the members of the consortium—private and public schools of nursing that grant associate, baccalaureate, and master's degrees—began by considering the nurses Oregonians of the future will need; their design of an articulated system of preparation followed. Moreover, the members of the consortium agreed on the need for new pedagogies and introduced them through comprehensive faculty development and support. The success of the program in forging new ways of preparing nurses highlights the strong value of cooperation for the good of society that we found to be held in high esteem by nursing educators in programs all over the country, a value that could stand nursing education in good stead at this time of crisis.

Licensure

Just as the current system of pathways to nursing practice creates disincentives for entering practice with the BSN, the current standard for licensure is not an incentive for students to seek the BSN. There are no meaningful differences among the NCLEX-RN pass rates of students from the various pathways, even though the large number of test takers can create statistically significant differences. The NCLEX-RN exam uses a mastery scoring system, so test takers need complete only a sufficient number of answers to reach a minimally acceptable pass level. With this type of scoring, absolute numerical differences in total scores are not generated. In most states, students must answer at least 80 percent of the questions correctly. Some states have pegged an acceptable pass at 78 percent.

Finally, it is puzzling that although the national examination for licensure includes many multiple-choice questions on practice, nursing students are not asked to show in simulations their ability to use knowledge for the care of patients, engage in clinical reasoning, or demonstrate ethical comportment. Nursing values highly the ability of its members to practice, yet current licensure exams rely only on comprehensive nursing programs where clinical performance is evaluated. Regulatory assurance of readiness to sit for the licensure requires graduation from an accredited school of nursing where a broader range of evaluation over time occurs.

Addressing the Practice-Education Gap

Neither these structural changes nor others, however, will fully address the practice-education gap unless nursing education makes significant shifts in teaching and curricula. In the next two chapters we describe the faculty and student experience in nursing school and suggest where and how nurse education might build on its considerable strengths to deliver instruction more consistent with the complexities of nursing practice.