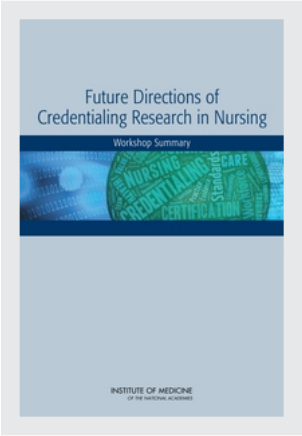

Future Directions of Credentialing Research in Nursing: Workshop Summary

DETAILS

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Future Directions of Credentialing Research in Nursing

Workshop Summary

Margaret A. McCoy and Victoria D. Weisfeld,
Rapporteurs

Board on Health Sciences Policy

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

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"Knowing is not enough; we must apply.
Willing is not enough; we must do."
—Goethe

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This workshop summary has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published summary as sound as possible and to ensure that the summary meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the process. We wish to thank the following individuals for their review of this report:

KAREN ADAMS, National Quality Forum
MARILYN P. CHOW, Kaiser Permanente
KATHLEEN GALLO, North Shore–LIJ Health System
MATTHEW D. MCHUGH, University of Pennsylvania School of Nursing

Although reviewers listed above have provided many constructive comments and suggestions, they did not see the final draft of the summary before its release. The review of this workshop summary was overseen by **MARTHA N. HILL,** Johns Hopkins University. Appointed by the Institute of Medicine, she was responsible for making certain that an independent examination of this workshop summary was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this workshop summary rests entirely with the rapporteurs and the institution.

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American Nurses Credentialing Center
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The workshop was webcast by Spark Street Digital and transcribed by Chanda Chhay.

Contents

1

Introduction[1]

The nursing workforce constitutes the largest sector of health professionals in the United States and includes individuals with varying educational backgrounds and expertise (IOM, 2011, p. xi). Like other health professions, nursing includes a large number of specialties and subspecialties. Nurses may seek certification, based on various standards and criteria, from a wide range of organizations. Similarly, organizations may participate in nursing credentialing programs, which typically reflect the attainment of various nursing care standards and outcome measures. It is, however, unclear how this additional training and education affects health care quality and patient health. As described by Hickey and colleagues (2014, p. 1), "Although it is hypothesized that credentialing leads to a higher quality of care, more uniform practice, and better patient outcomes, the research evidence to validate these views is limited."

To examine short- and long-term strategies to advance research on nurse certification and organizational credentialing,[2] the Institute of Medicine (IOM) convened the Standing Committee on Credentialing Research in Nursing, sponsored by the American Nurses Credentialing

[1]The planning committee's role was limited to planning the workshop, and the workshop summary has been prepared by the workshop rapporteurs as a factual summary of what occurred at the workshop. Statements, recommendations, and opinions expressed are those of individual presenters and participants, and are not necessarily endorsed or verified by the Institute of Medicine; they should not be construed as reflecting any group consensus.

[2]Throughout the workshop, speakers often used "credentialing" and "certification" interchangeably although "certification" and "credentialing" typically apply to an individual nurse and a health care facility (e.g., a hospital), respectively. This workshop summary uses the term "nursing credentialing" to capture both activities when discussing the field, in general, and to remain consistent with the planning committee's statement of task.

Center (ANCC). Based on the standing committee's public meetings and discussions, the ANCC asked the IOM to organize a stand-alone workshop. With guidance from a separate planning committee, the workshop was held on September 3 and 4, 2014, in Washington, DC. Twenty different organizations coalesced to sponsor the workshop *Future Directions of Credentialing Research in Nursing*, which examined a new framework and research priorities to guide future research on the impact of nursing credentialing and nurse certification on outcomes for nurses, organizations, and patients (see Box 1-1). More than 100 individuals participated in the workshop, and 3 background papers were distributed before the workshop for discussion purposes.[3]

This summary has been prepared by the workshop rapporteurs as a factual summary of what occurred at the workshop. The views contained in the report are those of individual workshop participants and do not necessarily represent the views of all participants, the planning committee, or the National Research Council/IOM. Text included under individual presentations in this summary is solely attributable to the speaker listed, unless otherwise indicated. At the end of each session, audience members were encouraged to ask questions of the panel. Questions and responses are included at the end of each chapter.

The structure of this summary generally follows the workshop agenda (see Appendix A), although some material has been rearranged to highlight workshop themes or to improve flow for readers. Appendix B provides a brief glossary of terms, based on definitions presented in workshop materials, which are commonly used throughout this report. This chapter includes background information about the workshop's conception and summarizes themes that emerged during workshop presentations and discussions. Chapter 2 provides an overview of the health care landscape in which nursing credentialing occurs and introduces an existing and proposed conceptual model to evaluate related research. Chapter 3 focuses on issues related to data harmonization, performance measurement, and health informatics. Chapter 4 covers discussions related to the assessment of core competencies in medicine and

[3]The three IOM Perspective papers presented at the workshop examined various aspects of credentialing research in nursing, including a conceptual framework to guide research; current barriers and opportunities in research design; and the role of data and the need for data harmonization to advance credentialing. The perspective papers (i.e., Hughes et al., 2014; McHugh et al., 2014; Needleman et al., 2014) are all available on the IOM website.

BOX 1-1
IOM Workshop on Future Directions in Credentialing Research in Nursing: Task and Sponsors

Statement of Task

An ad hoc committee will organize a public workshop on short- and long-term strategies to advance the field of nurse and organization credentialing research. The workshop will bring together participants with multiple perspectives in order to explore a conceptual framework and research agenda to evaluate the impacts of nurse and organization credentialing, with an emphasis on nurse and patient outcomes. The workshop will feature presentations and discussions on the following topics:

- Emergent priorities for research in nursing credentialing;
- Critical knowledge gaps and methodological limitations in the field;
- Promising developments in research methodologies, health metrics, and data infrastructures to better evaluate the impact of nursing credentialing; and
- Short- and long-term strategies to encourage continued activity in nursing credentialing research.

The committee will further develop the agenda topics, select and invite speakers and discussants, and moderate the discussions. An individually authored summary of the presentations and discussions at the workshop will be prepared by a designated rapporteur in accordance with institutional guidelines.

Sponsors

American Academy of Nurse Practitioners Certification Program; American Association of Colleges of Nursing; American Association of Critical-Care Nurses Certification Corporation; American Association of Nurse Practitioners; American Board of Nursing Specialties; American Board of Perianesthesia Nursing Certification, Inc.; American Nurses Credentialing Center; Board of Certification for Emergency Nursing; Center for Nursing Education and Testing; Competency & Credentialing Institute; Infusion Nurses Certification Corporation; Medical-Surgical Nursing Certification Board; National Board for Certification of Hospice and Palliative Nurses; National Board for Certification of School Nurses; National Board of Certification and Recertification for Nurse Anesthetists; National Certification Corporation for the Obstetric, Gynecological and Neonatal Specialties; Nephrology Nursing Certification Commission; Oncology Nursing Certification Corporation; Orthopaedic Nurses Certification Board; and Pediatric Nursing Certification Board.

nursing. Chapter 5 includes presentations about the scientific and policy implications of implementing a research framework for nursing credentialing. Chapter 6 describes some of the existing quality improvement initiatives that could benefit from, and contribute to, nursing credentialing research, as well as some of the larger factors that could influence the timeliness and relevance of nursing credentialing research. Finally, Chapter 7 summarizes reports from the following breakout sessions:

- Using the framework to develop research priorities to advance nursing credentialing.
- Improving research methodologies.
- Short- and long-term strategies to encourage activities related to nursing credentialing research.
- Stakeholder perspectives, communication, and outreach.

The workshop concluded with seven panelists providing opinions about important takeaway messages from workshop discussions, in general.

WORKSHOP THEMES

The workshop provided attendees with the opportunity to hear and to share rich experiences, diverse perspectives, and innovative ideas to advance the field of nursing credentialing research. As workshop participants considered research priorities, critical knowledge gaps and methodological limitations, emerging research methodologies and health informatics, and strategies affecting nursing credentialing research, specific ideas and activities were often repeated in both speaker presentations and in audience discussions. Box 1-2 summarizes the emerging workshop themes. These themes capture some of the overarching ideas and considerations that could inform future decisions and activities related to the development of successful research models and programs in nursing credentialing. These themes should not be interpreted as the conclusions or recommendations of the IOM, the workshop planning committee, or workshop participants as a whole.

BOX 1-2
Research in Nursing Credentialing: Emerging Workshop Themes

A Shared Research Framework. A common vision or conceptual model is needed to advance the field of nursing credentialing research by framing important research questions that respond to different stakeholder needs.

Improved Data Availability, Harmonization, and Interoperability. More standardized data, performance measures, and data collection procedures are needed to improve interoperability, which could enhance research in the field of nursing credentialing.

Examine Causality. Determining the value of nursing credentialing requires research designs and methods that can explore the causal links between evidence-based practice, nurse certification or nursing credentialing, and relevant health-related outcomes.

The Changing Roles of Nurses in a Complex Health Care Environment. The field of nursing is changing in response to increasingly complex and dynamic health care services across different health care delivery structures and care settings, which affects research strategies.

Credentialing Research and Other Health Care Improvement Initiatives. Research on nursing credentialing may contribute to, as well as benefit from, diverse health care quality improvement activities within the United States.

Additional Resources to Advance Research. Promising advances in data collection, health informatics, data infrastructures, and research designs will require additional resources.

A Shared Research Framework

A common vision or conceptual model is needed to advance the field of nursing credentialing research by framing important research questions that respond to different stakeholder needs. A number of speakers noted that current research on the impact of nurse certification and nursing credentialing is limited and inconsistent. Robin Newhouse remarked that credentialing research in nursing is at an early stage, with many aspects needing greater clarification; the system—and the profession—need a solid research base to understand the role of individual and organizational credentialing. Determining how and whether nursing credentialing affects institutional, nurse, and patient outcomes should be a primary

goal of any national agenda for credentialing research in nursing, argued Jack Needleman.

Different audiences value different purposes of credentialing and certification, stated Needleman and Nancy Dunton. The research questions are driven, in part, by how invested stakeholders define the value of credentialing, continued Matthew McHugh. The benefit to establishing a shared research framework, remarked Needleman, is that it helps to identify new research questions in the context of different audiences and outcomes. Moreover, measurement development is dependent on the selection of appropriate research questions and a theoretical framework, stated Dunton.

Improved Data Availability, Harmonization, and Interoperability

More standardized data, performance measures, and data collection procedures are needed to improve interoperability, which could enhance research in the field of nursing credentialing. Many workshop participants noted that the ability to assess the impact of nursing credentialing requires extensive data—not simply more of it, but complex data sets with granular variables to control for numerous intervening and possibly confounding variables. Throughout the workshop, speakers noted the existence of multiple credentialing and certification organizations that used different definitions of common terms, voluntary certification requirements, and data points. This leads to the idiosyncratic collection of data in nursing credentialing, which slows efforts to compare and combine data, said Ronda Hughes. She continued, this lack of data in nursing credentialing research is compounded by proprietary restrictions. The voluntary nature of nursing credentialing and insufficient data platforms pose additional barriers, noted Patricia Dykes. Dunton mentioned important limitations in the accuracy and comprehensiveness of reported data in national data sets. Moreover, meaningful measures and metrics of nurse performance are also needed, continued Dykes.

Advancement of credentialing research in nursing depends on the ability to aggregate data sets across multiple sources, which requires data harmonization and interoperability not currently available, noted many speakers. Interoperability is important if patient-centered data collection is to be achieved, argued Patricia Flatley Brennan. To answer questions about the value of nursing credentialing, systems need structured data that

are coded using a standardized terminology and that can be exchanged electronically across systems, said Murielle Beene. To help increase interoperability and encourage more robust data systems, harmonization could start with a basic, minimum set of data elements, Beene suggested. Effective use of health information technologies could also lead to a more nimble certification process, noted Brennan.

A common data model could be used to identify consistent definitions and strategies to answer specific research questions across organizations, systems, and databases, said Beene. Expanding on this idea, Dykes suggested that a common data model could facilitate discussion of important metrics (including definitions) and variables in nursing credentialing and promote standardization of data and data collection procedures, thereby increasing interoperability in credentialing research.

Examine Causality

Determining the value of nursing credentialing requires research designs and methods that can explore the causal links between evidence-based practice, nurse certification or nursing credentialing, and relevant health-related outcomes. Identifying causal pathways allows investigators to design research that explores the link between nursing credentialing and improved outcomes, said Needleman. Patrick Romano suggested that, although causality is important, it may not be necessary to establish that a credential leads to improved outcomes; it may be sufficient to demonstrate that credentialing encourages evidence-based practices, which lead to improved outcomes.

It is important to determine whether it is the process of certification or credentialing that affects health-related outcomes or whether certification or credentialing is a marker for other factors that influence health-related outcomes, argued McHugh. For example, workshop participants discussed whether current nurse certifications and nursing credentials adequately reflect, or contribute to, a certain level of clinical competency. To make this determination, clinician competencies and training outcomes should drive curricula and assessment programs, stated Eric Holmboe. Laurie Lauzon Clabo noted that the American Association of Colleges of Nursing had created a Task Force on Advanced Practice Registered Nursing to consider core competency assessment in a new clinical training approach.

The Changing Roles of Nurses in a Complex Health Care Environment

The field of nursing is changing in response to increasingly complex and dynamic health care services across different health care delivery structures and care settings, which affects research strategies. Nurses engage in intellectually, emotionally, and physically demanding work that often involves caring simultaneously for multiple patients, said Needleman. The Patient Protection and Affordable Care Act of 2010 (ACA) has created new opportunities for nurses and research to help "better understand the role that nurses are playing," said Ellen-Marie Whelan. Brennan suggested that some certification requirements may not adequately reflect the changing knowledge and skill sets required to practice in today's health care environment. Moreover, emerging technologies may fundamentally change the practice of nursing, noted Brennan.

Health care provision is increasingly team oriented, which makes it more difficult to determine which patient outcomes are attributable to which health care provider, noted Needleman. Research on the nurse's role within a care-coordination team could inform discussions of payment distributions in newer payment models, said Whelan. Many health care initiatives are targeting episodes of care for payment, said Brennan. Performance assessment methodologies must be more dynamic to respond to this changing health care environment, said Jody Frost.

Credentialing Research and Other Health Care Improvement Initiatives

Research on nursing credentialing may contribute to, as well as benefit from, diverse health care quality improvement activities within the United States. In her opening remarks, Newhouse commented on the interactive relationship between nursing credentialing research and other national health care efforts to improve quality and control costs. Linda Burnes Bolton noted that efforts to measure whether and how credentialing contributes to the overall "social good" of health promotion could help to establish the utility of credentialing research, in general. Susan Hassmiller suggested that, if research establishes that credentialing leads to improved care, such research could help to advance efforts to implement the IOM recommendations on scope-of-practice barriers in nursing and encourage more nurses to pursue doctoral degrees. Joanne Spetz

considered that credentialing may encourage more transparency, enforceability, and monitoring. Newhouse suggested that credentialing programs could be used to standardize and validate specific knowledge sets and encourage nurses to develop advanced leadership skills.

In addition to the possible contributions that it could make to other health quality improvement efforts, credentialing research may also benefit from these efforts. The ACA has expanded the sources of data available to better explain the current and future role of nurses in the U.S. health care system, expand the number of credentials, and improve credentialing research, said Whelan. Previous efforts to promote a culture of excellence and integrated health care systems could be used as a model to develop a national focus for credentialing research, said Kenneth Kizer. Robert Dittus suggested that integrating nurse certification into existing health policy initiatives to improve health outcomes, patient care, and process management could speed advancements within the field of nursing credentialing research.

However, nursing credentialing research is also somewhat subject to larger forces at play within the health care system. Kizer suggested that credentialing initiatives may make more sense when global payment schemes replace fee-for-service payments as the norm. Hassmiller advised that, if research does not affect policy or is reliant on policy change, then focused efforts on communication of existing research may be a higher priority. Kathleen Gallo noted that credentialing must appeal to the marketplace—demonstrating that credentialing will help employers, payers, and the government achieve the Triple Aim (i.e., improved patient care, improved population health, and reduced per-capita costs in health care).

Additional Resources to Advance Research

Advances in data collection, health informatics, data infrastructures, and research designs offer significant promise to the field of nursing credentialing research, remarked many workshop participants, but these opportunities require additional resources. Upgrading data environments to improve interoperability is expensive, Beene observed. Establishing both human and technological information networks across data streams and multiple stakeholders requires incentives and funding, said Dykes. Good causal research, including longitudinal studies, requires sustained funding, but the resulting evidence can attract more diverse funders, McHugh noted. He stressed the need for alternative funding strategies to

support ongoing studies and reminded the audience that the research question impacts interested funders. Needleman emphasized the need for affordable, accessible, standardized data, noting that funding for certain core activities and pilot research projects could lead to larger research programs.

The costs associated with nursing credentialing present another barrier, noted a number of workshop participants. Certification and recertification involve significant costs, which may present barriers to some hospitals, said Burnes Bolton. Employers who provide funding for initial certification may be unwilling to pay for recertification, said Kathie Kobler.

In addition to financial support, workshop participants during breakout sessions noted the potential role of independent bodies to prioritize different long- and short-term strategies. Various convening organizations could educate stakeholders about nursing credentialing and develop research questions in response to stakeholder input, said Burnes Bolton.

2

A New Framework for Credentialing Research in Nursing

Bobbie Berkowitz, chair of the planning committee, opened the workshop by welcoming all participants and thanking the workshop's sponsors. The goal of the workshop, she said, is to advance the field of nursing credentialing—as it applies to individual nurses and to organizations—by rigorous examination of its impact on important outcomes for individual nurses, patients, and health care organizations. The workshop planners envisioned a forward-looking agenda, with a focus on developing a national agenda for research, identifying critical knowledge gaps, and sparking ideas to use existing research tools and databases and develop new ones.

UNDERSTANDING THE LANDSCAPE AND STATE OF SCIENCE IN CREDENTIALING RESEARCH IN NURSING

Robin Newhouse, University of Maryland School of Nursing

This presentation provided important background information and context to help frame the workshop's goals. To lay the foundation for later discussions, Newhouse provided the International Council of Nurses' definition of credentialing:

> A term applied to processes used to designate that an individual, programme, institution or product have met established standards set by an agent (governmental or non-governmental) recognised as qualified to carry out this task. The standards may be minimal and mandatory or above the minimum and voluntary. (International Council of Nurses, 2009, p. 1)

Conversations about nursing credentialing research often focus on voluntary programs. It is also important to recognize that credentialing research, while often focused on the credential itself, can also focus on a separate but related construct—standards—which are authoritative statements defined and promoted by the profession, Newhouse said.

An individual credential may reflect the holder's desire to improve quality of practice, service, and education, and generally falls into one of three categories (Needleman et al., 2014):

1. Entry-level. Initial licensure by a state board of nursing, which affirms that basic skills are present.
2. Special skills or training. Voluntary certification within the scope of a basic professional license, such as in critical care nursing. This category may indicate a level of training well suited to improve access to, and quality of, care, particularly in special populations, said Newhouse.
3. Advanced practice. Licensure by state authorities for nurse practitioners, certified nurse midwives, clinical nurse specialists, and certified registered nurse anesthetists who also hold the appropriate specialty certification from a nurse credentialing organization.

In addition to credentialing of individuals, organizations can also seek credentialing. The American Nurses Credentialing Center's (ANCC's) Magnet Recognition Program (ANCC, 2014a) for hospitals and health systems and Pathway to Excellence program (ANCC, 2014b) for acute and long-term care settings are examples of organizational credentialing.

Current Salience of Credentialing and Credentialing Research

Credentialing is not an isolated activity within the U.S. health care system and, in fact, may be one answer to some of the nation's most pressing health care questions, said Newhouse. For example, nursing credentialing may contribute to standardized care quality and promoting nurse participation in leadership roles. The issue of credentialing research in nursing complements some of the major initiatives to improve U.S. health care today, continued Newhouse, who cited as examples the Agency for Healthcare Research and Quality's (AHRQ's) *2013 National Healthcare Quality Report* (2014) and the 2011 Institute

of Medicine (IOM) report, *The Future of Nursing: Leading Change, Advancing Health*. The AHRQ report summarizes quality metrics that the agency collects, and concludes that, overall, U.S. health care quality is suboptimal, Newhouse said, with about 70 percent of the population receiving necessary care (AHRQ, 2014).

The quality of care can vary widely from one geographic area to another and across various demographic parameters (IOM, 2013). Despite efforts to improve and standardize care under the Patient Protection and Affordable Care Act of 2010, access to care has worsened slightly, compared with previous reports, and is a challenge for approximately one in four Americans (AHRQ, 2014). Moreover, minority and low-income Americans still experience disparities in care. Nursing has the potential to ameliorate these problems, which represent both a national issue and a health care system priority.

Two specific recommendations from *The Future of Nursing* bear directly on the workshop (IOM, 2011). First, "nurses should be able to practice to the full extent of their education and training." Second, nurses should be granted opportunities to partner with physicians and other health care professionals to redesign and improve health care. Credentialing programs can be used to help implement these recommendations by standardizing and validating specific knowledge sets, skills, and competencies to improve the quality of patient care. Furthermore, nurses with advanced leadership skills can help identify problems in health care access and quality, develop related solutions, and translate research to practice for specific populations, she said.

In addition to promoting a basic level of competence, Newhouse mentioned that credentialing also protects the public, provides some degree of professional accountability, and ensures quality of practices and services. Credentialing motivates health care providers to meet established standards for care quality. By standardizing care requirements, credentialing also reduces variations in care across settings, thereby improving overall care. Finally, credentialing serves as an evaluation tool for practice competencies. Individuals and organizations seeking a credential not only meet current standards, but may also be required to continually demonstrate appropriate knowledge, skill, and competency to meet credentialing requirements.

An Initial Theoretical Model

In recent years, the ANCC Research Council synthesized existing evidence about credentialing research in nursing and convened a national summit to review the findings (Lundmark et al., 2012). In its 2012 report, the ANCC Research Council proposed a conceptual framework (the ANCC Model) that identified categories of variables affecting the impact of credentialing research (see Figure 2-1).

Newhouse commented that the ANCC Model is intended to frame broad constructs. However, many variables affect not only an individual's or an organization's decision to seek credentials but also various outcomes affecting nurses, patients, organizations, communities, and populations. Standards and credentials have a dynamic, interactive relationship with each other and intervening variables. These intervening variables (e.g., work context or factors that affect a nurse's ability to

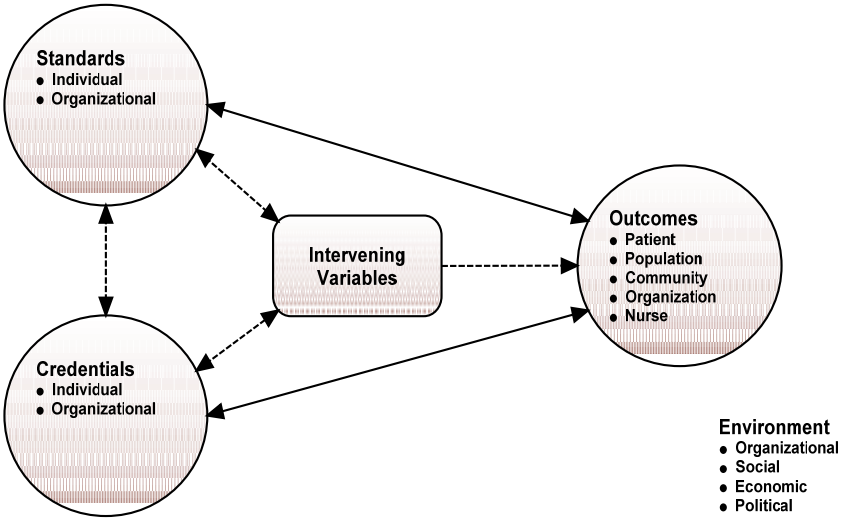

FIGURE 2-1 ANCC Research Council Model for Credentialing Research.
NOTE: This figure has been updated by Hickey and colleagues (2014).
SOURCE: Lundmark et al., 2012.

deliver patient care) have a direct link to a range of outcomes and may include factors such as work context or organizational policies or structures. In addition, powerful environmental factors (e.g., organizational, social, economic, political, and technological) also influence credentialing seeking behavior.

Although the ANCC Model is a highly simplified model, it identifies the basic relationships among large categories of factors and reflects what has been learned to this point about these complex interactions. Research that elaborates on and clarifies the interactions in this conceptual model may lead to better understanding of the link between credentialing and outcomes, especially patient outcomes.

The State of the Science

Summaries of the science evaluating the impact of individual and organization credentialing were presented at meetings of the Standing Committee on Credentialing Research, said Newhouse (Aiken, 2013; Johantgen, 2013). For individual credentialing, the evidence is somewhat scant, ranging from whether credentials can be linked to prevention of specific adverse health outcomes (e.g., falls, pressure ulcers, infections, and even mortality), procedural outcomes (e.g., medication errors), or organization-level outcomes (such as length of stay, patient satisfaction) (Newhouse, 2014). Establishing a relationship between credentialing and patient outcomes has been even more difficult, with significant practical and methodological challenges. Many of the existing studies are descriptive and correlational, and their findings are inconsistent.

Evidence from studies of organization credentialing is more informative in terms of impact. For example, most (but not all) studies of Magnet hospitals find that Magnet status is correlated with improved work environments (e.g., reduced turnover and intent to leave). The evidence linking Magnet status to patient outcomes (e.g., mortality, failure to rescue, and hospital-acquired infections) generally, but not always, indicates positive relationships.

In individual and organization credentialing research, the high prevalence of observational studies (e.g., surveys or secondary data) that are relational and not comparative is problematic. The lack of operational and conceptual clarity, use of nonstandardized definitions, and differing interpretations of variables further complicate research efforts. Even with

an ideal study, it is methodologically challenging to attribute patient outcomes to a single nurse, much less to a particular credentialing status.

In short, credentialing research in nursing is at an early stage, with many aspects needing improvement to strengthen the science. But the research is evolving, and it is important, said Newhouse. The system—and the profession—need a solid research base for both individual and organizational credentialing to bring clarity to this endeavor.

DEVELOPING A NATIONAL AGENDA FOR CREDENTIALING RESEARCH IN NURSING

Jack Needleman, University of California, Los Angeles[1]

Individual nurses and health care organizations invest in nursing credentialing because they believe it produces desirable outcomes for themselves and for the patients they treat. The justification for investing in nursing credentialing is rooted in this belief, yet the evidence remains inconclusive. As such, determining how and whether nurse credentialing affects institutional, nurse, and patient outcomes should be a primary goal of any national agenda for credentialing research in nursing, said Needleman. However, the complex nature of nursing work, the health care environment, and the credentials themselves, make demonstrating a causal relationship between credentials and outcomes difficult. Conceptual modeling of the causal pathways between credentials and outcomes offers a promising framework for addressing this challenge. In his workshop presentation, Needleman proposed such a model, compared conceptual models to other research frameworks, and discussed the relationship of research to funding as one of many key issues facing nursing credentialing researchers.

Complex Work in a Complex Environment

Nursing is intellectually, emotionally, and physically demanding work that often involves the simultaneous care of multiple patients by a single caregiver. For example, when a participating hospital in the Robert Wood Johnson Foundation's Transforming Care at the Bedside Initiative

[1]This presentation drew largely from the IOM Perspective paper *Nurse Credentialing Research Frameworks and Perspectives for Assessing a Research Agenda* (Needleman et al., 2014).

tracked nurse movement in a unit, it observed a single nurse making 23 stops during 50 minutes of a single shift (Rutherford, et al., 2008). This complexity of care places significant organizational demands on unit managers responsible for developing work assignments for staff members, which must be sensitive to how individual nurses interact with patients, one another, and other members of the care team to affect patient care.

It is important to note that the factors which individually contribute to the complexity of patient care may also interact with each other in a "non-linear fashion," said Needleman, further complicating the health care environment and increasing the challenges for researchers trying to study factors, such as credentialing, which might influence the environment. For example, patient to nurse ratios and the quality of work environments affect patient outcomes individually and in combination (Aiken et al., 2011; McHugh et al., 2013).

The growing number of credentialing organizations and types of credentials further complicates the assessment of credentialing in the health care environment. The American Board of Nursing Specialties includes 34 nursing certification member organizations, of which 26 offer 88 credentials for basic practice, 14 offer 48 credentials for advance practice nursing, and 3 offer 8 credentials for non-registered nurse (RN) practice (Needleman, 2014; Needleman et al., 2014). Similarly, the ANCC offers 28 individual certification programs across a wide range of nurse practitioner, clinical nurse specialist, and specialty certifications (Needleman, 2014). For institutions, ANCC offers several credentials, including Magnet Recognition® and Pathway to Excellence®.

Moreover, credentialed staff or institutions can influence care in many direct and indirect ways. For example, a nurse with a specific credentialed competency may be better able to treat a patient with specific needs. But patients assigned to a nurse without that credential may still receive the benefits of the competencies associated with a credential if their nurse seeks guidance from a credentialed peer. To take this into account, research on credentialing and patient outcomes may need to examine both whether a patient was treated by a credentialed nurse and whether there were credentialed nurses on the unit.

Given the number of variables and interactions, tracking the effect of a single credentialed nurse or the concentration of credentialed nurses or an institution's credential on patient outcomes constitutes a profound challenge for researchers. If a causal relationship exists between credentialing and outcomes, demonstrating it will depend on the development

of rigorous and carefully designed research studies using methods and approaches that can differentiate the effects of credentialing and other factors influencing patient care.

Potential Research Methods

Needleman posed the following question: "How do you design the research so that you have some reason to believe that the associations you are seeing are causal?" In terms of research design, the gold standard for demonstrating causality is the randomized controlled trial. However, randomized trials on credentialing are unlikely, and assessing the impact of credentials in observational studies has significant challenges. Individuals who seek voluntary credentials likely differ from their non-credentialed peers not only by credentialed status but also by personal characteristics that lead to credential-seeking behavior. In the same way, institutions that seek credentials may differ from those that do not. Needleman called this "the endogeneity problem," and noted that other methods than randomization must be used to take these factors into account to assess the impact of the credentials themselves.

Other potential research methods for demonstrating causality include natural experiments[2] and statistical adjustment. However, there are a limited number of natural experiments available, and statistical adjustments may not be able to control for all variables. Causality may also be assessed using conceptual modeling and research that focus on specific causal pathways.

A New Framework for Credentialing Research

In the ANCC model, the relationship between credentials and outcomes is mediated by a set of "intervening variables." These intervening variables, however, are not specified in detail, and the nature of the causal pathways linking credentialing and outcomes were not fully explained,

[2]Natural experiments occur when people or organizations differ in isolated and measurable ways that are outside their control. Needleman provided the example of a hypothetical case, where "some states have one set of credentialing requirements and other states have different credentialing requirements." All else being equal, investigators can "compare the experience across states," and conclude that differences in experience may be due to variability along this one parameter.

said Needleman. Therefore, research using this framework was often reductive. Often, the research on Magnet hospital status and patient and nursing outcomes regresses the outcome of interest on Magnet status and other potential confounders, but does not closely examine how the characteristics of Magnet hospitals or the Magnet journey contribute to the outcome. As a result, when conflicting research findings occur, the design of existing research cannot definitively link Magnet status to institutional performance. For example, research that compares Magnet and non-Magnet hospitals shows clear correlation between credential status and outcomes. However, research comparing Magnet hospitals to non-Magnet hospitals that are similar in size, teaching status, and other characteristics to Magnet hospitals has found weaker associations between Magnet status and outcomes of interest. Accordingly, this raises the "key question of whether it is the Magnet credential or whether it is something else about these institutions" that affects outcomes, said Needleman. Answering this question requires the development of a conceptual framework that eliminates causal ambiguities by mapping the mechanisms by which credentials and outcomes are potentially associated.

Needleman proposed an Expanded Conceptual Model (see Figure 2-2), which is a new framework that builds on the ANCC Model and attempts to map unique intervening variables to different types of outcomes in order to assess causality. Box 2-1 identifies important differences between the ANCC Model and the Expanded Conceptual Model.

The Expanded Conceptual Model includes three pathways: (1) Invisible Architecture, (2) Work Organization, and (3) Nursing Performance. Each of these pathways have three levels (from top to bottom), including competencies, a variety of intervening variables, and outcomes. Each pathway can directly or indirectly affect four types of outcomes: organization, nurse, patient, and population health outcomes.

The Invisible Architecture pathway (which includes factors such as leadership, culture, and climate of an organization) maps the associations between credentialing, the intangible characteristics of the workplace environment, and the outcomes of the organization, nurse, and patient. To illustrate this causal pathway, consider how the unique competencies of credentialed nurses may positively affect the culture and care expectations of the ward they staff in ways not mirrored by noncredentialed nurses.

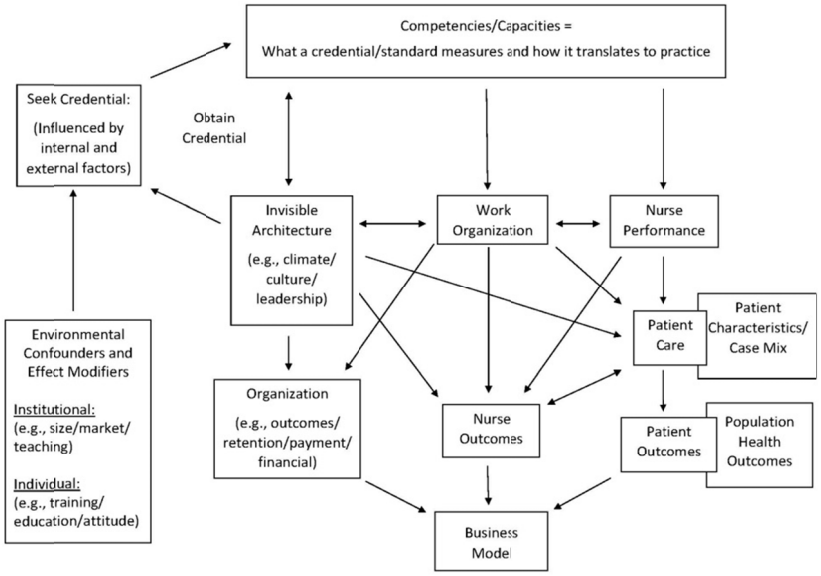

FIGURE 2-2 The Expanded Conceptual Model of potential links among credentialing, patient and organizational outcomes, and intermediate activities.
NOTE: Models for research on organizational credentialing and individual credentialing might be modified to emphasize different components of the expanded framework.
SOURCE: Needleman et al., 2014.

The Work Organization pathway focuses on how the credential-related capabilities of nurses can affect their workplace, peers, and patients not under their immediate care. For example, a credentialed nurse may advise a noncredentialed colleague regarding the care of a patient; in this way, patients not directly treated by credentialed nurses may still benefit from their competency. Further, hospital administrators may organize staff schedules to capitalize on these secondary benefits, thereby extending the effect of an individual nurse's credential to matters of work organization.

BOX 2-1
Comparison of the ANCC Model and Expanded Conceptual Model

- The credentials box in the ANCC Model was replaced with a box labeled "seek credential," and a pathway arrow labeled "obtain credential" in the Expanded Conceptual Model.
- The "standards" box in the ANCC Model is now a box labeled "Competencies/Capabilities."
- The intervening variables box in the ANCC model was expanded to include separate boxes for nurse performance, work organization, and invisible architecture (i.e., climate, culture, and leadership), as three intermediate outcomes that might be influenced directly by the credential or credentialing process.
- In the Expanded Conceptual Model, patient care was added as an intermediate outcome or process affected by the credentialing process.
- The Expanded Conceptual Model divided the ANCC Model's outcomes box into four boxes, each representating a different type of outcome: patient, population health, organization, and nurse outcomes.
- Business model considerations are added as an outcome that emerges from these outcomes.
- The environmental factors listed in the initial framework (i.e., organizational, social, economic, political) have been replaced with an "Environmental Confounders and Effects Modifiers" box that parses environmental effects into individual and institutional factors.

Finally, the Nurse Performance pathway represents the means by which an individual or organizational credential can affect the outcome of patients directly under the care of that individual nurse or organization. The Patient Care box adds a layer of complexity to this pathway by mediating the relation between the performance of credentialed nurse and the outcome of the patient. Thus, credentialed nurses leverage their special capabilities to improve their performance as nurses; in turn, this augmented performance leads by way of higher quality patient care to enhanced patient outcomes.

These three pathways are not isolated from one another. Rather, the pathways' components interact to create myriad associations and causal mechanisms. Invisible architecture affects not only organizational outcomes, but also nurse outcomes, patient care, and work organization. Nurse outcomes interact reciprocally with patient care, and are affected by each of the three intervening variables. In this way, the Expanded Conceptual Model manages to capture the interactions among outcomes

and credentials in a simple but nonreductive way. The model encourages focused and theory-driven research, without downplaying the profound complexity of nursing and the health care environment.

The Importance of Funding

The complexity of the interactions depicted in the Expanded Conceptual Model highlight the difficulty of determining whether and how credentials are causally related to outcomes. Research that seeks to map causal mechanisms between nursing credentialing and outcomes is important to the larger nursing credentialing research agenda. The credentialing process is costly and "if people are being asked to spend money to get credentials … they want to know that they are paying for something that is actually producing the outcomes that they are getting," said Needleman. The value of the Expanded Conceptual Model lies in its potential to direct and focus research, allowing it to convincingly demonstrate the means by which credentialing affects outcomes and, thereby, provide potential funders with justification for investment in nurse credentialing and related research.

Stakeholders obtain and, therefore, value credentialing for different reasons, Needleman explained. For example, nurses seeking a credential may do so because of the way it enhances "their feelings of competency, their interest in their work, [and] their sense that there is joy and pleasure in work." Organizations may acquire credentials if they believe that it reduces cost or turnover. Consumers who believe that credentials signal safe and high quality care will preference the institutions and individuals with those credentials. Table 2-1 lists the value of credentialing as perceived by different stakeholders.

These stakeholders become potential funders in credentialing research when studies are designed to target specific stakeholder values. By indicating how a unique stakeholder can benefit from credentialing, it allows scientists to tailor research objectives to the interests of consumers, care providers, and health care organizations. The singular importance of funding to credentialing research is acknowledged in the "Business Model" box at the bottom of the Expanded Conceptual Model, into which all causal pathways feed. By explicitly acknowledging the role of funding within the context of nurse credentialing research, the Expanded Conceptual Model emphasizes the importance of framing stakeholder interest and opinion within the credentialing research agenda.

Just as all the pathways in the revised framework lead to the "Business Model" box (and the financial questions it implies), each of the key issues and challenges emerge from concerns about funding, suggested Needleman. To perform high-quality research and produce convincing conclusions, more rigorous methods and larger and more robust data samples are required. Researchers will also need to consider actual demand among stakeholders for credentialing research and the most effective means of research dissemination.

Neither a conceptual framework that identifies potential causal pathways connecting credentials to outcomes, nor the stakeholder-targeted research it is designed to inform, are comprehensive solutions to the questions and challenges of nurse credentialing research. Rather, they constitute significant and necessary steps along the road to a research agenda and the potential it holds for improved outcomes for patients, nurse, and institutions alike, concluded Needleman.

TABLE 2-1 Perceived Value of Credentialing by Stakeholder

	Nurse	Delivery Organization	Oversight Organization	Credentialing Organization	Consumer
Advance safety	X	X	X	X	X
Improve quality	X	X	X	X	X
Improve processes of care	X	X	X	X	X
Clarify and define the roles and work of nurses and other team members	X	X		X	
Improve culture		X	X	X	
Provide professional support	X	X		X	
Shape future practice		X	X	X	
Improve job satisfaction	X	X		X	
Improve recruitment and retention		X		X	

SOURCE: Needleman, 2014.

QUESTIONS AND COMMENTS

Is attaining a credential more valuable (to an individual or organization) than simply having the standards and attributes associated with credentialing?

The questioner, Joanne Spetz, proposed that a credential may confer three additional benefits: transparency (i.e., greater assurance that the standards of the credentialing organization are followed), enforceability, and monitoring. She added that, if an organization's human resources program wants to move its workforce in a particular direction, then support of credentialing clearly signals that desire, and individuals obtaining the credential show they comport with institutional goals.

Needleman agreed, responding that the credentialing process potentially provides a mechanism for identifying standards and for moving people toward achieving those standards. He continued, the equally important question of whether there should be an attempt to measure the value of the credentialing journey, as well as the end state, remains unanswered.

In addition to analyzing outcomes related to an individual nurse with a particular credential, are there outcomes associated with a team of nurses or interprofessional teams (e.g., including physical therapists, nurses) of providers, all of whom are credentialed?

Needleman said the authors of the framework paper generally recognized the growing importance of teams working together for the good of the patient. However, team practice and work organization patterns can complicate credentialing research. For example, patients at high risk for falls will continue to experience a greater number of falls (though lower than they would have had otherwise) even when they are cared for by a certified "fall experts," simply because they are at an elevated risk from the outset. Therefore, a simple comparison of fall rates among patients of certified nurses with fall expertise and those without, could produce a misleading finding, as it may not capture the true impact of the certified team of experts.

Moreover, having special expertise on a unit allows the opportunity for informal or formal consultation and unit-based education that results in raising the expertise of all unit personnel, credentialed or not, said Needleman. Such knowledge sharing may decrease the observable performance differences between credentialed and noncredentialed staff members, again making it difficult to assess the true impact of credentialed providers.

As care becomes more interprofessional, should we move to credentialing teams—perhaps as a category between individual and organizational credentialing?

Needleman acknowledged that this is a vital question that deserves "substantial reflection." In inpatient and outpatient care, group- or activity-specific credentialing may be possible for some distinct units and activities. These opportunities include increasingly specialized care.

Moreover, for research on the overall team performance to be feasible, unit staff would have to be relatively stable over time, continued Needleman. In reality, team compositions vary from week to week, depending on patient and institutional staffing needs. In some cases, care is provided by ad hoc groups, making team-based analyses nearly impossible. Large electronic health records systems may, in the future, develop the capacity to match human resources information on staff credentials with that individual's respective assignments. However, current data systems do not capture this information.

Which data elements from electronic health records would be sought for this research?

Needleman suggested that, at a minimum, researchers would need to be able to identify specific credentials, including baccalaureate preparation, beyond credentials such as RN or licensed practical nurse. Furthermore, researchers would want to know which nurses are assigned to which patients, and to have enough patient-level data to understand outcomes that might be associated with credentialing. Finally, electronic records data might help build an understanding of team effects. Although obtaining these data may be somewhere down the road, Needleman advised starting to think about these information needs now.

Have you looked at the experience of other industries that require certification and credentialing, such as aviation or nuclear power?

The IOM Standing Committee on Credentialing Research in Nursing has had the benefit of public presentations regarding other industries' credentialing programs, Needleman said. Understanding how much of the experience from these settings and the nature of that work is applicable to health care remains a challenge. However, some crew resource management techniques used in aviation have been used to improve communication patterns in health care.

3

Strengthening Data and Health Informatics for Credentialing Research

DATA HARMONIZATION FOR CREDENTIALING RESEARCH

Ronda Hughes, Marquette University, and
Murielle Beene, U.S. Department of Veterans Affairs

Nursing credentialing research is limited by data sets that are "insufficiently accessible and inadequately standardized across credential types and credentialing organizations" (Hughes et al., 2014, p. 1). To better understand the impact of nurse certification or nursing credentialing on different outcomes, researchers must have access to current, standardized, and interoperable data sets (Hughes et al., 2014).[1]

Harmonizing Meaningful Data

In health care, a major challenge as a researcher or as a clinician is to generate meaning from existing data, began Hughes. Research on the impact of nursing credentialing is more than noting the presence of a dichotomous variable—whether someone has a certification or not. It requires being able to determine whether there are intervening variables that mediate, moderate, or modify the effects of having a credential. Can existing variables be used to answer research questions in a manner that is actionable and generalizable? Ideally, researchers want to determine

[1]The first two presentations drew largely from the IOM Perspective paper *The Significance of Data Harmonization for Credentialing Research* (Hughes et al., 2014).

whether meaningful differences exist between a practitioner who has a specific certification and one who is highly competent but lacks a certification, said Hughes.

Adequate data standardization is a persistent challenge. In general, data collection by numerous credentialing and certification organizations is idiosyncratic, which complicates attempts to link databases for comparison. Different organizations have their own data sets, and may select and collect variables for purposes unrelated to advancing knowledge about the value of credentialing. Even within robust databases, content and quality of content may vary significantly, with some data being more recent than other data.

Linking such varied data to outcomes is a further challenge. Observational data often lacks the granularity necessary to investigate credentialing impact, noted Hughes. For example, claims data are retrospective and cannot be used to identify which health care providers influence care to individual patients. Electronic health records (EHRs) may permit closer analysis of the care process, but Hughes again cautioned that the number of health care providers who interact with a patient during a care visit or inpatient episode make attribution of outcomes to a specific person, whether credentialed or not, next-to-impossible.

Data accessibility is another limitation, though databases may be more accessible in the future. For the most part, certification data are not easily accessed by researchers because the data are considered intellectual property of credentialing organizations and employers, explained Hughes. Even if organizations are willing to share data, financial and procedural requirements create additional barriers. In spite of these challenges, researchers are optimistic about increasing data availability.

Attaining Data System Interoperability

Beene began by stating that, as a science, informatics is at the intersection of information science, health science, and computer science and may present opportunities to develop a common data information model in nursing credentialing research. Eventually, U.S. health care data systems are meant to be interoperable, ensuring that data can be exchanged among them, but interoperability is in its early stages.

Various levels of system interoperability exist (see Table 3-1). Currently, some U.S. information systems represent Level-2 operability,

TABLE 3-1 Levels of Data Interoperability and Characteristics

Level of Interoperability and Characteristics	Examples
Level 1: Non-electronic data Exchanged manually or via "snail mail"	• Data embedded in paper forms • Handwritten notes • Paper flowsheets • Application for credential
Level 2: Unstructured data Electronically exchanged and viewable	• Scanned and PDF documents • Free text information regarding credentialing
Level 3: Structured data Electronically exchanged and viewable	• Proprietary note templates • Assessment forms in electronic health record systems that are not encoded using a standardized terminology (i.e., Logical Observation Identifiers Names and Codes) • Proprietary credentialing information (e.g., identifying variables of credentialed individual or credentialed organization)
Level 4: Structured data coded using a standardized terminology Electronically viewable and computable Can be electronically exchanged and used across systems	• Consultation notes, continuity of care documents, and discharge summaries based on a Consolidated-Clinical Document Architecture (C-CDA) template (Brull, 2012) • Code for type of credential

SOURCE: Hughes et al., 2014.

with unstructured data that are electronically exchanged and viewable, said Beene. To answer questions about what credentials and characteristics make a difference in health care provision and health outcomes, systems need structured data that are coded using a standardized terminology and can be electronically exchanged across systems.

Many barriers exist to optimizing interoperability among data systems. First, cost is the barrier upgrading these data environments. Second, the field lacks a common data model that uses consistent definitions across organizations, systems, and databases.

However, "in a service-oriented data architecture, interoperability and the exchanging of data meaningfully in their proper context can be achieved," said Beene. Cloud computing may prove helpful in data aggregation. To help increase interoperability and encourage more robust data systems, harmonization could start with a basic, minimum set of data elements, Beene suggested.

HARMONIZATION AND PERFORMANCE MEASURE DEVELOPMENT TO EVALUATE CREDENTIALING

Patricia Dykes, Brigham and Women's Hospital

According to Dykes, analytic approaches are insufficiently data-driven due to many factors related to data harmonization and meaningful performance measures, including the number of groups involved in individual and organizational credentialing; the minimum and voluntary nature of many standards; the multiple streams of (imperfect) data from different sources; the inability of current data platforms to capture, store, and organize different types of data in ways that support manipulation and analysis; and the absence of a common data model. EHRs may only perpetuate, not solve these problems, if inconsistent across systems.

To advance nursing credentialing research, Dykes suggested two research priorities: (1) establish a common credentialing data model that defines required data, how they will be used, and relationships between individual data points; and (2) identify existing measures and develop new metrics to evaluate credentialing and establish relationships between credentialing and outcomes.

A Common Data Model

A common data model could facilitate discussion of important metrics (including definitions) in nursing credentialing and promote standardization of data and data collection procedures across organizations to improve interoperability, she continued. Table 3-1 could be used as a foundation for such a data model because it identifies different categories of data that could be incorporated. Box 3-1 includes examples of some key questions that could influence the content and structure of a common data model for nursing credentialing research.

Developing a common data model will require the input of large groups of stakeholders to determine relevant data elements. Adopting a big data approach may be useful to help focus research questions and identify relevant metrics and variables based on the Expanded Conceptual Model (see Figure 2-2). Table 3-2 provides an example of leveraging that model to build a common data model that could capture the relationships among data elements, research questions and measures, and data sources in the context of organizational Magnet certification and patient falls.

BOX 3-1
Examples of Questions Affecting the Content and Structure of Common Data Models

- Which research questions are priorities for credentialing research?
- What measures already exist that might inform these questions?
- Where does this information sit in the measurement framework?
- Which data elements are needed to describe the numerator and denominator?
- What meaningful use (or other) standards currently exist that could be leveraged in order to achieve harmonization and interoperability?
- What are the current data sources?

TABLE 3-2 Example of a Credentialing Research Data Model

Research Question	Measure Description	Measure Type	Data Elements Numerator	Data Elements Denominator	Meaningful Use Standards	Data Sources
Is there an association between organizational Magnet certification and patient falls/injurious falls?	**Attainment of MU Stages 1-2 Criteria**	Structure/ Standards	Total # of hospitals that meet MU Stages 1-2 criteria	Total # of hospitals that qualify for MU Stages 1-2 criteria	MU Stage 1 MU Stage 2	CMS database
	Presence of Magnet Certification	Structure/ Certification	Total # of Magnet certified hospitals	Total # of hospitals that qualify for Magnet certification	NA	Magnet database
	Fall Risk Assessment: The hours between the most recent-fall risk assessment and the patient fall	Process	Total # of admission in which patients age 65 and older had a multifactor fall risk assessment	Total # of admissions during the reporting period, other than those covered by exclusions	Continuity of care record/ document LOINC	Medical record Administrative databases
	Patient Fall Rate: Reported as total falls per 1,000 patient days	Outcome (patient)	Total # of patient falls by hospital unit during the calendar month x 1,000	Patient days by hospital unit during calendar month	Continuity of care record/ document ICD9/10 SNOMED CT	Incident reporting system Administrative databases
	Patient Fall with Injury Rate: Reported as injury falls per 1,000 patient days	Outcome (patient)	Total # of patient falls of injury level minor or greater by hospital unit during calendar month x 1,000	Patient days by hospital unit during calendar month	Continuity of care record/ document ICD9/10 SNOMED CT	Incident reporting system Administrative databases

NOTE: CMS = Centers for Medicare & Medicaid Services; ICD = International Classification of Diseases; LOINC = Logical Observation Identifiers Names and Codes; MU = Meaningful Use; SNOMED CT = Systematized Nomenclature of Medicine–Clinical Terms.
SOURCE: Dykes, 2014.

Identifying Measures and Metrics

Identifying what data are necessary to answer vital research questions is critical. Data related to credentialing are available, but distributed across multiple organizations and databases. Although there is agreement about some necessary data points, more information is needed. For example, at the individual level, it would be useful to collect data on the education level of nurses and the accreditation status of their nursing schools. At the organizational level, it would be useful to know which Meaningful Use Stage 1 and 2 objectives have been met and to what extent the organization has adopted electronic records.

Identifying process measures to evaluate nursing credentialing is more difficult. Nurses do not consistently document their interventions. This lack of adequate data, particularly nursing process and intervention data, in a structured coded format, hinders evaluation of the impact of nursing care on patient outcomes.

Outcomes data exist in numerous places, such as in electronic health records, administrative databases, and incident reporting systems. At present, these data often are not available electronically because they are not consistently in a structured, coded format, and priorities for developing more systematic outcome data have not been set.

Given the amount of available data, it becomes important to define a process for transforming and aggregating data from various databases, said Dykes. Who will contribute, validate, and manage these data is unclear. Establishing both human and technological information networks across data streams and multiple stakeholders will require incentives and funding. These networks assist efforts to fill several large-scale data gaps, including the lack of high-quality nursing process and outcome data.

Going forward, it might be useful to identify critical nursing-sensitive and credentialing-sensitive research questions and metrics (including independent and dependent variables), develop data sources, and collect data, such as those identified in Figure 3-1. Once these data are aggregated and if a common data model exists across organizations, big data analytics can be used to generate hypotheses, which can lead to multi-site research studies.

DEVELOPING, TESTING, AND REFINING MEASURES OF NURSE-SENSITIVE QUALITY OF CARE

Nancy Dunton, Kansas University School of Nursing

Dunton focused her presentation on describing data available in the National Database of Nursing Quality Measures® (NDNQI) (which is a proprietary database that includes nurse-sensitive data on the structure, process and outcomes of care) and on how to develop valid and reliable measures.

The NDNQI Database

Dunton explained that the NDNQI includes two data streams:

1. Quarterly clinical and staffing data that include information from chart review, prevalence surveys, incident reports, patient census, payroll, and from human resources data on the education and certification of nurses.
2. A survey of nurses who spend more than 50 percent of their time in direct patient care and who have been in their current work group for at least 3 months (Dunton, 2014). The questionnaire includes a variety of questions related to education, nursing specialty certification, and credentialing.

NDNQI data uses the nursing care unit as the unit of analysis, rather than individual nurses or patients. For example, NDNQI includes measures on the prevalence of certified nurses on the unit or in a work group. NDNQI also collects data on registered nurse (RN) specialty certification through the clinical and staffing sources and the nurse survey. The NDNQI RN Survey questionnaire collects data from RNs and advanced practice registered nurses (APRNs) with current certifications in a nursing specialty that is granted by a national nursing organization.

Both NDNQI data sets can be used to identify whether a specific factor, such as certification, is associated with a nursing outcome or process about which it also collects data, although few associations have been discovered so far. The strongest association observed has been between critical care/cardiac care certifications and blood stream infections. In some instances, when certification appeared to have a significant association with a care improvement (e.g., reduced pressure ulcer rates), the cor-

relation became insignificant after controlling for education and years of practice.

There are some obvious limitations in collecting data about nursing credentialing. For example, data reporting is voluntary and many hospitals do not report all measures. Some hospitals report particular measures more frequently than do others. Dunton also explained that nurses do not always provide accurate information about certifications. NDNQI has learned to ask questions about education, credentialing, and hospital-issued certificates before asking questions about national nursing specialty certifications.

Measure Development and Evaluation

The NDNQI measure development process is designed so that evidence collected supports a submission to the National Quality Forum (NQF) for potential consensus adoption. Database developers assess the importance of the prospective measure—whether a performance gap across hospitals exists, whether the measure relates to a high volume or high cost service, and whether the measure aligns with national health care priorities. In addition, evidence is collected on the reliability and validity of measures.

Measure development is triggered by a variety of factors, including national policy issues, hospital requests, or from peer-reviewed publications on nursing processes or nurse-sensitive patient outcomes. Once a topic area is identified, the next step is to conduct literature reviews, looking for existing measures and guidelines (such as those endorsed by the NQF and the Agency for Healthcare Research and Quality [AHRQ]). If a new measure is needed, the NDNQI measure development process includes consulting with topical experts about proposed measures, developing draft guidelines and data collection forms (which include the proposed numerator and denominator, inclusion and exclusion criteria, and potential collateral data). These documents are reviewed by the experts. The next step in measure development is to conduct pilot testing in volunteer hospitals. Results from pilot testing are used to confirm data availability and data collection feasibility. The results of the pilot study can be used to refine and revise the guidelines and forms. After development, the new measure is built into NDNQI's data capture and reporting systems. Post-implementation activities involve quality assurance

checks and ongoing monitoring. New measures, in particular, are tracked for large variations over time and for problems in accessing needed data.

As an example, the process for developing NDNQI's recently released e-measure for pressure ulcer incidence and prevention took 2 years and resulted in a 60-page guidance document. Initially, nine hospitals have successfully implemented the measures, which is promising, Dunton remarked.

The final step is to conduct reliability and validity studies after a measure has been in place for at least 1 year and data collection has stabilized. For nursing-sensitive process and outcome measures, NDNQI develops multi-level models and tests to see whether nursing workforce characteristics are significantly associated with the new process or outcome measure.

Additionally, maintaining valid and reliable measures requires continual quality assurance and measure evaluation. Over time, measures are further refined or enhanced to maintain alignment with the state of the science.

INFORMATICS FOR DECISION MAKING

Patricia Flatley Brennan, University of Wisconsin–Madison

Emerging technologies are changing the rules in which health care operates, Brennan stated. Many health care quality initiatives naturally target episodes of care, driven by compensation models, in part. But achieving true patient-centered care requires expanding the focus of performance measurement or credentialing beyond the walls of a health care institution—on the episode of health rather than the episode of health care provision. Brennan then urged the nursing credentialing community to weigh patient life experiences when considering which responsibilities that individual and organizational credentialing capture. This broad perspective challenges researchers to think about data and practice differently and to consider different reference points for credentialing. "Are we credentialing an individual for life or credentialing a team for the moment?" Brennan asked.

Brennan emphasized the importance of the interoperability of information systems, if patient-centered data collection is to be achieved. The field has strategies to formalize, aggregate, and interpret data in order to assess the characteristics of an individual or organization, as well as impact of the certification. Interoperability will be essential for continuing

to assess the process of care across a number of different points, provided by practitioners whose accountabilities extend beyond a brief patient encounter. Medical informatics has taken some fledgling steps toward this, although the priority put on meeting Meaningful Use requirements has slowed the process.

Improved health information technologies may enable a more nimble certification cycle. The provision of health care services is constantly evolving, and certification programs need to account for these changes in their examinations. Brennan suggested that some certification requirements may not adequately reflect the changing knowledge and skillsets required to practice in today's health care environment. For example, telemedicine encounters or remote nurse call centers may require different knowledge management experience, critical judgment, and interpersonal skills than acute care hospital settings. Certification programs need to reflect these new realities.

Health care provision is also increasingly team oriented, and there may be opportunities for certification to measure team performance. Credentialing of teams is different from having a team whose individual members have various certifications. Team credentialing would signal whether a particular team is effective in certain care domains—care of people with chronic illnesses or of families with a seriously ill child, for example. Challenges associated with dynamic team compositions within a health care setting (e.g., changing expertise or skills required to care for patients, shift changes, and normal day-to-day exigencies) may be alleviated through different kinds of personal tracking technologies, such as radio-frequency identification sensors or programmable or wearable devices. However, adoption of technological innovation will also raise new issues.

Brennan urged the audience to consider how credentialing can reflect efforts to improve patient-centered care. Should patients have some kind of say in the credentialing process, and, if so, how should they be compensated for their participation? Should patients have input into the measurement of "outcomes," including whether they like the outcome, and is it the one they wanted? Should patient-reported outcomes be included in EHRs?

As tools for knowledge management and information access evolve, certification examinations should also evolve to reflect these changes, said Brennan. Certification programs need to consider not only how to make the best use of current technologies, but also how to incorporate technologies in the future.

QUESTIONS AND COMMENTS

As the country moves toward a health versus an illness approach and an increasing amount of care is delivered outside hospitals, how do we measure outcomes in the community?

Hughes reiterated that a formidable challenge to measuring outcomes in the community is the lack of interoperability of information systems across care settings. Even insurance data lacks information about what transpires during face-to-face encounters with clinicians. Measures need to be developed for outpatient settings that complement inpatient measures.

Brennan said attempts are under way to develop a multi-level, systems framework for health care–related data. A wider focus for collecting data on the patient experience may be needed, taking into account more of the patient's life and health and linking that information to population health. On the other hand, a narrower focus that views certification as an episodic rather than a continuous monitoring activity may be desirable for learning about professional certification. In the future, certification may be viewed not as a persistent attribute, but something verified through sampling and spot checks—an approach used in quality engineering.

Will it be necessary for human resources data systems to become more structured, or will data be captured from different streams (including from free-text portions of EHRs) and structured after the fact, in some reliable, valid way?

Dykes responded that "big data" offer the possibility of using multiple, new methods of aggregating and mining data, and of recognizing patterns, so that always having structured, coded data becomes nonessential. A good place to start would be to identify a core data set related to some of the most important research questions. The entire process is likely to be incremental. Developing partnerships with clinicians, EHR vendors, and other stakeholders will be important in designing a way forward.

At present, researchers first specify the data they want and then try to find it in their health records and data systems, Dunton added, which requires a substantial amount of judgment and testing, and can thus affect reliability. Brennan suggested there was a need to think more broadly about necessary data elements and systematic sampling strategies to be more feasible. Brennan continued, existing text-based data systems will be extremely difficult to convert to standardized terms, although that

process would be aided by development of some good natural language processing software.

How can data systems identify credentials and their value in community-based settings?

Dykes said at the organizational level, data can be collected from different sources related to individual clinicians and their credentials. However, decisions are needed to identify the data steward: the certifying organization (from which employers can pull the data) or the employer, asked Dykes. Brennan said there is not always an employer relationship at the site where a clinician is working. For example, public health nurses may work in a particular clinic, but be employed by a larger entity, such as county government. If there is an umbrella organization or a head nurse to pull information together, that may be a channel for obtaining certification information, Brennan concluded.

As more health care providers become accountable care organizations, which are required to use EHRs, will patient-level data become increasingly available?

A useful step would be to try to increase the amount of information that patients are willing to share, Hughes said, by providing incentives to report data and by minimizing concerns about privacy, confidentiality, or potential misuse of data. Brennan said many health systems offer patients Web-based portals in which they can enter personal and even clinical data (from out-of-system providers) that are not standardized, do not become part of their clinical record, and are not accessible to clinicians. This data wall needs to be broken down, she said.

Dykes reported that a current project at Brigham and Women's Hospital allows patients and families to provide feedback by entering information on their goals of care, potential concerns, and ratings of the provider team. This becomes part of their interdisciplinary plan of care. However, not every patient and family can or wants to do this.

Do certification examinations and their preparatory materials need some mechanism for continual updating, in order to improve predictive validity and achieve better alignment among health system needs, the education system, and the credentialing process?

Based on feedback received by his organization, WorkCred (an affiliate of the American National Standards Institute), participant Roy Swift stated that many health systems share the common belief that recent

graduates and credentialed professionals have a skills gap. The Quality and Safety Education for Nurses project[2] includes a range of competencies needed by future nurses that should be incorporated into education in both undergraduate and graduate training, he said.

[2]This project has defined six competencies needed by nurses, so that they have the knowledge, skills, and attitudes required for improving the quality and safety of health care systems: patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics (see Case Western Reserve University, 2014).

4

Challenges and Opportunities in Credentialing Research Methodologies

CHALLENGES AND OPPORTUNITIES IN NURSING CREDENTIALING RESEARCH DESIGN

Matthew McHugh, University of Pennsylvania School of Nursing[1]

McHugh presented some important methodological challenges in nursing credentialing and suggested possible research questions to focus discussion on how to develop solid research strategies to answer those questions. What does a credential represent and how does that, in turn, shape research design selection, asked McHugh.

In the theoretical domain, McHugh and colleagues (2014) examined how opinions about what voluntary certification actually represent might affect research design. The human capital theory suggests that, during the credentialing journey, a nurse is fundamentally changed in terms of knowledge or skills—and, by extension, competence (McHugh et al., 2014). Conversely, the signaling theory suggests that a voluntary certification is a marker for underlying traits of the person seeking the credential. Such traits may be additional years of education or experience or other characteristics when designing research. The theory selected is important because it assumes different facts, which affects potential research questions. For example, if the goal is to increase the number of credentialed individuals, the signaling theory implies that only certain classes of employee (i.e., those with the necessary underlying traits) will benefit from credentialing programs. Box 4-1 includes examples of

[1]This presentation drew largely from the IOM Perspective paper *Challenges and Opportunities in Nursing Credentialing Research Design* (McHugh et al., 2014).

BOX 4-1
Examples of Research Questions Stemming from Signaling and Human Capital Theory

Human capital-related research questions:

- Do organizational leaders invest in and promote voluntary certification because they believe that it improves quality, and what are the results?
- If certifications results in better quality, to whom do the benefits accrue?
- Who are the stakeholders in this view of credentialing?
- Who should be promoting and ultimately financing it?
- Is it a public good that could benefit a broader community?
- Signaling theory research questions:
- Are voluntary certifications a marker of quality for health care consumers?
- Do they shift any market forces so that employers are differentially hiring nurses with certifications?
- Are employers promoting certification among the nurses they already employ?

research questions stemming from each theory. Moreover, the research question affects the relevant stakeholders, which has implications for research dissemination and funding. The natural tension between those who subscribe to the signaling theory versus the human capital theory "is at the forefront of the credentialing research challenges," McHugh said.

As Needleman suggested earlier, McHugh also believes that voluntary certification reflects assumptions of both signaling and human capital theories, and the balance varies across individuals, institutions, and certification programs. Some baseline characteristics may be present, but the certification process (as either an individual or an organization) fundamentally alters an individual's knowledge and skills or organizational structure, practices, and management styles, which can lead to observed quality differences.

Research needs to focus on the intermediate pathways between the decision to credential and outcomes to determine whether an observed effect can be attributed to the credential itself or other factors within the health care context. Additional work is needed to identify intervening variables and how those intervening variables interact and for what units

of analysis (e.g., institutions, teams, or individuals) and across what settings. To date, the dominant unit of analysis in nursing credentialing research is the institution, rather than the individual nurse. But as efforts to link individual health outcomes to an individual nurse increase, more evidence at this level of analysis will be available. The expansion of the Magnet recognition program internationally will increases opportunities for comparison studies, as well as alternative care settings (e.g., hospitals, nursing homes, ambulatory care). For example, McHugh cited two recent papers which found that the nurse work environment could account for observed differences between Magnet Recognition Hospitals and non-Magnet Hospitals (McHugh et al., 2013; Stimpfel et al., 2014).

Successful research designs in nursing credentialing will not necessarily require novel research designs and methods; rather, we need to rethink how to apply existing research tools to establish causal links, said McHugh. He suggested regression analyses, propensity matching techniques, use of instrumental variables, and longitudinal research that includes counterfactual testing. As noted by other speakers, research designs will also have to account for additional challenges, such as selection bias and a lack of data and standardized data across multiple certification and credentialing programs to improve interoperability.

Finally, good causal research, including longitudinal studies, will require additional funding. In turn, this funding will generate more evidence to attract more diverse funders. Alternative funding strategies are needed that can support a program of research and ongoing studies that build on one another. For example, credentialing organizations and other stakeholders allocate a proportion of their revenues to research by independent investigators.

INVESTIGATING CAUSAL PATHWAYS AND LINKAGES

Patrick S. Romano, University of California, Davis

Romano began by exploring the question of whether causality matters in nursing credentialing research. Researchers in this field are seeking answers to a "counterfactual" question: What would the current outcomes of this nurse or nursing organization be if it were not credentialed (when, in fact, it is)? Given the difficulty of answering this counterfactual question, Romano asserted that establishing causality may not be the critical question if signaling theory can be applied. Good signals may increase the efficiency of health care markets and nursing labor

markets. In the context of organizational credentialing, Magnet status may indicate better work environments to prospective nurse employees and better health outcomes, deserving higher payments from insurers. Similarly, employers may view nurses with voluntary credentials as employees who are more motivated and committed than their counterparts, leading to better hiring opportunities and compensation.

However, there are problems with ignoring causality and relying on signaling theory to support credentialing. First, more must be known about the signal itself and what it represents. To establish whether certification and credentialing programs are valid signals of improved outcomes, each program must be assessed independently. Researchers do not currently know which characteristics of certification programs—breadth, depth, requirements, difficulty—are associated with valid signals. Second, certification programs may not be feasible in all settings or specialties for various reasons. Third, if nursing credentialing is assumed to be associated with better health outcomes via signaling, then credentialed nurses and organizations are rewarded by the market through higher income or greater market share. Credentialing then becomes a "private good" unworthy of public investment. In this situation, credentialing may be "captured" by one stakeholder group (e.g., unions) for its own benefit, and public policies to encourage credentialing may be misguided.

If researchers could identify the pathways or specific nursing practices by which credentialing leads to better outcomes, then credentialing organizations would know how to design their programs to optimize outcomes through these evidence-based pathways. It may no longer be necessary to establish that a credentialing program itself causes better outcomes. Instead, certifying bodies could design their programs to promote adherence to evidence-based processes, leading to better outcomes. Markets would then reward only the credentialing programs that are able to demonstrate these effects. Moreover, in areas where credentialing is not possible, employers could achieve (and patients could receive) better outcomes by adhering to evidence-based guidelines, regardless of the credentialing status of a health care facility or an individual practitioner. This, in turn, would "weaken the power of credentialing monopolies and reduce the risk of [skewing market signals]," said Romano. It would also clarify whether public policy should encourage individuals and organizations to pursue credentialing.

Referencing the American Nurses Credentialing Center (ANCC) Model (see Figure 2-1), Romano noted that the nonrecursive relationships imply that some "Intervening Variables" may influence credential-

seeking behavior. Similarly, improved patient outcomes may lead to changes in pathways (e.g., processes of nursing care). The Expanded Conceptual Model (see Figure 2-2) identified three categories of intervening variables (i.e., individual nurse performance, organization of nursing work tasks, and the "invisible architecture" of the nursing work environment, including organizational climate, leadership, and culture). Combinations across these categories may lead to earlier recognition of problems and appropriate interventions that produce better patient outcomes, Romano proposed. For example, failure-to-rescue research suggests that high-quality organizations and high-quality nursing care improve patient outcomes by quickly identifying patients with complications rather than by preventing complications. Nurses observe and recognize warning signs and symptoms, interpret these signs and symptoms as problems that threaten a patient's recovery, collect the additional information necessary to engage team members and facilitate decision making, quickly communicate this information to other team members, suggest specific treatments or additional tests, implement these interventions quickly and effectively, evaluate their impact in a timely and accurate manner, and finally communicate these findings back to the team. High-quality care "is very much a complex process of coordinating services, integrating care, and communicating effectively," he said.

Figure 4-1 provides a simplified conceptual model of the causal pathway leading from individual nurse credentialing to better patient outcomes. This conceptual model can be applied to any process—education, experience, credentialing—that leads to enhanced and testable knowledge and skills, leading to improvements within the three categories of intervening variables, leading in turn to earlier problem recognition, intervention, and improved patient outcomes.

A fundamental problem in analyzing causal pathways is that they are so complex, in that different knowledge and skills contribute to different behaviors, which in turn contribute to different outcomes or to several outcomes. In addition, several types of behavior can lead to a single outcome. In some cases, feedback and balancing loops come into play—for example, in the adoption of a new practice. Romano used diagrams to illustrate these causal pathways and loops, which are complex and easily oversimplified. Other methodological challenges include the fact that knowledge and attitudes may translate poorly to skills and abilities "at the front line" of care; poor documentation of most nursing activities in medical records and coded data; difficulty linking patients to individual

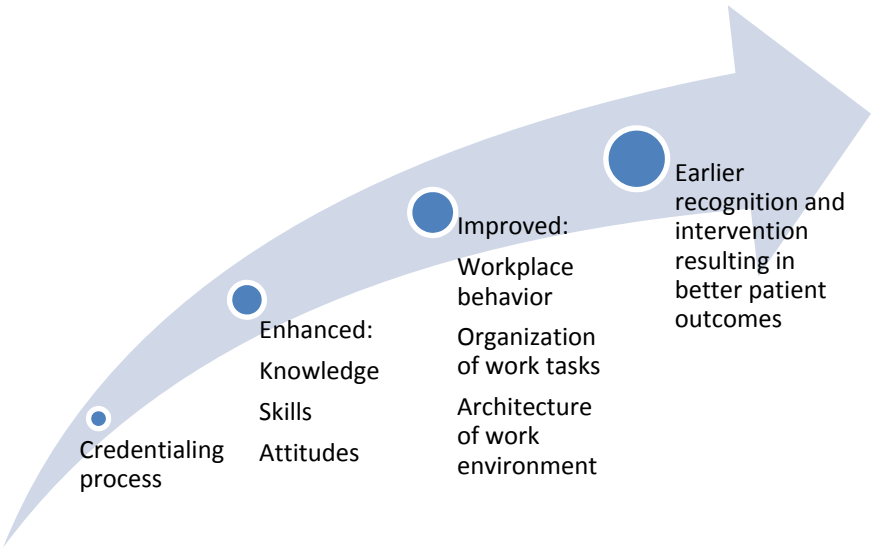

FIGURE 4-1 Simplified conceptual model of credentialing pathway.
SOURCE: Romano, 2014.

nurses for attribution of outcomes; and partitioning variance in outcomes across unit-level, nurse-level, and patient-level factors, which requires large data sets.

A combination of enhanced data collection and better analytic methods will enable more rigorous exploration of causal pathways in future research. Some of the opportunities for new or improved research methods will arise from the availability of electronic health records (EHRs), which can link patient care to individual clinicians. Audio, video, and direct observation methods are now available to permit assessment of nursing processes in real-world situations. In addition, clearer definitions of nurse-specific work processes in the International Classification of Nursing Practice now allow for more reliable coding and, therefore, analysis.[2]

Sophisticated analytic methods also are increasingly available to analyze new forms of data. Hierarchical models may allow researchers to adjust for organization, unit, nurse, and patient-level factors using data

[2]The International Classification of Nursing Practice has been adopted by the World Health Organization's Family of International Classifications and harmonized with the Systematized Nomenclature of Medicine–Clinical Terms (SNOMED CT).

sets in which all of the nurses who cared for an individual patient can be identified. Latent trait and class analysis techniques relate observed variables (e.g., credentials, experience) to underlying latent variables (e.g., quality of nursing care) without implying causality, which can be used to validate patient outcomes. Structural equation modeling incorporates latent variables and causal dependencies between exogenous and endogenous variables (e.g., path analysis), which supports estimation of both direct and indirect effects.

KNOWLEDGE DISCOVERY DATA ANALYTICS METHODS

Karen Monsen, University of Minnesota

Knowledge discovery or "Big Data" analytics is a new research paradigm that is emerging as massive data sets become available. Big Data shifts the focus of a research paradigm from scarcity, exactness, and imposition of controls to a "more, messy, good enough" approach. In this context, "more" data means less sampling error, "messy" means trying to account for inherent biases within observational data, and "good enough" means researchers no longer focus on causation but rather on learning what happens in an entire population—describing it, analyzing patterns, and generating new hypotheses.

Data infrastructures required for large data set analysis include the Nursing Minimum Data Set (NMDS) (Werley, 1991), which includes "a minimum set of elements of information with uniform definitions and categories concerning the specific dimensions of nursing, which meets the information needs of multiple data users in the health care system." The Nursing Management Minimum Data Set (NMMDS) (Huber et al., 1997) includes "core essential data needed to support the administrative and management information needs for the provision of nursing care" (Monsen, 2014). The NMMDS can look at contextual factors and the cost of providing a credentialed nurse. The American Nurses Association has recognized several nursing terminologies used in EHRs that generate NMDS variables (Sewell and Thede, 2012).

Describing some of her work, Monsen demonstrated how knowledge discovery data analytics methods can be used to identify hidden patterns in nursing data (Monsen et al., 2010). Monsen and colleagues have used inductive, deductive, visualization, and mapping approaches to create intervention groups that reveal the complexity of nursing's work and have shown how interventions relate to variability in outcomes.

She suggested that data visualization can be used to demonstrate a comprehensive, holistic nursing assessment, which depicts patient risk patterns for different problems related to knowledge, behavior, and status (Kim et al., 2013). Figure 4-2 provides examples of the types of "sunbursts," which illustrates four unique patients' risk patterns, created using public health nursing assessment data. Different colors correspond to different problems, with shading indicating degree of risk. Each problem includes three dimensions (knowledge, behavior, and status), which are represented by the three inner rings. The tabs around the outside edge mark related signs/symptoms.

Researchers have analyzed these types of clusters to identify co-occurring interventions associated with diverse problems. For example, researchers have used these types of sunbursts to explore whether public health nurses might change intervention approaches as patients' conditions improve. Similarly, data-driven clusters were useful in predicting the likelihood that frail and nonfrail elders receiving home care services would be hospitalized (Monsen et al., 2011).

In the future, inclusion of additional variables in existing data sets may allow researchers to answers questions about nursing credentialing, to explore the association between intervention patterns and patient outcomes, and to evaluate patterns across agencies and programs. Monsen suggested that inclusion of a nurse-identifier and nursing credentials in nurse-generated data sets would enable a Big Data approach to answering questions about credentialing, exploring patterns in credentialed versus noncredentialed nurse practice, and evaluating associations between credentialing and patient outcomes.

FIGURE 4-2 Sunburst images used to depict patient risk patterns.
SOURCE: Kim et al., 2013.

NEW RESEARCH OPPORTUNITIES: BUILDING ON THE MOMENTUM OF THE AFFORDABLE CARE ACT

Ellen-Marie Whelan, Centers for Medicare & Medicaid Services

The Patient Protection and Affordable Care Act of 2010 (ACA) has created new opportunities for nurses and "expanded the role that research is playing in helping us better understand the role that nurses are playing," as well as the roles nurses might play in the future, said Whelan. One goal of the ACA is to move from a producer-centered, volume-driven health care delivery system to a people-centered, outcomes-driven system. Fragmented systems of care are morphing into more coordinated systems, using a variety of new payment models in place of fee-for-service payments.

Transformation of the U.S. health care system requires three types of research:

1. Basic research using clinical efficacy studies to test what care works;
2. Outcomes, comparative effectiveness, and health services research to test who benefits from new care models; and
3. Quality measurement and improvement research to test how best to deliver care in different settings (Dougherty and Conway, 2008; Whelan, 2014).

Research about credentialing fits into the third category, as does the work of part of the Center for Medicare & Medicaid Innovation (Innovation Center), said Whelan. The Innovation Center tests new payment and service delivery and payment models to improve quality and control health care expenditures for a wide variety of patient and provider populations. Relevant research involves aligning payment incentives, health information technology, quality improvement collaboratives and learning networks, and efforts to improve training of clinicians and multidisciplinary teams.

Existing activities within the Innovation Center are generating new data sources that could be used for credentialing research, said Whelan. Two of the Centers for Medicare & Medicaid Services' (CMS's) bundled payment models, which provide a single payment for all services a patient receives during an episodes of care, involve post-acute care, in which nurses play a critical role. Nurses providing post-acute care hold

many different certifications, especially in gerontological specialties, creating an opportunity to investigate the impact of varying credentials. Similarly, CMS's Strong Start for Mothers and Newborns initiative tests the effectiveness of different prenatal care approaches in reducing preterm births for at-risk women covered by Medicaid or the Children's Health Insurance Program. All three models include variations in nurse staffing, which again may allow for comparison studies.

Newly tested models within the Innovation Center may also help target appropriate nursing services, which may lead to new credentials or modified requirements for existing credentials. In addition to promoting value-based purchasing and other programs that include incentives for adoption of EHRs and quality reporting requirements, CMS's innovation portfolio also includes programs that provide research opportunities related to nursing and nurse credentialing. Some of the Innovation Center's initial work involved accountable care organizations, which are designed to reduce costs and provide better quality care through shared savings and improved care coordination. Research on the nurse's role within a care coordination team could better clarify how savings should be distributed through the system.

Initiatives on primary care delivery are examining how to define the role of different health care providers within cost-effective, team-based care. New CMS data about the care management component of comprehensive primary care have suggested that registered nurses (RNs) and nurse practitioners provide one-third of care management services, with physicians and medical assistants providing the remaining two-thirds within participating primary care practices. If lower-cost employees can perform a particular service with equal quality outcomes, the role of those employees may change accordingly.[3] Other examples of new staff roles within the shifting health care landscape include "care coordinator," "health systems engineer," and "clinical nurse leader," the latter of which the American Association of Colleges of Nursing (AACN) is certifying.

In the future, Whelan believes quality measures will move away from narrow, setting-specific snapshots of care delivery and toward a reorientation and alignment of measures around patient-centered

[3]Whelan also briefly mentioned providing money directly to governors to encourage blended funding streams, with a specific emphasis on reducing barriers to full practice; leveraging state licensure renewal processes to identify workforce shortages and better understand the geographic distribution of providers; and asking Health Care Innovation program awardees to consider how workforce roles will change as the delivery system changes.

outcomes across settings and episodes of care. Measurement will capture information at the levels of the individual clinician, group/facility, and population/community.

QUESTIONS AND COMMENTS

If researchers could determine the link between a credential and an important outcome, would CMS scale and spread it?

Whelan replied that, from the CMS actuaries' point of view, before the "scale and spread" and implementation of regulations can occur, evidence of "success" (measured as cost savings or quality improvements) is also sought. For example, nurse practitioners and certified nurse midwives receive reimbursement for their services in some programs, and new Medicaid regulations permit states to reimburse nonlicensed clinicians for some community health work.

Jack Needleman commented that billing data are used to determine Medicare and Medicaid costs, but to assess changes in care delivery, especially when it is necessary to determine who is actually delivering the care, better data systems are needed.

Earlier presenters discussed the difference between signaling measures and human capital measures; they concluded that one of the key problems with the former measure is that signals can be weak.

Needleman stated that sometimes a weak signal exists because the differences among individuals (or organizations) who choose to obtain credentials and those who do not are not significant. Moreover, there may not be large performance differentials between credentialed and noncredentialed groups. Similarly, many noncertified individuals may have the same knowledge and skills as certified individuals, but simply choose not to pursue certification.

McHugh emphasized that it may be important to understand the differences that do exist between the two groups. For example, why do some people choose to obtain a certification and others do not? Often a population of employees is simply divided into "credentialed" and "not credentialed," and analysts make a lot of assumptions about what that means. Needleman added that credentialing data on physicians include "board eligible," as well as "board certified" categories, both of which differ from the category of physicians who did not engage in either process. He suggested an analogous approach might be useful in nursing.

Weak signals are better than no signals, and with a large enough data set, signals can often be identified, Romano added. To some extent, there may be a feedback loop, in that when the importance of a credential-related signal becomes recognized as useful or valuable, employers increase their incentives and rewards for pursuing that credential.

Could researchers use programs like NICHE (Nurses Improving Care for Healthsystem Elders)[4] as test-beds for examining credentialing effectiveness, or is it necessary to look at larger, more comprehensive service systems?

Monsen responded that, ideally, research would take both approaches, but acknowledged that funding may not be available for both. Romano said that identifying the key processes that lead to desired outcomes enables identification of the characteristics of certification programs that are most likely to affect those pathways. If research indicated that identifying high-risk patients and modifying factors to reduce this risk improves outcomes, then certification programs can target development and maintenance of the most relevant skills to reduce risk.

[4]The NICHE program, Bolton said, has a specific patient population, has data about advanced-practice nurses certified in gerontology and about staff nurses, and shows early evidence of the nurses' ability to identify patients at risk and intervene early (see NICHE, 2014).

5

Assessing Core Competencies in Nursing Credentialing

MEASURING CORE COMPETENCIES IN MEDICINE USING TRADITIONAL AND ALTERNATIVE ASSESSMENT METHODS: LESSONS FROM THE ACCREDITATION COUNCIL FOR GRADUATE MEDICAL EDUCATION (ACGME)

Eric Holmboe, ACGME

Leaders of the medical profession have realized over the past 15 years that traditional physician training models were not likely to meet a population and health care system's needs (Frenk et al., 2010), Holmboe said. Traditionally, curriculum has driven medical education objectives and clinician assessment efforts, which have remained loosely related concepts. In a competency-based education model, clinician competencies and training outcomes should flow from population and health system needs, which should also drive curricula and assessment programs, he said.

Health profession training programs, in general, are increasingly focused on the Triple Aim of improving the patient experience of care, improving the health of populations, and reducing health care's per capita cost. The professional self-regulated assessment system in physician training is evolving to reflect this new shift in focus. The assessment system includes an accreditation component for education programs and the certification and credentialing process for individuals (which tests what they have learned). Although specialty certification—a third piece of the system—is still technically voluntary, Holmboe said, an increasing number of employment settings require it.

In a competency-based medical education system, residents and fellows must also play an active role in creating and assessing their own

competence, he said. Within the training program, residents should complete a series of assessments that involve direct observation, audit of performance data, multi-source feedback (which increasingly includes patient feedback), simulation, and in-training examination. This approach creates a rich source of data that clinical competence committees analyze, as they decide whether an individual should enter unsupervised medical practice. The process provides feedback opportunities for trainees, trainers, and residence program directors, among others. The result is a physician accreditation system that now has a continuous quality improvement perspective.

"Milestones" and "entrustable professional activities" underpin the system and, together, facilitate a common language and training roadmap, which may include more than one path to competence and potentially makes the process of change easier (citing Ten Cate and Scheele, 2007). In the past, residents were rated on a nine-point scale, with ratings of 1-3 being unsatisfactory, 4-6 satisfactory, and 7-9 superior.

An example of a general "milestone" template now being used in graduate medical education programs is shown in Table 5-1. The example shows the increasing complexity of what residents are expected to be able to accomplish when taking a patient history. No subjective words, such as "satisfactory" or "unsatisfactory," are used. At level 1, "Acquires a general medical history," the milestone is rather general. At level 2, residents are expected to be able to "acquire a basic history, including medical, functional, and psychosocial elements." The milestones become increasingly complex and, by level 5, residents should be able not only to gather the appropriate information from the patient, including subtle or difficult information, but also to do so efficiently and to prioritize what they learn. Level 5 is also considered to be "aspirational," said Holmboe, meaning most residents will not achieve this level in training but rather in the first years of practice.

Monitoring milestones should enable residents, fellows, and training programs to better judge an individual's trajectory toward acquiring competency. Residents' trajectories are not necessarily linear and may advance along the continuum at different rates. By monitoring milestones, program directors (and residents) can better judge an individual's trajectory, enabling intervention and remediation. An individual resident's ratings can also be compared to the average ratings of all other trainees in a residency program.

TABLE 5-1 Accreditation Council of Graduate Medical Education (ACGME) Anatomy of a Milestone

Patient Care—History (Appropriate for Age and Impairment)				
Level 1	Level 2	Level 3	Level 4	Level 5
Milestone 1. Acquires a general medical history	Milestone 2. Acquires a basic history including medical, function, and psychosocial elements	Milestone 3. Acquires a comprehensive history integrating medical, functions, and psychosocial elements Milestone 4. Seeks and obtains data from secondary sources when needed	Milestone 5. Efficiently acquires and presents a relevant history in a prioritized and hypothesis-driven fashion across a wide spectrum of ages and impairments Milestone 6. Elicits subtleties and information that may not be readily volunteered by the patient	Milestone 7. Gathers and synthesizes information in a highly efficient manner Milestone 8. Rapidly focuses on presenting problem and elicits key information in a prioritized fashion Milestone 9. Models the gathering of subtle and difficult information from the patient

SOURCE: Holmboe, 2014.

"Entrustable professional activities" are the routine professional activities of physicians within a specialty and subspecialty, said Holmboe (citing Ten Cate and Scheele, 2007). "Entrustable" means a practitioner demonstrates the necessary knowledge, skills, and attitudes to be trusted to perform a particular activity unsupervised (but not necessarily independently). Too often, he said, people are judged competent to do their work based on "time proxies"—completing an internship or a residency, for example—when research has shown that time proxies are not necessarily reliable indicators of individual skills.

Assessment processes must be able to evaluate the most important components of the curriculum, one of which is the actual clinical care residents provide and experience during their training. Much research has shown the importance of ongoing observation and feedback from an expert clinician during training. At the same time, much effort has been put into finding the "perfect" assessment forms, which do not exist, Holmboe said. Assessment forms need to align with the purpose of the assessment and the curriculum.

Many dimensions of systems-based practices, quality care, and patient safety are not well measured through traditional assessment methods. Work-based assessments may be improved through direct observation, patient surveys, multi-source feedback, and local assessment practices to ensure continuous quality improvement at the care site. Additional criteria for assessment could include interprofessional team care, effective use of clinical decision support, and effective communication with patients, within teams, and among physician colleagues. Additionally, electronic health records may allow for embedding work-based assessments into routine clinical work, making them easier to perform and providing ongoing, longitudinal, real-time feedback.

Growing research showing that the clinical system is not providing high-quality care underscores the importance of ensuring that the educational system is better integrated with the clinical system, concluded Holmboe. ACGME is trying to define more precisely and descriptively the outcomes residency programs should be achieving, so they can design appropriate curriculum and assessment systems.

ASSESSING OUTCOME PERFORMANCE COMPETENCIES IN PHYSICAL THERAPY

Jody Frost, American Physical Therapy Association

For more than two decades, assessment has been a key issue in the physical therapy profession, began Jody Frost. The American Physical Therapy Association's (APTA's) Clinical Performance Instrument (CPI), is used to assess students during their clinical educational experiences. Physical therapy programs are not required to use the CPI, but the vast majority of programs voluntarily do.

In the 1990s, APTA developed the first version of its CPI (Roach et al., 2012), in response to the needs of practitioners for increased productivity and cost containment, proliferation of student assessments without

validity and reliability, and the risk of losing clinical education practice sites. In the first phase, planners began with a literature review and looked for trainee knowledge, skill sets, and behavioral outcomes that clinicians and academicians would endorse as essential in clinical practice. In Phase II, APTA planners hosted multiple forums in the United States and Canada to collect early input on the draft instrument. Planners also conducted pilot studies and field studies before modifying the CPI.

A decade later, APTA embarked on its second iteration of the CPI (Roach et al., 2012). in response to a number of factors (e.g., changes in curriculum requirements and transition to the Doctor of Physical Therapy (DPT) professional degree, poor standardized training in performance assessment, results of research investigations conducted on the first version of the CPI, and feedback received from users of the first CPI). Changes included

- streamlining from 24 to 18 outcomes-based performance criteria, which focus on situations that occur in every clinical setting and practice, as well as criteria which can be rated during all clinical experiences;
- changing from the more subjective visual analog scale to a rating scale with six well-defined, and statistically significant anchors;
- Removing academic jargon; and
- Providing trainees with comments and other qualitative information to provide context for individual ratings.

These modifications aimed to improve validity, reliability, acceptability, and feasibility. The initiative also attempted to avoid certain legal issues that arise from poor trainee performance by incorporating an early warning system with a defined timeline for student improvement; providing candid and objective evaluation; and facilitating dismissal when warranted.

The current instrument is similar to the approach used in medicine, Frost said; it is a multidimensional, Web-based tool, with multiple opportunities to assure consistency in ratings across clinical settings. Figure 5-1 lists the steps in the CPI assessment process. Preceptors assess their students, and students also complete self-assessments. “Red flag” items indicate significant concerns that warrant an intervention. The online system automatically generates a critical incident report if a “significant concerns” box is checked. Once checked, the preceptor, center coordinator of clinical education and academic program may need to negotiate a

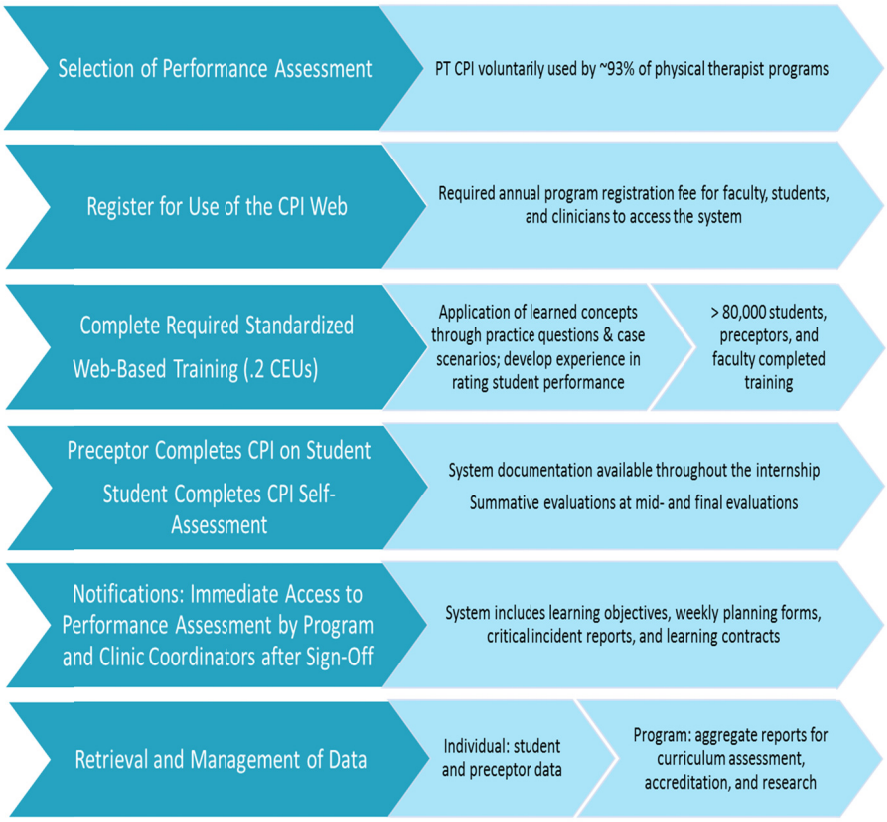

FIGURE 5-1 Steps in the CPI assessment process.
NOTE: CEU = continuing education unit; CPI = clinical performance instrument; PT = physical therapist.
SOURCE: Frost, 2014.

learning contract regarding expected student performance. If the "significant concerns" box is checked by the evaluator, a notice also automatically goes to the student, training site coordinator, and academic program coordinator for action. All users of the system complete the online, standardized training to improve reliability.

Based on her experience, Frost offered some general guidelines. Any assessment system has to be accessible, affordable, and standardized for all users. Furthermore, developing clinical performance assessment tools requires collaboration and listening, soliciting feedback, debate, balancing professional buy-in and psychometric rigor, accounting for legal considerations, standardized training, enhancing credibility by incorporating

all elements of effective assessment, minimizing academic jargon, and providing support for the transition to a Web-based tool. Moreover, the clinical assessment components must be easily updated as curriculum changes occur and patient care evolves.

Frost provided further advice specific to nursing credentialing, starting with, "You have to start the process and hope that, over time, people come on board. If you wait for everybody, you will never get it done." She suggested that nursing: (1) develop consistent, profession-based outcome competencies for nursing graduates; (2) based on these competencies, develop psychometrically sound, outcome-based assessments for students that incorporate critical components and can be used throughout clinical education; and (3) provide consistent training on how to use assessment instruments to increase their reliability.

Frost concluded by suggesting the following areas for action:

- Improve mechanisms to make outcomes performance assessments more dynamic in a changing health care environment.
- Incorporate the patient's perspective in feedback about the care trainees provide.
- Ensure assessments are sensitive to preceptors' time demands.
- Explore the potential for some common attributes of outcomes assessments to be shared across professions (e.g., safety, accountability, professionalism, and communication).
- Create a funded, centralized resource for developing assessments that can collect aggregate data across health professions.

CORE COMPETENCIES IN ADVANCED PRACTICE NURSING CREDENTIALING AND CERTIFICATION

Laurie M. Lauzon Clabo, MGH Institute of Health Professions

The American Association of Colleges of Nursing's Advanced Practice Registered Nursing Clinical Training Task Force ("the Task Force") has a project currently under way to re-envision clinical training for Advanced Practice Registered Nurses (APRNs). One of the Task Force's charges is to consider core competency assessment (across roles and patient populations) as a potential component of a new clinical training approach. Although a standardized competency-based system is desirable, the four relevant professional organizations appear to be moving along separate paths, reflecting unique competencies for which it is not known

whether common core competencies exist nor whether such competencies are different from those required for other types of nursing practice. The Task Force's current work could be used to highlight conceptual and methodological issues that may affect nursing practice as a whole.

Among the convergent forces prompting this examination are increased demands for APRN services in the health care sector, which strains training programs and increases competition for scarce clinical training sites and preceptors. The strain comes not only from the growth in numbers, but also in the complexity of practice. Preceptors say students from different programs, who supposedly are at the same point in their educational trajectory, often demonstrate very different skill levels.

To date, a coordinated, systematic approach has not been taken to identify either common competencies for all APRN roles or a standard assessment framework across APRN specialties (midwives, nurse practitioners, clinical nurse specialists, and nurse anesthetists). Moreover, there is no finite set of nationally recognized, consensus-based common core competencies for APRN assessment. For example, although some standards rely on "clinical hours" requirements, there is no evidence in the literature that these are an effective proxy for core competencies.

Gathering evidence and conducting research about core competencies involves several challenges. In the APRN field, current competency documents have limited conceptual clarity across documents, with no single common definition of competency used and variation in the scope and clarity of individual competencies, which range from long lists of psychomotor skills (completely divorced from professional judgment) to complex cognitive skills (posing serious measurement challenges). The Task Force must also determine who should participate in the identification of competencies; create a broadly understood, accessible, and efficient assessment system; and ensure that assessment goes beyond entry level and reflects the development of additional or advanced competencies through continuing professional development and practice. The Task Force also is considering whether milestones relevant to APRN core competencies can be identified, along a continuum from pre-clinical experience to graduation and beyond.

To strengthen the Task Force's efforts, research activities should focus on identifying essential competencies across multiple dimensions (educational preparation, role, population focus, and continuing professional development); developing effective and efficient assessment strategies; clarifying the relationship between competencies and patient outcomes; taking into account different units of analysis for nursing

practice in many settings; and exploring the relationship between individual and team interprofessional competence.

QUESTIONS AND COMMENTS

Should greater emphasis be placed on assessing whether providers are capable of performing competently, or is it more a question of whether providers perform consistently and reliably in every circumstance?

Holmboe said this dilemma underscores the importance of embedding performance assessment as an ongoing activity, so that competence can be demonstrated in a variety of situations. For example, in medicine, residents treat patients who appear in the clinic, yet these may not be the same kinds of patients residents will care for when in practice. Their training needs to include the opportunity to manage such patients over a reasonable time period, Holmboe concluded.

Lauzon Clabo agreed, adding that, "given the complexity of the health care system and the patient populations," assessment must be viewed not as a single, isolated event, but a process that occurs over time. Training programs cannot just hope that trainees will encounter the same type of patient in training and practice, that the preceptor will treat those patients according to current evidence, and that the preceptor will impart that knowledge effectively. Some variability in the training experience is removed by allowing multiple assessors over multiple periods of time to observe students with multiple patients.

As certification bodies update eligibility criteria, and as nurses obtain education through various modalities, can the influence that formal education has on the value of certification and on patient outcomes be determined?

Frost said some research has shown that physical therapy licensure examinations (which are more of a test of the educational process) and clinical performance instruments, actually evaluate different aspects of readiness to practice. In fact, she said, even students who do not complete their clinical education are capable of passing the licensure examination. For that reason, people should be cautious in assuming that licensure alone is an adequate indicator of provider performance. Like other panelists, she underscored the importance of context in assessments, noting that students who perform well in outpatient settings may

not do as well in inpatient situations, where patients are sicker and in a more complex and more varied situation.

Holmboe said that in medicine certification is often equated with passing an examination. While those who do not pass do not perform as well as those who do pass, this measure explains a relatively modest amount of practice variations. Certification should represent both passage of a standardized examination and clinical competence, but research has shown that the latter often receives insufficient attention.

Lauzon Clabo said the situation in nursing becomes even more layered when taking into account the multiple degree levels possible prior to entering practice. Thus, it becomes even more important to isolate these factors and reflect them in assessment models.

What is the role of ongoing, periodic performance evaluation? Does a credential cover an entire career?

Research conducted with physicians indicates that, on average, performance declines over time, especially for those in solo or small-group practices, Holmboe said. This has led to recognition that competence assessment should be ongoing, but the means for accomplishing that is undetermined—current models tend to be sporadic, narrow, and probably not very effective. Instead, ongoing self-assessment mechanisms should be embedded in practice. A good example is data registries that allow ongoing feedback to physicians and teams regarding how well they are caring for patients with specific diagnoses.

Frost added that ongoing assessment strategies have to consider that professions are changing, and individuals need to be measured against competencies relevant today, not when they graduated from their educational institution. Ideally, ongoing assessments should reflect the individual's career stage and involve both education and practice performance measures.

6

Nursing Credentialing Within a Complex Health Care Landscape

THE FUTURE OF NURSING, CREDENTIALING, AND EFFORTS TO IMPROVE QUALITY

Susan B. Hassmiller, Robert Wood Johnson Foundation

The Institute of Medicine's (IOM's) 2011 report *The Future of Nursing: Leading Change, Advancing Health* was followed by a large national campaign, mostly funded by the Robert Wood Johnson Foundation (RWJF). The campaign has generated action coalitions in every state that are working to implement the report's recommendations, most of which related to practice, education, and leadership. The activities of these coalitions inherently have implications and opportunities for credentialing research, began Hassmiller.

Nursing credentialing research could affect adoption of the IOM recommendation that Advanced Practice Registered Nurses (APRNs) should be able to practice to the full extent of their education and training. A number of states are working on initiatives related to scope of practice, which the campaign viewed as barriers to practice and care. Six states (Connecticut, Minnesota, Nevada, North Dakota, Rhode Island, and Vermont) have given APRN's full practice and prescribing authority since the Campaign for Action began, bringing the total number of states allowing full practice and prescribing authority to 19, plus the District of Columbia (AANP, 2014; Hassmiller, 2014). Four other states have made incremental improvements in that direction. If nursing credentialing signals high-quality APRN training and individual competence of advanced practice nurses, then removal of scope-of-practice barriers for credentialed individuals may be beneficial, said Hassmiller.

Evidence demonstrating that credentials involving higher education levels and lifelong learning initiatives lead to improved performance could accelerate trends by nurses to seek doctoral degrees, suggested Hassmiller. The RWJF campaign is working toward the IOM recommendations related to academic progression. Its goal is that at least 80 percent of nurses should have at least a bachelor's degree by 2020 (IOM, 2011). In addition, the RWJF campaign seeks to increase the number of nurses with doctoral degrees, implement nurse residency programs, and promote lifelong learning. Hassmiller reported that, since the IOM report was published, the number of students enrolled in the American Association of Colleges of Nursing's Registered Nursing to Bachelor of Science in Nursing (RN to BSN) programs has risen more than 50 percent, and 30 states have adopted promising models to strengthen nursing education (Hassmiller, 2014). These efforts are supported by such programs as Medicare's Graduate Nurse Education Demonstration program and by the support for BSN education within the Magnet recognition program.

A third campaign priority is to bring more nurses into leadership positions in health care, in large part, because nurses bring a unique perspective to management and policy discussions. Nurses spend the most time with patients, and they are the largest segment of the health care workforce. As such, they are vital to improving health care quality. Yet, American Hospital Association data show nurses account for only a fraction of hospital board positions. Nationally, the campaign's goal is to place 10,000 nurses on boards by 2020. Again, credentialing research might show that nurses have certain skills that translate to effective leadership.

While legitimate emphasis is put on linking credentialing to patient outcomes, that research is difficult. In some cases, said Hassmiller, "process indicators can be just as important as the end result." She pointed to the example of interprofessional collaboration. Although much still needs to be learned about interprofessional collaboration, RWJF is closing down 10 of its most significant, discipline-specific human capital leadership programs in favor of "new health-focused leadership programs that connect people across sectors as well as disciplines" (RWJF, 2014). These new programs will include interdisciplinary and team-based initiatives.

ENCOURAGING NURSING CERTIFICATION AND ASSESSMENT IN HEALTH CARE ORGANIZATIONS

Kathleen Gallo, North Shore–LIJ Health System

The North Shore–Long Island Jewish Health System (North Shore–LIJ) is a highly integrated system that offers the full continuum of care, including outpatient, inpatient, ambulatory, long-term, home, and hospice care, began Gallo. It is the largest employer and largest health system in New York State. It is also a large educational enterprise with 120 residency programs, a new medical school, and plans to develop a graduate school of nursing. Like other large health care institutions, North Shore–LIJ is undergoing a massive transformation to prepare itself for the new health care landscape. Central to its activities and to successfully managing these transitions is a high-quality workforce.

In addition to providing clinical skills training, the Center for Learning and Innovation has a "business school," which includes leadership development programs and other skills development intended to "create a pipeline of leaders in our organization," Gallo said. One program focus is on improvement sciences, in which many categories of employees are trained in Six Sigma and Lean black-belt programs, as well as microsystem improvements. Engineers are embedded in many teams to help in the redesign and transformation of clinical practices.

North Shore–LIJ is committed to many of the recommendations in *The Future of Nursing*, such as enabling APRNs to practice to the full extent of their education and training. To underscore this commitment, North Shore–LIJ offers increased pay for every specialty certification its RN staff receives. Additionally, the organization offers a year-long nurse fellowship that transitions the new nurse graduate into specialty care practice units. This program also prepares nurses for specialty certification,[1] similar to the nurse internship program recommended in *The Future of Nursing*. In addition to theoretical and clinical curriculum, the program has embedded mentoring and socialization into the work unit as a standard. In combination, all of the organizational outcomes have been positive, in terms of retention and quality measures, and one-quarter of the nurse fellows are specialty certified.

She recognized that the research on quality differentials with additional certifications is not yet definitive, but indicated that North Shore–LIJ was "fully committed to it, with or without the research. It just makes

[1]Programs are offered in critical care, emergency care, pediatrics, and pediatric hematology/oncology, perioperative services, maternity care, and others.

sense to us." Specialty expertise makes a difference because the knowledge, clinical skills, and clinical judgment acquired improve patient care and maintain clinical skills, which normally deteriorate over time. "It is a proxy for competence," she said. North Shore–LIJ is in the early development stages of creating the infrastructure for the collection and analysis of interprofessional health care workforce data.

As described by Hassmiller, *The Future of Nursing* included a recommendation that the number of nurses with baccalaureate degrees increase. For the past several years, all new North Shore–LIJ nursing hires have had their baccalaureate degrees. Any associate degree nurse working in the system has 5 to 7 years to obtain a BSN degree, and the system pays for the additional education. The system also is working to double the number of its nurses with doctoral degrees by 2020.

DEVELOPING A NATIONAL FOCUS

Kenneth W. Kizer, University of California, Davis, Health System

The need for health care to become more integrated has been increasingly recognized in recent years as a means to achieve better care and better health, Kizer explained. In order to align the focus of nurse credentialing research with these national health policy goals, research in these areas must be prioritized, he said.

He further noted that, although there is currently no standard definition for "integrated care" or "integrated delivery system," it is important to understand that the two are not equivalent. Creating integrated delivery systems will not necessarily lead to integrated care. As examples of delivery systems that were "integrated from an administrative and financial perspective," but not integrated clinically, Kizer cited the U.S. Department of Veterans Affairs (VA) health care system of the early 1990s and the military health care system. Much of the transformation of VA health care in the late 1990s was aimed at achieving clinical integration.

In general, an integrated care model has been shown to be superior to nonintegrated care in achieving higher quality and better health care value, and requires the following seven core functionalities:

1. A clearly articulated and common vision of health care service delivery;
2. Information management tools and other infrastructure to monitor, analyze, and affect clinical processes and outcomes;

3. Team-based care;
4. Methods of clinical and other accountability;
5. Strong clinical leadership;
6. Aligned interests across providers, including shared financial risks and rewards for clinical outcomes; and
7. A patient-centric and population health focus.

What credentials were necessary for nurses and other clinicians working in different parts of the health care system in order to improve quality and value, asked Kizer. With the national focus on promoting integrated care, it is more important to be able to determine how nursing credentialing either enables or contributes to the core functionalities of integrated care by answering the following research questions:

1. Does credentialing in its various forms facilitate more integrated care?
2. Does care from a credentialed individual or entity produce quantifiably superior outcomes, which the marketplace finds valuable and will reward?
3. Is nursing credentialing sufficiently standardized to allow payers (and providers) to know which types of credentialing will achieve benefits worth investing in?

To develop a national focus for credentialing research, it is also important to establish how nurse credentialing promotes a health care culture of excellence that achieves a level of superior performance that would qualify as "world class." A congressionally mandated review committee, chaired by Kizer, defined a "world class" medical facility (Kizer, 2010) as one that meets a list of criteria delineated in 18 categories that fall into the following six domains:

1. basic infrastructure;
2. leadership and culture;
3. processes of care;
4. performance;
5. knowledge management; and
6. community and social responsibility.

Kizer added that, while these structural elements were necessary to a culture of excellence, "they were not in and of themselves sufficient" as

they did not capture the "invisible architecture"—the values, the culture, the emotional climate, and other intangible aspects—of an organization that are presently impossible to measure but are essential for achieving a level of performance excellence that would quality as world class. "That invisible architecture creates the soul of the organization and catalyzes the synergies that occur between physicians and nurses and other caregivers that lead to world-class excellence," said Kizer. Thus, the final research question for nursing credentialing research is to what degree, or how, does nurse credentialing promote this catalytic interaction among providers, the facility's physical environment, and technology to achieve a culture of excellence in health care?

GETTING FROM RESULTS TO PRACTICE AND POLICY: IMPLICATIONS FOR IMPLEMENTATION

Sheila A. Haas, Loyola University of Chicago

The adoption of evidence-based practice guidelines by individual nurses and health care organizations is not easily accomplished, but can be facilitated by translation science, which investigates the "methods, interventions, and variables that influence adoption" of clinical practices, Haas began (Haas, 2014, citing Titler, 2008). Research in this field aids the "movement between patient- and population-oriented researches," leading to "improved patient outcomes and community health, and implementation of best practices," she explained (Haas, 2014, citing Rubio et al., 2010).

While care at the population level is grounded in evidence-based practice alone, care of the individual patient must also account for context-specific variables such as the patient's preferences and values and the health care team's attitudes and beliefs. If these variables are not accounted for, it will be difficult to "integrate novel, evidence-based protocols into the culture of an organization or unit," said Haas. As a result, "practice will not change" and outcomes will not improve.

To illustrate the importance of contextual variables in the adoption of new protocols, Haas provided the example of hand hygiene:

> Everybody has the knowledge as to why you wash your hands. We have the skills to wash [our] hands. Even kids in Kindergarten can do it. Yet we have 60 percent compliance in health care. Why is that? It is all about attitude.

According to Haas, the use of "theory within translational research" offers a way to identify attitudes and other contextual variables, and to develop strategies to control for them. Strategies derived from theory also help to make newly adopted practices sustainable within, and transferable among, organizations. Thus, by elucidating the manner in which research findings can be applied to care protocols, translational research renders transparent the "black box of implementation."

Yet, translational science remains an unfulfilled promise. In part, this is because many nurses have limited knowledge of the field. Translational science and evidence-based practice have only recently been added to the curricula of nurse training programs. Even Doctor of Nursing Practice students and nurse educators are inconsistently trained in translational science. The limited success of translational science is also due to the attitudes of traditional nurse researchers who, Haas claimed, see it as a "less rigorous form of research," and ignore its ability "to generate large and reliable data sets that cross entire populations." Finally, progress in translational research has been stymied by a lack of fully integrated electronic health records (EHRs) with internal architecture sufficient to support standardized coding of documents. Also lacking are leaders that recognize this problem, and informaticians who can correct it.

To surmount these obstacles, Haas recommended the following actions:

- Encourage nurse educators to learn, appreciate, teach, and facilitate translational research;
- Encourage nurse faculty to engage in translational research; and
- Transition to EHR internal architecture that supports use of standardized coding by producers and vendors of EHR software.

If these policies are enacted, Haas said that translational science will advance and health care as a whole will benefit from "sustained implementation and ongoing evaluation of best practices, as well as improvements in patient outcomes and health care safety."

QUESTIONS AND COMMENTS

What advice can the panelists offer for moving forward with a nursing credentialing research agenda?

Do not let the perfect be the enemy of the good, repeated Hassmiller. There are finite resources for research, she said, and a balance is needed between advocacy and research. If research is not affecting policy and practice, or if advancing a research agenda depends more on changing policy than on furthering research, it may become necessary to "take what [research] you have and begin to look at the communication, the messaging, and advocacy in order to make a difference."

Gallo said, "You have to appeal to the marketplace and convince big employers, payers, and government that credentialing equals quality and efficiency and will help them achieve the Triple Aim." It may also be useful to determine the credentialing "tipping point": the credentialed to noncredentialed nurse ratio at which health care teams begin to regress to the mean of credentialed practice, Gallo said.

Who should pay for the cost of credentialing: nurses, health care organizations, or the public?

At North Shore–LIJ, Gallo said, the investment in credentialing is considered a "sunk cost," and North Shore–LIJ is not waiting for 100 percent certainty regarding the value of credentialing. Kizer added that a manager would perceive credentialing policies very differently under a global payment scheme as opposed to fee-for-service. Credentialing initiatives "will make a lot more fiscal sense" when global payment schemes are the norm, he said.

Some quality initiatives, such as those promulgated by the Quality and Safety Education for Nurses (QSEN), might move the health system forward more quickly than certification can. How do you translate these initiatives into practice?

Haas said the dimensions of an initiative must be translated into a set of knowledge, skills, and attitudes. These competencies should be integrated into nurse training and graduate coursework. Gallo added that quality and safety training initiatives are not confined to QSEN or to nursing, and that the entire clinical team should learn quality improvement skills.

ANA recognizes 14 structured data sets, whereas the Systematized Nomenclature of Medicine–Clinical Terms (SNOMED CT) recognizes substantially fewer. If health care organizations are expected to code data, how will that happen uniformly and comprehensively with so many data set options?

Workshop participants disagreed about the extent to which SNOMED can map back to all of the nursing terminology data sets currently maintained and shared the concern that keeping the data mapping current may be an ongoing challenge for the multiple organizations that developed these various coding schemes. In addition, SNOMED staff has said that only public domain coding structures (not proprietary ones) will be included in SNOMED, said Roy Simpson.

What kinds of incentives are needed in order for nurses to voluntarily seek credentialing?

Even when nurses have the opportunity to become certified at their employers' expense, not all choose to do so, said workshop participant Roy Simpson. Haas replied that organizations can increase participation in credentialing programs by setting the expectation that employees will obtain the credentials for which they possess the requisite competencies. This expectation should receive greater emphasis in nursing schools, suggested workshop participant Linda Lakdawala.

Linda Burnes Bolton said, "There are real costs to initial certification and keeping it up." The "wealthier" academic medical centers cannot be the only ones to adopt a mandatory certification policy; certification must be affordable for all hospitals, she said. Even employers who will pay for initial certification may be unwilling to pay for periodic recertification, said Kathie Kobler of the National Board for Certification of Hospice and Palliative Nurses.

The demise of the fee-for-service payment system might make it easier to create financial incentives for quality, which in turn can be used to support credentialing, Joanne Spetz said. Before investing in credentials, individuals and organizations need stronger evidence showing that credentials create, or signal the presence of, higher skills, said Spetz.

To acquire this strong evidence, researchers may need to leverage other studies, said Patricia Brennan. For example, it might be possible to piggyback certification questions on the existing body of effort funded by the National Institute of Nursing Research.

7

Taking the Temperature: Stakeholder Reactions and Suggestions

On the second day of the workshop, participants broke into working groups that focused on high-priority questions and topics within the following categories:

- Using the framework to develop research priorities to advance nursing credentialing;
- Improving research methodologies;
- Short- and long-term strategies to encourage activities related to nursing credentialing research; and
- Stakeholder perspectives, communication, and outreach.

Each breakout group was led by a planning committee member, who presented the group's take-away points in the subsequent plenary session. These plenary presentations are summarized in this chapter, and should not be interpreted as the position of individual presenters or participants.

USING THE FRAMEWORK TO DEVELOP RESEARCH PRIORITIES TO ADVANCE NURSING CREDENTIALING

Presenters: Jack Needleman and Robert Dittus

This workgroup first considered what changes to the Expanded Conceptual Model for nursing credentialing research might be necessary (see Figure 2-2). The discussion focused on a number of points and missing elements included in Box 7-1.

BOX 7-1
Suggested Modifications to the Expanded Conceptual Model

- Reflect the pervasive influence of teams and interprofessional collaboration on work environments and health professionals;
- Represent the layers of organization (units, operating rooms, and so on) that intervene between institutions and individual nurses;
- Account for the visible architecture, as well as the "invisible" one, which may include norms and expectations about credentialing set by leadership;
- Indicate elements in the environment that affect individuals and institutions;
- Reflect the role of payers and professional organizations which, again, have multiple influences;
- Capture the richness of what nurses do and include a temporal element (recent graduates versus experienced nurses) that reflects career paths and re-credentialing patterns;
- Expand the number of feedback loops; and
- Differentiate between what is measured in the credentialing process and how it relates to competency or capability.

In addition, the breakout group discussed the importance of considering whether voluntary certification would create a different framework and array of boxes and interactions than would mandatory credentialing. The breakout group further discussed emergent research priorities in nurse credentialing, emphasizing the following (not in priority order):

- Standardizing definitions of variables across systems and specialties, including current certification status;
- Identifying and measuring relevant confounding variables with validity, reliability, and efficiency;
- Incorporating social determinants of health in electronic health records (EHRs);
- Understanding the relationships among credentials, evidence-based practice, and competency at the individual, team, and organizational levels through understanding causal pathways;
- Determining the impact of credentialing on clinical outcomes (after resolution of other data and measurement challenges);
- Considering the need to be alert to possible unintended consequences;

- Establishing the business case to obtain organizational buy-in, taking into account changing value propositions as health care financing models evolve;
- Accounting for the influence of credentials in team-based practice; and
- Examining the impact of credentials on shaping future practice models.

In the discussion, workshop participants highlighted the need for the "model of care" to account for not just traditional outpatient care, but also community and person-centered care; not just acute care, but also health promotion and disease prevention; and not just individual care, but also group- or population-level services. These broader conceptualizations of what "health care" is involve many more professionals and "hand-offs."

Finally, the breakout group cautioned against making the model so detailed that it is not useful and striking a good balance between clarity and completeness. Ultimately, conceptual clarity about the purposes for the model may guide those decisions, and different levels of detail will be needed for different purposes.

IMPROVING RESEARCH METHODOLOGIES

Presenter: Joanne Spetz

Spetz began with the question "What are the most important knowledge gaps?" The answer has implications for both the research methods and requisite data. In its discussions, the group identified five key questions that researchers should target:

1. What additional descriptive information about nursing credentialing and certification can be developed, including how many people are certified, what certifications do they have, and how are certifications distributed?
2. What is the value of a credential to an individual nurse?
3. What is the economic value to the organization for employing credentialed nurses?
4. Does certification improve nurses' ability to implement evidence-based practices?
5. Which credentials matter for which outcomes?

Many members of the breakout group suggested that gaps in research methodologies are not the underlying problem. Big data analytic methods, translational research methods, qualitative methods, and a variety of analytic techniques from econometrics, epidemiology, biostatistics, and other fields are already available. The real problem is insufficient and inadequate data to answer the priority questions, explained Spetz. To overcome these problems, the group highlighted the need for:

- A common data model and a standardized method for data collection across human resource systems, state boards, and other organizations that would allow data to be merged. This process might start by a thorough review of what data are already being collected.
- Collection of minimum data set elements by state boards of nursing in their re-licensure surveys, which presupposes a more streamlined system than at present. This might be accomplished through collaboration with the National Forum of State Nursing Workforce Centers (which makes recommendations to state boards on minimum data set requirements) and with the Bureau of Health Workforce within the U.S. Health Resources and Services Administration. Technical assistance might be available through the National Center for Health Workforce Analysis to sort out some of the interprofessional data challenges.
- The addition of credentialing information to employers' human resource databases, assuming existing databases can accommodate this information.
- Greater researcher access to existing (and new) data through public use datasets, using de-identified data, if necessary, from state boards of nursing, as an example.
- Standardized, organization-specific data on patient outcomes like that from the Hospital Consumer Assessment of Healthcare Providers and Systems Survey or that may become increasingly available through electronic data systems.

With these kinds of data available, nursing researchers could unravel some questions about the relative importance of nurse, patient, and organizational factors affecting outcomes of interest to all stakeholders. Stakeholders who would benefit from credentialing, including state boards of nursing, should be involved in prioritizing research questions. Stakeholders who can help resolve data shortfalls (e.g., EHRs vendors,

human resources professionals, state boards, employers, nursing informatics experts, and others) should be involved in resolving those challenges.

SHORT- AND LONG-TERM STRATEGIES TO ENCOURAGE ACTIVITIES RELATED TO NURSING CREDENTIALING RESEARCH

Presenter: Kenneth W. Kizer

The breakout group agreed that enough evidence exists to pursue research in nursing credentialing, with the caveats that the quality and quantity of evidence related to individual credentialing and its link to outcomes is not as strong as that for organizational credentialing, began Kizer. Evidence is stronger with respect to mandatory as opposed to voluntary credentialing.

The breakout group recognized that some early actions are needed to pave the way for longer-term activities. Many of these actions were identified in earlier breakout group reports. This group noted the need to clearly identify priorities for research and establish conceptual links between priorities and the data that support them. Kizer noted that priorities—and the related data—will be fluid, changing over time. A good example is how cancer registries are being used now for different purposes than when they were originally designed as the demand for data relevant to quality improvement became a high priority.

Beyond that the group chose not to divide its list of goals into precise time frames. Instead, the group described seven goals, with the first four being the most time sensitive:

1. Getting the data house and information management tools in order, including organizing, collating, consolidating, and establishing coherence within nursing-relevant data scattered throughout the health system;
2. Once existing data have been assessed, identifying data gaps and strategies to fill them, along with consideration of the information management tools (e.g., EHRs, health information exchanges, registries) useful going forward, and refining the data resources over time;

3. Developing and implementing a strategic communications plan, including a consumer advocacy component, to increase understanding of how credentialing relates to patient care;
4. Considering a range of possible funders for this effort—philanthropy, government, professional organizations, large integrated delivery systems, or others—and make an effective case for these investments;
5. Building research capacity and infrastructure among the nurse credentialing organizations to promote consistent research over time, and endowed professorships might provide continuity within academic institutions;
6. Identifying which research methods appear better able to answer the most pressing questions—a task that cannot be done until a sufficient number of studies have been done to enable comparisons; and
7. Although the approach is controversial, using mandates—such as California's required nurse staffing ratios—to stimulate research in related areas.

In response to a question about priority setting, Kizer said the breakout group considered whether the entity that articulates the priorities should be independent from the nursing enterprise, in order to avoid any real or perceived conflict of interest. That entity would need broad stakeholder input, including from the nursing community, he continued. Patients would need to be informed appropriately about the issues to meaningfully engage in the process.

STAKEHOLDER PERSPECTIVES, COMMUNICATION, AND OUTREACH

Presenter: Linda Burnes Bolton

To better understand the type of information that is important in credentialing research, it is important to identify and engage relevant stakeholder groups. To engage in discussions about credentialing research in nursing, the final breakout group presentation began with a review of important stakeholders, such as:

- the full range of payers, who may be interested in identifying factors that improve health outcomes and patient care for their beneficiaries;
- employers across settings, who must make decisions about returns on investment when determining whether to offer incentives to promote nursing;
- new nurses, who must transition from education in school to continuous learning across their careers;
- the National Council of State Boards of Nursing, which can stimulate interest in credentialing through licensure and relicensure requirements;
- risk managers, who are interested in reducing risks associated with adverse outcomes through more competent staff and adherence to evidence-based practice;
- nursing faculty;
- academic institutions;
- accrediting and regulatory agencies; and
- patients and families.

Second, the group discussed strategies to engage these different stakeholder groups. The group suggested that impartial, objective organizations could develop convening activities to educate stakeholders about topics related to credentialing research and to engage stakeholders in a discussion about the perceived value of a certified nursing workforce and high priority research questions. Among the breakout group's other ideas were to:

- develop a broad-based promotional campaign aimed at informing the public about the value of having a certified nurse;
- create a standardized taxonomy for certification because nurses themselves may be confused about whether they are "certified" in the way meant by the professional organizations at the meeting;
- engage risk managers specifically with respect to the need for research, and if research validates the importance of certification, what that importance is; and
- develop transition-to-practice programs for new nurses that culminate in obtaining certification.

The breakout group's proposed campaign for the public would emphasize the value of credentialing, rather than credentialing research. It might be useful to look for common quality- or safety-related threads that run through all certification programs, added Maureen Cahill.

LOOKING AHEAD—ESTABLISHING A COMMON VISION FOR FUTURE DIRECTIONS AND RESOURCES NEEDS IN NURSING CREDENTIALING RESEARCH

The workshop concluded with seven panelists describing some of the overarching messages and ideas generated during the workshop. Jack Needleman began by reiterating the need for data that are more structured, more accessible, and less expensive. Prior studies have used relatively high-level data sources, one-off data systems, or special data collections, and these sources are not sufficient for the agenda proposed in the workshop. On one hand, they are not fine-grained enough, and on the other, many are too small. The future will include mining patients' EHRs and linking them to health care personnel databases that include information on credentials. The certification organizations are "absolutely critical" to data standardization, Needleman said, and should develop and employ a common data set for each certified nurse.

Robin Newhouse suggested development of standard metrics with clear conceptual and operational definitions at both the unit and organizational levels to establish the relationship of the "nurse dose"[1] and nurse and patient outcomes. She suggested that a technical expert panel (including a psychometrician, an informatics expert, and a database expert) could develop this metric, which should be vetted by numerous stakeholders (e.g., the National Quality Forum to encourage widespread diffusion) and pilot tested.

Robert Dittus suggested integrating nursing certification as a theme for researchers with multiple different agendas—health outcomes, patient care, process management—as a way to move forward more quickly. Examples of initiatives already under way that might be leveraged in this manner would include the Patient-Centered Outcomes Research Institute (PCORI) and its 11 Clinical Data Research Networks (PCORI, 2014); foundations and other funding agencies' programs addressing health care quality; the Center for Medicare & Medicaid Innovation, with its focus

[1]Brooten and Youngblut (2006) provide a review of the concept of "nurse dose."

on care coordination and population health; and large health care delivery systems' ongoing research projects. Linda Burnes Bolton also focused on the end goals, suggesting efforts to determine whether and how credentialing contributes to the overall "social good" of helping people obtain and sustain health. She also believed that doing so would establish the usefulness of credentialing research.

Karen Drenkard suggested prioritizing credentialing research that would be useful to individuals and organizations attempting to determine the return on investments. Although some organizations may encourage credentialing "because it seems the right thing to do," she said, research will have to justify those investments in the long run. Understanding the links among certification, practice, and outcomes is essential to any value-based reimbursement model, she said. Similarly, Ken Kizer suggested that, if nursing credentialing and nursing credentialing research are to be viable in the long term, they must "quantifiably demonstrate value both to health and to health care." These are not necessarily the same thing, he said, and they must demonstrate these effects "in ways that are important and meaningful." In the short term, Kizer continued, credentialing research could focus on potential contributions to integrated care.

Lynne Grief emphasized the issue of team credentialing, suggesting that teams of credentialed individuals could identify the best evidence and apply it consistently in practice to achieve the best results for patients.

In closing, Bobbie Berkowitz, the planning committee chair, thanked the speakers, planning committee members, and standing committee members for setting the stage on day one, which lead to fruitful and informative discussions on the last day.

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A

Workshop Agenda

Future Directions of Credentialing Research in Nursing:
A Workshop

September 3-4, 2014
Keck Center of National Academies
500 Fifth Street, NW, Room 100
Washington, DC 20001

WEDNESDAY, SEPTEMBER 3, 2014

8:00 – 8:30 a.m.	**Registration**
8:30 – 8:35 a.m.	**Welcome and Introductory Remarks** *Bobbie Berkowitz, Planning Committee Chair, Columbia University School of Nursing*
8:35 – 9:05 a.m.	**Understanding the Landscape and State of Science in Credentialing Research in Nursing** *Robin Newhouse, University of Maryland School of Nursing*

SESSION I: DEVELOPING A NATIONAL AGENDA FOR CREDENTIALING RESEARCH IN NURSING

9:05 – 9:50 a.m. **Presentation of the IOM Perspective Paper on Identifying a Framework for Nursing Credentialing Research**
Jack Needleman, University of California, Los Angeles

9:50 – 10:05 a.m. **BREAK**

SESSION II: DATA AND RESEARCH METHODOLOGIES

10:05 – 11:30 a.m. **Panel Discussion: Understanding Data Limitations and the Promise of Health Informatics**
Moderator: *Lynne Grief, Planning Committee Member*

- Background Paper on the Significance of Data Harmonization for Credentialing Research
  - *Ronda Hughes*, *Marquette University,* and *Murielle Beene, Department of Veterans Affairs*
- Harmonization and Performance Measure Development to Evaluate Credentialing
  - *Patricia C. Dykes, Brigham & Women's Hospital*
- Developing, Testing, and Refining Measures of Nurse-Sensitive Quality of Care
  - *Nancy Dunton, Kansas University School of Nursing*
- Innovation and Certification: Keeping Up with the Future
  - *Patricia Brennan, University of Wisconsin–Madison*

11:30 – 12:15 p.m. **LUNCH**

12:15 – 1:45 p.m. **Panel Discussion: Challenges and Opportunities in Credentialing Research Methodologies**
Moderator: *Joanne Spetz, Planning Committee Member*

- Presentation of the IOM Perspective Paper on Research Methods, Challenges, and Opportunities
  - *Matthew McHugh, University of Pennsylvania School of Nursing*
- Investigating Causal Pathways and Linkages
  - *Patrick Romano, University of California, Davis*
- Knowledge Discovery Data Analytics Methods: Potential Use in Nurse Credentialing Research
  - *Karen A. Monsen, University of Minnesota* (*via WebEx*)
- New Research Opportunities: Building on the Momentum of the Affordable Care Act
  - *Ellen-Marie Whelan, Centers for Medicare & Medicaid Services*

SESSION III: ASSESSING CORE COMPETENCIES IN NURSING CREDENTIALING

1:45 – 3:00 p.m. **Panel Discussion**
Moderator: *Robert Dittus*, *Planning Committee Member*

- Competency-Based Medical Education (CBME) and Transformation
  - *Eric Holmboe, American Center for Graduate Medical Education (attending via WebEx)*
- Assessing Outcome Performance Competencies in Physical Therapy

- *Jody Frost, American Physical Therapy Association*

- Core Competencies in Nursing Credentialing and Certification
  - *Laurie Lauzon Clabo, MGH Institute of Health Professions*

3:00 – 3:15 p.m. **BREAK**

SESSION IV: IMPLEMENTING A RESEARCH FRAMEWORK—SCIENCE AND POLICY IMPLICATIONS

3:15 – 4:45 p.m. **Panel Discussion**
Moderator: *Karen Drenkard, Planning Committee Member*

- The Future of Nursing, Credentialing, and Efforts to Improve Quality
  - *Susan Hassmiller, Robert Wood Johnson Foundation*
- Encouraging Nursing Certification and Assessment in Health Care Organizations
  - *Kathleen Gallo, North Shore–LIJ Health System*
- Developing a National Focus
  - *Kenneth W. Kizer, University of California, Davis, Health System*
- Getting from Results to Practice and Policy: Implications for Implementation
  - *Sheila Haas, Loyola University Chicago*

4:45 – 5:25 p.m. **Public Comment**

5:25 – 5:30 p.m. **Day 1 Closing Remarks**
Bobbie Berkowitz, Planning Committee Chair

THURSDAY, SEPTEMBER 4, 2014

8:30 – 9:00 a.m. **Registration**

9:00 – 9:15 a.m. **Opening Remarks, Overview of Day 2**
Bobbie Berkowitz, Planning Committee Chair

SESSION V: BREAKOUT GROUPS

9:15 – 9:30 a.m. **Move to Break-Out Rooms**

9:30 – 11:00 a.m. **Break-Out Discussion Session**

Group 1: Using a framework to develop research priorities to advance nursing credentialing research

Moderators: *Robert Dittus and Jack Needleman, Planning Committee Members*
Staff: *Ashna Kibria*

Framing Questions:
(1) What changes to the proposed conceptual framework are necessary?
(2) Based on the conceptual framework, in part, what are the emergent research priorities in nursing credentialing to advance the field?

Group 2: Improving research methodologies and data infrastructures in a changing health care landscape
Moderator: *Joanne Spetz, Planning Committee Member*
Staff: *Sarah Domnitz*

Framing Questions:

(1) What are the most important knowledge and methodological gaps to resolve?

(2) What are the most promising developments in research methodologies, health metrics, and data infrastructures to better evaluate the impact of nursing credentialing?

Group 3: Short- and long-term strategies to encourage activity in nursing credentialing research
Moderator: *Kenneth W. Kizer, Planning Committee Member*
Staff: *Claire Giammaria*

Framing Questions:

(1) Is there enough evidence to pursue research in nursing credentialing?

(2) What are short-term strategies (1-5 years) to encourage continuous activity in nursing credentialing research?

(3) What are long-term strategies (5-10 years) to encourage continuous activity in nursing credentialing research?

Group 4: Targeting stakeholder perspectives in communication and outreach efforts
Moderator: *Linda Burnes Bolton, Planning Committee Member*
Staff: *Monica Gonzalez*

Framing Questions:

(1) Who are the important stakeholders to engage in communication and outreach efforts about the need for credentialing research and credentialing impact?

(2) What strategies could be used to engage different stakeholder groups?

11:00 – 11:20 a.m. **BREAK**

11:20 – 1:20 p.m. **PLENARY: Group Leader Presentations and Group Discussion**
Moderator: *Robin Newhouse, Planning Committee Member*

SESSION VI: LOOKING AHEAD—ESTABLISHING A COMMON VISION FOR FUTURE DIRECTIONS AND RESOURCES NEEDS IN NURSING CREDENTIALING RESEARCH

1:20 – 1:50 p.m. **Planning Committee Panel Discussion:**

- *Jack Needleman, University of California, Los Angeles*
- *Karen Drenkard, O'Neil Center/ GetWellNetwork, Inc.*
- *Kenneth W. Kizer, University of California, Davis, Health System*
- *Robert Dittus, Vanderbilt University*
- *Lynne Grief, Blake Medical Center*
- *Linda Burnes Bolton, Cedars-Sinai Medical Center*
- *Robin Newhouse, University of Maryland School of Nursing*

1:50 – 2:00 p.m. **Closing Remarks**
Bobbie Berkowitz, Planning Committee Chair

2:00 p.m. **ADJOURN**

B

Glossary

Accreditation—"A voluntary process by which a nongovernmental agency grants a time-limited recognition to an institution, organization, business, or other entity after verifying that it has met predetermined and standardized criteria" (McHugh et al., 2014, p. 2; NOCA, 2005, p. 5).

Certification—"The voluntary process by which a non-governmental entity grants a time-limited recognition and use of a credential to an individual after verifying that he or she has met predetermined and standardized criteria. It is the vehicle that a profession or occupation uses to differentiate among its members, using standards, sometimes developed through a consensus-driven process, based on existing legal and psychometric requirements" (McHugh et al., 2014, p. 2; NOCA, 2005, p. 5).

Cloud Computing—"A model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Hughes et al., 2014; NIST, 2011, p. 2).

Common Data Model—A model that defines the core set of data to be captured, how that data will be used, how the elements of the data relate to each other, and the terms used to represent those data elements. It is a prerequisite for service-oriented architecture and cloud computing, supports widespread interoperability, and facilitates standardization of collected data (Hughes et al., 2014).

Competency/Core Competency—Competencies are the skills or capabilities developed or measured by credentialing programs. Examples of competencies include: psychomotor skills and complex cognitive skills; practice-based learning and improvement; communication and clinical skills; patient care and care coordination; professionalism; system-based practice; medical knowledge; and knowledge, skills, and attitudes (Holmboe, 2014; Lauzon Clabo, 2014; Needleman et al., 2014).

Credentialing—"Processes used to designate that an individual, programme, institution or product have met established standards set by an agent (governmental or non-governmental) recognised as qualified to carry out this task. The standards may be minimal and mandatory or above the minimum and voluntary" (International Council of Nurses, 2009, p. 1; Needleman et al., 2014, p. 1). These standards should be defined, published, psychometrically sound, legally defensible, and uniformly tested. The qualified agent should provide objective, third party assessments (Hickey et al., 2014; McHugh et al., 2014; NOCA, 2005; U.S. Department of Labor, 2014).

The purpose of credentialing is to protect the public, enable and enforce professional accountability, and support quality practice and services (Newhouse, 2014). Other goals of credentialing include advancing the safety of health care delivery; improving the quality, processes, and organizational culture of health care delivery, clarifying and defining the roles of the nurse and other members of the delivery team; providing professional support; shaping future health care delivery practice; and, improving job satisfaction and the recruitment and retention of nurses (Needleman et al., 2014).

Data Harmonization—"The process of standardizing definitions for core data elements from multiple sources critical to effective care delivery and reliable research" (Hughes et al., 2014, p. 4, citing Liu et al., 2010). Harmonization supports interoperability of systems within and across organizations (Hughes et al., 2014).

Entrustable Professional Activity—Entrustable professional activities represent the routine professional-life activities of physicians based on their specialty and subspecialty (Holmboe, 2014).

Health Care Informatics—The integration of health care, information management with information processing and communication technolo-

gy, to support the health of people (Bernstam et al., 2010). It involves all aspects of acquiring, organizing, managing, communicating, and using healthcare-related data, information, and knowledge to enable decision making (Hughes et al., 2014; Kulikowski et al., 2012).

Human Capital Theory—Human capital theory postulates that the process of attaining education is evidence of acquired skill (Becker, 1962; Schultz, 1961; Sweetland, 1996; Weisbrod, 1962). From the perspective of human theory, the person or organization is fundamentally changed by the educational and developmental process (McHugh et al., 2014).

Interoperability—"The ability of two or more systems or components to exchange information and to use the information that has been exchanged" (Geraci et al., 1991, p. 610; Hughes et al., 2014, p. 1).

Invisible Architecture—Invisible architecture refers to the structures of culture, leadership, and climate within an organization; by catalyzing the synergies between physicians and nurses, these structures can lead to organizational excellence (Kizer, 2014; Needleman et al., 2014).

Licensure—"The mandatory process by which a governmental agency grants time-limited permission to an individual to engage in a given occupation after verifying that he/she has met predetermined and standardized criteria and offers title protection for those who meet the criteria" (McHugh et al., 2014, p. 2; NOCA, 2005, p. 5).

Meaningful Use—Meaningful use requires that electronic health care systems are used to improve the quality, cost, and outcomes of health care (CMS, 2014), and that credentialing data be linked to operational, economic, and patient outcome data, and made accessible to researchers (Hughes et al., 2014).

Signaling Theory—Signaling theory postulates that credentials are markers of the preexisting characteristics of individuals (e.g., intelligence and motivation) and organizations (e.g., baseline resources) that pursue and attain credentials (Arrow, 1973; McHugh et al., 2014; Spence, 1973; Stiglitz, 1975; Weiss, 1995).