TERCAP: Creating a National Database on Nursing Errors

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This article presents an overview of contemporary patient safety initiatives, continuing challenges specific to the creation of valid and reliable evidence for healthcare policy, and the National Council of State Boards of Nursing (NCSBN) initiative to illuminate the role of nursing practice in patient safety, error reduction and prevention. A brief review of national efforts on patient safety and specifically nurses' role in patient safety provides the context for changes in NCSBN strategies from individual nurse based efforts to system and practice based efforts. The role of classification and computerized data systems for policy are reviewed along with the challenges to classifying nursing practice breakdown based on an standards of excellent nursing practice. A taxonomy of nursing practice breakdown is presented along with the implications for policy and change.

Patient Safety Initiatives

Since the Institute of Medicine (IOM) report *To Err is Human*[1] was released in 1999, reporting that between 44,000-98,000 Americans die from medical errors annually, considerable national professional and societal attention has been given to the epidemic of errors

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in medicine.[2] Subsequently, additional major reports entitled *Crossing the Quality Chasm*[3] and most recently *Keeping the Patient Safe: Transforming the Work Environment of Nurses*[4] have been published. The IOM, in *Crossing the Quality Chasm*,[3] reports:

- Only 55% of patients in a recent random sample of adults received recommended care, with little difference found between care recommended for prevention, to address acute episodes or to treat chronic conditions.[5]
- Medication-related errors for hospitalized patients cost roughly $2 billion annually.[1,6]
- 18,000 Americans die each year from heart attacks because they did not receive preventive medications, although they were eligible for them.[7,8] Misdiagnoses/million occur in 20,000 – 80,000 of heart attacks in the ED.[9]
- Medical errors kill more people per year than breast cancer, AIDS, or motor vehicle accidents.[10]
- Health-care errors are the seventh leading cause of death in the US, costing $376 billion annually.[1]

Many agree that concrete strategies are needed that allow for the prevention of errors. Errors are costly to patients minimally, in terms of efficacy and time, and maximally, in term of discomfort and even harm or death. Errors are also costly to health care professionals who often bear the guilt of causing harm or death to another and violating the notions of good practice that guide their practice. Recommendation 7.2 of the third IOM report (2004) states:

> NCSBN, in consultation with patient safety experts and health care leaders, should undertake an initiative to design uniform processes across states for better distinguishing human errors from willful negligence and intentional misconduct, along with guidelines for their applicability by state boards of nursing and other state regulatory bodies.[4]

This report recognized that nurses are on the "sharp end" of patient care delivery, and that their practice deliberately includes error prevention and the promotion of patient safety. Nurses have the most direct contact time with patients who are hospitalized. They deliver, monitor and manage most patient therapies, often adjusting the dosages of medication within safe ranges according to needs and responses.

Evidence and Policymaking

Developing better institutional environments for patient safety requires understanding the multiple sources and nature of breakdowns in promoting safe patient care. An evidence-based policy process is informed by the collection of valid and reliable data and by ongoing evaluation. This process includes identifying the problem, developing a plan to address the problem, judging the feasibility of the plan, guiding the implementation of the plan, and then providing evidence from evaluation as a basis for any needed future revisions.[11] Creating the link and closing the gap between best guess and valid and reliable evidence are challenging for several reasons.[12] The most significant is the lack of understanding of the nature, scope and causes of safety breaches and credible evidence for prevention and remediation. All four of the specific gaps in reliable evidence suggested by Gray and Muir[13] exist in patient

safety related to nursing care: the relevance gap, in which there is an absence of high quality data to make policy decisions; the publication gap, in which a limited amount of information about evidence is published in scientific journals; the hunting gap, which describes the difficulty of finding published research; and finally the quality gap, in which critical appraisal of evidence that avoids misleading or biased conclusions is missing. NCSBN has designed a new instrument to collect a national database on nursing errors related to practice breakdowns reported to State Boards of Nursing (SBONs) as a means of providing better evidence for SBONs, but also for nurses, nurse educators and health care delivery institutions.

Background of the Initiatives

Historically, SBONs in the United States have focused on a nurse's personal and professional responsibility in relation to an alleged error. While a SBON considers patient factors, nurse's working conditions, and system issues, the boards have not had a standardized method for considering or classifying the types of nursing breakdown. Nor has a systematic review been available at the state or national level that considers caregivers, patient factors, nurse characteristics, working conditions (e.g. length of shift, staffing, etc.) and other system characteristics that may have contributed to the nurse's error. Records of SBON procedures for evaluating nursing errors have focused on the individual nurse's responsibility and the board's evaluation and subsequent recommendation on the nurse's culpability.[14] However, these investigations ignore a wide array of information available in the document based investigatory file such as system characteristics, nurse education, and patient and nurse characteristics.

In contrast, the IOM calls for a systems approach similar to that taken by airlines. Studies found that the majority of airline accidents are caused not by technical failures, but by breakdowns in communication. Benner and colleagues[14] identified an urgent need for decreasing health care errors that are typically framed in an oppositional "either/or" approach. One either upholds a model of individual agency and responsibility or focuses on a "system" approach that identifies aspects of the environment, such as clear labeling and redundant checking, or decision support systems that identify contraindications, correct drug dosages and drug incompatibilities.[15] But these two approaches do not stand in opposition to one another. Both are needed, and each can reinforce and support the other. System approaches can redesign and improve practices and individual performance. And it takes collective action of practitioners to institute system-wide reform.

NCSBN Initiative

In 1999, the NCSBN convened an expert panel to examine breakdown in nursing practice. The Practice Breakdown Advisory Panel (PBAP) argues that the debate becomes oversimplified by focusing on exclusively these two opposite poles: the agency of the individual or the power of designing systems as impersonal protections in an ongoing system of rules, policies and information that support the individual's practice. While the systems approach is designed to be inclusive, it does not account for knowledge work and problem solving required in under-determined complex practices such as nursing and medicine. The PBAP proposed practice-based guidance and problem solving by professional practitioners as

sources of and as approachs to error reduction in health care. Another approach is to inform patients to be guardians of their safety where possible; however, when patients are acutely ill their ability and knowledge for self-protection are diminished. Individual responsibility, practice based professional responsibility, and patient self-protection have distinct moral sources and discourses; however, phronesis, judgment and wisdom lodged in the character and skill of the practionitioner engaged in actual practice situations and lodged in a professional practice tradition undergird and sustain a systems approach, which synthesizes individual practitioner agency and patient self-protection approaches. A systems approach is based upon a post-hoc analysis and redesign of a system based upon unsafe performance. In complex under-determined practices, a systems approach is most effective when designed with a view of supporting and sustaining clinical judgment or phronesis—ongoing problem solving and practice improvement based upon notions of good practice, collective attentiveness, experiential learning and practice development in local communities of practitioners.

Phronesis encompasses the perception, relational work, and judgment of practitioners engaged with other human beings.[16] Phronesis was defined by Aristotle as ethical and clinical judgment carried out with skilled know-how and wisdom. Nursing offers a good example of phronesis when viewed as a basic human encounter lodged in a practice that requires skillful ethical comportment and ethical clinical reasoning. Aristotle was the first to point out distinctions between phronesis and techne. Techne, in contrast to phronesis, has to do with the making of things and can be standardized as a technique, algorithm or order. But phronesis involves relationship, mutual influence, and ethical comportment (behavior) in complex and under-determined situations. This distinction between phronesis and techne in both nursing and medicine has major implications for classifying nursing and medical errors.

In the practice of medicine and nursing, science and technology increase certainty about measurement of signs and symptoms. The practice of objectively measuring signs and symptoms and evaluating basic scientific research and clinical trials can greatly assist in the reduction of errors and improve clinical judgment. A caveat is that regardless of the level of objectivity or the validity of scientific evidence, if the measure and the phenomenon of interest are not appropriately linked, reduction of errors and improved clinical judgment will not occur as anticipated. Further, the selection of inappropriate measures can result in inappropriate conclusions and potential errors. No one would recommend going back to guessing body temperatures by human touch alone. However, even the most formal measurements cannot replace the perceptual skill of the clinician to recognize when a measurement is relevant or to recognize the meaning of a particular measurement in a particular patient situation. Also, following the course of the patient's development of signs and symptoms (the trajectory or evolution of signs and symptoms, i.e. temporal sequencing), informs the clinician's understanding of the meaning of the signs and symptoms. This may seem patently obvious to any practicing clinician, yet current strategies for applying algorithms or making particular clinical judgments based upon aggregate outcome data alone ignore the clinical know-how, relational skills, and need for clinical judgment as reasoning about the particular across time. Technique is defined here as pre-specified outcomes that can be reduced to routine, predictable, standardized care.

A more robust understanding of the prac-

tice of nursing and doctoring needs to be developed. This is especially true in an era when science and technology have become the dominant publicly legitimized discourses for modern professional practices. However, a broader base of skilled know-how and clinical and ethical judgment over the course of events for a particular patient is needed and provides better outcomes than science and technology can alone supply.

The systems approach is vital to preventing predictable errors and correcting systems designs that contribute to errors once they have been identified. However, a systems approach cannot replace situated problem solving based upon professional judgment or phronesis lodged in a community of practitioners whose collective agency and efforts exceed what any one individual can accomplish. Phronesis offers a missing link between individual responsibility and a systems component. A community of practitioners shares notions of good internal to a practice,[18] holds socially-embedded knowledge, participates in a scientific community and in a shared history of experiential learning, often told in narratives of past learning.[19] Notions of the good refer to the goals and ends of a practice, valued activities and their significance in particular situation. Even in a pluralistic society, notions of the good (the in-order-to's or the for-sake-of-which) are restricted to the situated goals and concerns of the persons involved and the restrictedness or boundedness of the situation. The shared moral agency of a community of practitioners is not adequately captured in the discourse of individual responsibility or in the impersonal language of systems engineering focused on correcting past mistakes. A community of practitioners creates multiple perspectives and relationships of responsibility in complex, fast-paced, under-determined health care situations. Consequently, a systems engineering approach depends on the practice tradition and the moral agency of individuals and on a moral community of practitioners to generate and sustain a systems approach.

Patient Safety and Nursing Practice

The PBAP work calls attention to "practice" as a significant middle term between a focus on the system or the individual in designing measures to improve patient safety. The ethos and standards of good practice are lodged in professional practice itself through educational institutions, work settings, and regulatory bodies. Nursing errors are sometimes subsumed under "medical errors," "physician errors" or "medication errors" with little public or professional awareness of the nature and seriousness of errors that nurses could prevent or cause. Nurses provide the closest and most consistent surveillance of patients. In some situations, institutional and resource conditions for good practice are missing. There may be staffing shortages, poor inter-professional communication practices, or errors that occur as a result of breakdowns in the institutional support essential to fulfill the minimal professional standards for good nursing practice. The practice is about relationships for nurses, physicians, social workers and other helping professionals dedicated to health promotion and care of the ill. This practice requires ongoing attentiveness, perceptiveness, responsive problem solving and effective communication. Multiple vantage points from different disciplines, specialties and experiential backgrounds offer insights and correctives to ongoing situations that would go undetected by individual practitioners. Health care workers functioning within a systems approach can detect and correct predictable er-

rors. In this context, problem solving occurs as individual and collective responsibility that operates within a community of practitioners. Practice-based approaches are particularly effective in under-determined situations and for improvement in the practice over time by maintaining a narrative understanding of past errors and ongoing system improvements and by offering different perspectives in situations where blind spots or experiential learning from past concrete cases have particular relevance to the current situation.

A systems approach integrated with and complementary to a practice based approach can assist in limiting practice areas where constant surveillance and attentiveness are required. However, in complex fast-paced systems, attentiveness can never be eliminated. The goal is to engineer what areas can be placed in the background and to create environments that facilitate attentiveness required by nurses and other health care professionals. Based upon this vision of the roles of systems engineering, an ongoing community of practice and practice development, the PBAP inductively generated major aspects of safe nursing practice. Disruption or absence of any of these aspects of good practice was called practice breakdown.

Members of the PBAP recognized that SBON provide a unique source of data specific to errors, practice breakdown and patient safety. For these reasons the PBAP embarked on the challenging process of identifying and extracting key information from board of nursing investigative cases, categorizing these data into a taxonomy that would integrate issues specific to the individual, the practice of nursing, and the system in which nursing is practiced.

Developing a Classification System Based upon a Vision of Good Nursing Practice

The lack of descriptive classifications of excellent nursing practice and concomitant sources of nursing practice breakdown is a result of the institutional and public invisibility of the surveillance and quality control provided by nurses. This invisibility is dangerous because in it prevents accountability and adequate feedback to large inter-locking systems ,making it difficult to maximize nurses' contribution to improving patient safety. The invisibility of nurses' contribution is due, in part, to the hidden work of nursing practice that is often classified as "other," leaving little trace in classification schemes where the predominant focus is on medical practice.[20]

NCSBN's effort to develop an instrument to describe and distinguish types and sources of nursing error was well underway when the first IOM report was written. Work continued on developing the Taxonomy of Error, Root Cause Analysis and Practice Responsibility (TERCAP), an instrument to be used for case analysis at the SBON level in order to develop a national database on patient care.[14] The TERCAP is an investigation intake instrument to classify nursing practice breakdown reported to SBONs. It includes the root causes of practice breakdown in nursing practice, examines the nurse characteristics (including the work demands of the nurse), the patient characteristics, the types of nursing practice breakdown, and finally, the system characteristics associated with the particular error. See Table 1 for the eight categories of safe nursing practice that were identified within the TERCAP.

The TERCAP is deliberately designed to influence investigations at the SBON level to develop a national database that would protect

the public by increasing patient safety not only by re-educating and disciplining nurses but also by developing an evidence-based approach to regulation through recommendations for educational and system change to reduce nursing error within and across states. The use of the term, Root Cause Analysis (RCA) in the TERCAP title is designed to encourage SBONs to think about the root causes of the error, and not just focus on the nurse's responsibility for the error under ideal, context-free circumstances such as adequate staffing or supervision. In 1998, the Joint Commission for Accreditation of Health-Care Organizations (JCAHO) implemented standards and recommendations related to the identification, reporting, analyzing, and presenting of sentinel events for hospitals so that weaknesses in procedures, systems, and employee habits could be determined and rectified. The hospital RCA process, however, often does not analyze beyond the more obvious and objective behaviors, systems, and processes to include the examination of human interactions and underlying norms, values and beliefs. As a result, fundamental contributors to practice breakdown and resulting patient care error continue to be misunderstood, mismanaged, and/or minimized.[22]

The TERCAP cannot accomplish full RCA retrospectively because of the delay in and specific focus of the analysis, but it can direct the investigation toward more comprehensive and systemic causes of nursing errors. Findings related to system and education sources of error are not currently incorporated into the regulatory efforts of many SBONs but will form an educational and informational arm of the work of the SBONs to promote patient safety. The analysis and reporting of this information is important for both health care professionals and health care consumers. As Emrich notes:

> What is learned from these errors in cases of nursing practice breakdown would be used to influence health care and nursing policy at all levels: local, state, national, and possibly international. However, changes in health care policy requires the input and action of legislators and officials, who do not have an in-depth understanding of the mindful activities that nurses take on behalf of their patients (83).[23]

This is an important reason for the nursing profession to categorize and name its seemingly invisible activities, especially those related to patient safety. In addition, the PBAP believed that TERCAP findings would provide data to strategically focus on error prevention and distinguish human errors from willful negligence and intentional misconduct as recommended by the 2004 IOM report.

Based on an inductive content analysis of the intake files of cases reported to SBONs and with the goal to add items related to system and practice responsibility, the PBAB reviewed three to four paper based intake files of nurses who had been reported to 14 SBONs and generated the following major categories of information to be included in the State Board's Investigatory Report. The TERCAP instrument is comprised of the following main sections:

I. Patient profile
II. Patient outcome
III. Setting of error
IV. System issues
V. Health care team
VI. Nurse profile
VII. Intentional misconduct or criminal behavior
VIII. Practice breakdown category: Safe Administration of Medica-

tion
IX. Practice breakdown category: Documentation
X. Practice breakdown categories
a. Attentiveness/Surveillance
b. Clinical Reasoning
c. Prevention
d. Intervention
e. Interpretation of Authorized Providers' Orders
f. Professional Responsibility

TERCAP Design Challenges

While classification systems typically strive to develop non-overlapping categories, in an under-determined and complex practice such as nursing or medicine, developing completely non-overlapping categories would create almost an endless list of possible practice breakdowns. A tradeoff must be made between an endless list and a list that will "make sense" to practitioners and users of the instrument. Each of the intents of the eight practice breakdown categories is linked to proximal causes for error.

Defining practice breakdown presented numerous challenges. From a nursing practice perspective, nursing practice breakdown is related to more than poorly administered health care treatments and medications. In addition to the specific nursing tasks of administering prescribed health care treatments and medications, nurses provide front-line surveillance of the patient, monitoring the patient for responses to therapies and titrating therapies in response to changes in patients' physiological and psychological states. Thus any classification of types of nursing practice error must include at least two major aspects of nursing practice:

1. Nurses' work uses and is intertwined with medical diagnoses, so in terms of a "diagnostic system" (i.e. identifying injury or patho-physiology and directly seeking to intervene in the deficit or problem), the medical/physiological taxonomy is most appropriate.
2. Nursing's uniqueness lies in the vast "other" left out necessarily by any diagnostic approach of naming deficits and correcting them. Nursing work attends to the omitted "other category" of the patient's vulnerability as a result of illness (the human experience of disease), such as suffering, and diminished lifeworld and sense of possibility, typically left out when the focus is primarily on "medical diagnostics and cures." It also includes the management of treatments and patient-family education for managing multiple chronic illnesses.

Challenges from the system were also present. The problem is further complicated by institutional constraints to good or even good enough nursing practice. Meeting and responding to the other may clash with the bureaucratic goals of care for the many in the most cost-efficient manner. For all these reasons, nursing practice requires that the nurse develop moral agency and interpersonal skills of patient/family involvement to advocate for the patient and provide a front line defense against nursing error. Good and self-improving nursing practice demands experiential learning and character development on the part of the professional nurse, just as it demands ongoing system design and re-design to create the best institutional processes and structures for patient safety that include optimizing the delivery of nursing care.

Theoretical Premises for Developing a Classification of Nursing Error

As Bowker and Starr[20] point out, "…Distinctions among things is the prime negotiated entity" in the development of a classification scheme. Since this was an instrument developed for SBONs for the purpose of prospectively classifying types of errors, or individual and system contributions to the error along with patient and nurse outcomes, meaningful classes of nursing errors needed to cover the broad range of good nursing practice.

For example, disrespect for a patient and failure to advocate for the patient's concerns demonstrate a lack of professional fiduciary responsibility for the patient. Disrespect can cause psychological harm when it leads to diminished attentiveness and response to the concerns or requests of the patient or family. When a patient's or family's plea for assistance is not heard or a change in clinical condition or symptoms is not attended to, the patient may be severely harmed or even die due to this lack of attentiveness.

The nurse-patient relationship sets up the conditions of possibility for the patient to disclose concern, fears and discomforts. If the nurse is too hurried or too task-oriented to notice the patient's and family's experience, then the level of disclosure on the part of the patient/family will be constrained. Likewise, attunement to and engagement with the patient allows the nurse to notice subtle changes. In situations of patient neglect, the nurse's attention is attuned to his/her perceived needs before or even instead of those of the patient.

Clinical reasoning requires engaged reasoning across time about the particular through changes in the patient's condition and changes in the clinician's understanding of the patient's situation.[24] Disruption in this engaged reasoning has great potential to lead to nursing error.

TERCAP Overview

The TERCAP instrument seeks to provide a meaningful account of the educational, nurse, system, and practice environment contributions to the error. Practice breakdown categories were inductively generated from actual cases of nursing errors reported to SBONs. Naming the categories of breakdown remained in the context of commonly accepted nursing practice standards and goals of good practice. Practice errors do not fall into isolable sets of errors since one error will cause a cascade of other practice errors or breakdown. Even so, the PBAP sought to develop categories that were meaningful to aspects of good nursing practice and to the nurse's moral agency, knowledge, and skill. The PBAP questioned whether nursing errors are predictably situated in particular circumstances and practice demands. Bowker and Starr, in their groundbreaking work *Sorting Things Out: Classification and Its Consequences,*[20] note that: "Classifications are powerful technologies. Embedded in working infrastructures they become relatively invisible without losing any of that power" (50).[20] Bowker and Starr suggest that a classification system have the following characteristics: comparability, visibility and control. Each of these characteristics is reviewed in relation to the development of the TERCAP Instrument:

Comparability. Within SBONs, the goal was to develop an instrument that would be able to compare error types and system influences across time. The instrument was designed to create the possibility of prospective studies of the effectiveness of board remediation actions. To the extent possible, the goal is also to

compare the medication classification of error and patient harm.

Visibility. The tool was constructed with the assumption that many aspects of nursing work that both prevent and cause errors in patient care are currently invisible (or at least not noticed or articulated) and therefore not easily tracked by the current classification systems.

Historically, regulatory boards have disproportionately focused their attention on the individual nurse's culpability and responsibility for patient care errors. The goal of developing a nursing error database using the TERCAP was to broaden this focus in order to track educational and practice system contributions to nursing errors. Invisibility can come from an aspect of work being taken for granted, so that no one thinks of naming it. The nursing roles of error prevention, attentiveness and surveillance, and aspects of nursing interventions, for example, if left invisible, create a dangerous gap in the ability to track and reduce these errors. The artfulness in creating a classification scheme lies in what is made visibles and therefore can be measured and problematized, as well as what should be left out of the classification system because it seldom leads to errors in patient care. This artfulness can only be achieved with ongoing development and refinement of a data collection instrument.

No classification system can or should render all activities and work visible. Sorting out what aspects of practice breakdown are most relevant to patient harm requires selecting the most salient contributions to patient care breakdown. Another way to state this is that classifications systems as formal systems run into the limits of formalism. They cannot make explicit all the knowledge within the universe to be formalized or classified. Those constructing classification systems have to determine what it is safe to leave invisible and have to identify the appropriate sources and kinds of visibility and invisibility. Wise psychiatrists or psychologists do not think that a full understanding of one of their patients is captured by formally classifying the patient using the DSM IV. The major functions of official classifications systems, as Bowker and Starr[20] point out, are: a) retrieving records; b) documenting work; c) providing legitimacy and recognition for work; d) providing strategies for accounting, costing and getting reimbursed for services rendered; e) communicating and coordinating work across boundaries of specific workers; f) guiding knowledge development or reification of work (making obvious the abstract).

Bowker and Starr[20] point out that classification systems can also trivialize a practice. Classification systems will be trivializing or even sub-intelligent when they consistently overlook a major domain of relevant work (e.g. the non-diagnostic non-elemental aspects of nursing work) or when they overlook the intent and content of the work (i.e. the ends and meanings inherent in nursing work and practice goals). The reification of documentation systems and formal categories of work captured in information systems will be a problem to the extent that organizations consistently overlook the shadow world of the unclassified.

Control. Control, like comparability and visibility, is an inevitable outcome of a classification system. All classification systems lead to some form of control, and control, like visibility, may be useful or detrimental.[20] The goal of the TERCAP is to identify the system correlates and consequences to different patients of the different types of nursing error. More systematic and comprehensive information about the types of patient care errors associated with nursing practice will make it possible to target repeated nursing errors for error reduction and prevention through improved education, nurs-

ing care management, and regulatory efforts.

TERCAP: Eight Categories

Eight categories were determined to reflect nursing practice based on a vision of good nursing practice and Bowker and Starr's[20] beliefs and tenets about classifications. In this section, an overview and description of the categories is presented. Table 1 (next page) includes a brief description for each category.

1. *Safe Medication Administration*. The professional nursing standard of the six rights of medication administration is used by nurses as a safety check before the administration of any medication. The consistent use of this safety procedure diminishes the chances for medication errors. It does not effectively prevent mistaken identity of medication through similar names, or packaging. Also problematic are medications with difficult to determine dosages or with high alerts (e.g. potassium chloride). All of these are system problems and contributors to error that need to be addressed in order to increase patient safety.

Since nurses are the ones who most often administer medications, they are at the "sharp end" of medication errors[4] (IOM, 2004) that may start in the pharmacy, with the physician, or with the nurse.

Medication errors accounted for 20% of the primary errors reported in the PBAP pilot study. One death was attributable to medication error. Male patients experienced more medication errors than female patients, indicating that there could be predictable gender patterns in nursing errors if this trend continues in larger randomized samples. The most frequent type of medication error in the pilot study was giving the wrong dose.

2. *Documentation*. Accurate record keeping and careful documentation are essential parts of nursing practice that serve to protect the welfare of patients. Since documentation is an aspect of all nursing care, it is often an element in practice breakdown as well. Documentation errors include both inaccurate charting and omission of documentation. When therapies or medications are not immediately documented on a patient record, patients are at risk for receiving the therapy twice. This is especially a problem for pain and sedation medications. Likewise when medications are charted before they are actually given, the patient is at risk for omission of the medication if interruptions occur and the medication is not given. False documentation or the attempt to cover up a patient care error is a most egregious act because it endangers the patient and prevents interventions to assist the patient and future efforts to prevent the error from occurring again.

3. *Attentiveness / Surveillance*. The goals of nursing surveillance or vigilance are the early detection of a downturn in a patient's health status or the advent of an adverse event and the initiation of activities to "rescue" the patient and restore health. Fairman[26] discussed intensive care nurses' use of "watchful vigilance" (56) as a protective measure. When this does not happen, "failure to rescue" is said to occur. The concept of failure to rescue has been tested and validated as an indicator of the quality of acute hospital care for surgical patients.[27] When there are higher levels of nurse staffing, the incidence of failure to rescue decreases.[28,29]

In a recent study,[23] the concept of nursing vigilance was examined, using the initial version of the TERCAP Instrument. Emrich notes that SBON reviews of investigative information about practice breakdowns focus on minimally acceptable nursing practices for the specific circumstance. When nursing practice falls below this minimally acceptable thresh-

Table 1. TERCAP: Standards of Safe Nursing Practice

1. *Safe Medication Administration*: The nurse administers the right dose of the right medication via the right route to the right patient at the right time for the right reason.

2. *Documentation*: Nursing documentation provides relevant information about the patient and what was done in response to his or her needs.

3. *Attentiveness / Surveillance*: The nurse monitors what is happening with the patient and staff. The nurse observes the patient's clinical condition; if the nurse has not observed a patient, then he/she cannot identify changes if they occurred and/or make knowledgeable discernments and decisions about the patient.

4. *Clinical Reasoning*: Nurses interpret patient's signs, symptoms and responses to therapies. Nurses evaluate the relevance of changes in patient signs and symptoms and ensure that patient care providers are notified and that patient care is adjusted appropriately.

5. *Prevention*: The nurse follows usual and customary measures to prevent risks, hazards or complication due to illness or hospitalization. These include fall precautions, preventing hazards of immobility, contractures or stasis pneumonia.

6. *Intervention*: The nurse properly executes nursing interventions.

7. *Interpretation of Authorized Provider's Orders*: The nurse interprets authorized provider orders.

8. *Professional Responsibility / Patient Advocacy*: The nurse demonstrates professional responsibility and understands the nature of the nurse-patient relationship. Advocacy refers to the expectations that a nurse acts responsibly in protecting patient/family vulnerabilities and in advocating to see that patient needs/concerns are addressed.

old, SBONs consider what remedial measures or licensure sanctions are appropriate for the nurse that will be in the best interest of public safety. In doing so, SBONs consider many factors including the severity of nurses' behaviors and the circumstances surrounding the practice breakdown. In this study of nursing vigilance, the TERCAP differentiated behaviors in which the nurse disregards his/her professional responsibilities from behaviors that occur within the course of nursing practice, and where the nurse has no intent to fall below nursing standards but encounters circumstances that interfere with appropriate vigilance. The Nursing Vigilance study indicated that nurses who did not adhere to their professional responsibility to provide care or demonstrated nursing vigilance were more likely to incur a publicly disclosed board action than nurses whose behaviors reflected diminished nursing vigilance as captured by other TERCAP categories such as clinical reasoning. This research finding demonstrates that the TERCAP instrument does distinguish between willful, neglectful or illegal behavior and that it is responsive to IOM (2004) Recommendation 7.2.[4]

Emrich's findings[23] resemble a case-control study[30] which found that students' "unprofes-

sional behavior" in medical school, serious enough to receive written evaluative notes, predicted later disciplinary actions by State Boards of Medicine. The American Board of Internal Medicine defines professionalism as requiring "the physician to serve the interests of the patient above his or her self-interest." Professionalism aspires to altruism, accountability, excellence, duty, service honor, integrity and respect.[31]

4. *Clinical Reasoning*. Nurses interpret patients' signs, symptoms and responses to therapies and evaluate the relevance of those changes to ensure that patient care providers are notified and patient care is adjusted appropriately. Clinical judgment is usually intertwined with other causes of practice breakdown; however, the focus of this category is on the interpretation and understanding of patient signs and symptoms, responses to therapies, and clinical implications of patient changes over time. The type of error under this category most frequently chosen in the pilot study was: clinical implications of signs, symptoms and/or interventions not recognized or misinterpreted. Inappropriate judgment may be highly influenced by unfamiliarity with the setting or treatment, and/or knowledge or skill deficit on the part of the nurse. It is useful to sort out what contributes to a breakdown in good clinical judgment, since problems of inattentiveness and knowledge deficit leading to poor clinical judgment require different corrective measures at the system and nurse levels.

For example, nurses titrate drugs and other therapies according to their assessment of patient responses (e.g. change patient positioning in response to patient shock; titrate IV medications to maintain the patient's vital signs within acceptable parameters; assess patient pain and adjust pain medication; administer sliding scale insulin in response to patient blood sugars).

5. *Prevention*. Health care institutions are hazardous places over and above the physiological threats created by being bedridden due to injury or disease. The nurse follows usual and customary measures to prevent risks, hazards or complications due to hospitalization or illness. These include safety hazards of highly technical equipment and procedures, nosocomial infections, fall precautions, preventing hazards of immobility, contractures, stasis pneumonia et cetera. The practice breakdown category is related to the prevention of hazards to patients that occur when nurses do not follow the usual measures to prevent hazards or complications due to illness or hospitalization. Patients who did not receive the usual preventative measures are at risk for harm or death.

Preventive nursing care related to the hazards of hospitalization and patient immobility is a major area of potential practice breakdown, but, like all "omitted actions," is the hardest to track. Immobility hazards such as, decubiti, stasis pneumonia, pneumonia due to poor mouth care or problems with suctioning, deep vein thrombosis, technological safety hazards, nosocomial infections, patient falls, dehydration, and high or low blood sugars can all be indications of a lack of standard preventive measures by nurses.

Nurses are the patient's front line of defense. In a study of critical care nurses, Benner, Hooper-Kyriakidis and Stannard[24] found that a central practice function of nurses is the monitoring, managing and preventing of practice breakdown or direct patient care errors. This finding is in keeping with the recent IOM report (2004) statement about nurses' role in patient safety:

> While performing these assessments (and also when delivering therapeutic treatment and patient education), nurses

are functioning at the "sharp end" of the health care system because of their immediate link to the patient. This ongoing vigilance function often thrusts nurses into a role that has been described as the "front line" of patient defense.[32] Studies of organizations with a high track record of high reliability and safety have shown that such vigilance by front-line workers is essential for detecting threats to safety before they actually become errors and adverse events.[33,34] Because licensed nurses and nursing assistants work at the "sharp end" of health care delivery, they are key instruments for carrying out such vigilance in health care.

6. *Intervention*. Nurses administer most ongoing therapeutic interventions for institutionalized patients. The practice breakdown involving timely and appropriate nursing interventions can be a serious breach to patient safety and can be associated with many system problems, such as reliance on memory, poor communication, work overload, etc. Nursing errors related to faulty and/or lack of intervention place patients at high risk for harm or death. In our pilot work, nurses making these errors had been in their current positions two or fewer years. The two major types of practice breakdown in this category were error in performance of intervention and lack of timely intervention. Aiken[28] and her colleagues have used failure to rescue as a measure to assess the effectiveness of nursing and medical care. Failure to rescue a patient can occur for many reasons, but when the initial interventions of establishing an airway, breathing and circulation are delayed or initiated improperly, there is no chance of patient rescue.

7. *Interpretation of Authorized Provider's Orders*. Many opportunities for error come from interpreting the many aspects of the provider's order. The transition to computerized provider orders, so that hand written and oral orders are removed from practice to the extent possible reduces misinterpretation of health care provider orders. Also the elimination of confusing abbreviations and decimal placements in dosages of medication will eliminate many errors that occur as a result of misinterpreting health care provider orders.

In the pilot work, breakdown in communication was most likely to occur if nurses had two or fewer years in their current positions. Misinterpretation of health care provider orders was often due to missing a provider's order and was more likely to occur during twelve-hour shifts. Missed or mistaken prescriptions or provider orders are problems that could be almost completely resolved with improvements in automated orders and with automated Order Alert systems for nurses.

Missed or mistaken orders are dangerous to patients since essential medications or therapies may be omitted or wrong therapies or medications may be administered. This is often caused by system problems such as "verbal or telephone" orders or the notoriously poor handwriting of providers. However, the nurse is responsible for understanding and verifying the safety of any provider order that he or she carries out.

8. *Professional Responsibility / Patient Advocacy*. Nurses, like other professionals, have an ethical and fiduciary responsibility to advocate for their patients' best interests and well-being. Lack of responsibility and/or patient advocacy occurs when a nurse does not act responsibly for the patient's well-being. Neglect, disrespect, or failure to respond to patient requests for help can cause harmful errors. When nurses ignore either patients' or families' information or fail to advocate on their behalf, patient harm

is likely to occur.

The choice of nurses not to notify the physician of condition changes in the patient is the most frequent form of practice breakdown in this category. While nurses bear professional, legal and ethical responsibility in both instances, it was found that system and physician factors strongly influenced delay or deliberate avoidance of calling the doctor. Deliberately covering up an error is both professional and system problems. If a system does not have a strong culture of patient safety and if those who report errors are blamed and negatively sanctioned instead of being assisted in improving performance and system problems to prevent future such errors, under-reporting and covering up of errors will continue to be a problem.[4]

Recommendations for the Use of the TERCAP Instrument and Policy Implications

The use of the TERCAP as an electronic intake instrument used in all states and kept by the NCSBN opens new avenues for the protection of the public from practice breakdown in all types of settings. The variability of patterns of errors can be compared between states and between types of systems, nurse characteristics, patient characteristics, working conditions, and system characteristics. For example, in our pilot work we found that patients with limited consciousness or cognitive abilities were more susceptible to extreme harm or death due to patient care errors. This calls for higher nurse-patient ratios for cognitively impaired patients and increased systems of protection for these patients. The use of TERCAP will help to identify behaviors of individuals and health care teams, as well as system components that contribute to practice breakdown. Learning from the experiences of nurses who have been involved in practice breakdown can become a powerful tool to promote patient safety.

Though the TERCAP was designed for use by SBON and NCSBN to create a comprehensive database on nursing errors reported to SBONs, it could also be used in all practice settings. Recent research in the hospital setting by nurse executive and researcher Scott[21] utilized the TERCAP to categorize and analyze the individual errors of nurses and other healthcare professionals and workers in the community hospital setting. Findings revealed that multiple people in multiple professions and positions committed a variety of errors during the course of routine and emergent work that resulted in patient harm. Specific patterns of risk were identified for organizational leaders to examine and address strategically with the goal of improving the reliability of practitioners, teams, and patient care delivery systems.

Nurse executives could also partner with their SBONs and begin the analysis of reportable practice breakdown events using the TERCAP in the practice setting. Information surrounding an error is generally more accurate immediately following an event, and, as time goes on, the information has a tendency to decay. Therefore, a richer database is potentially available for SBONs and practice settings when they work in partnership.

SBONs using this instrument will have the opportunity to compare their patterns of error with those of other states. They will also have the possibility of conducting prospective studies to determine whether specific state board educational interventions reduce certain classes of errors for nurses who have been reported. The instrument will be useful for providing feedback to specific service provision institutions in order to assist them in reducing nurs-

ing errors. TERCAP instrument survey reports should be useful to schools of nursing in designing educational programs and curricula to better prepare nursing students for safer patient care environments, as well as identifying best practices related to evidence based regulation. A TERCAP database will be useful in tracking repeated problems with a particular nurse's misconduct or errors across multiple states. Finally, a collaborative partnership with nurses, regulators, educators, facility leadership, stakeholders, and other policy leaders will enhance the efforts of this evidence-based regulatory performance measurement to provide evidence for effective health care policy and public protection. 

References

1. Kohn, L. T., Corrigan, J.M. & Donaldson, M.S. (Eds.) (1999). IOM: To err is human: Building a safer health system. Washington, DC: National Academy Press.
2. Wachter, RM, Shojania, KG (2004) The patient safety movement will help, not harm, quality. Ann Intern Med. 2004 Aug 17;141(4):326-7.
3. Institute of Medicine, Committee on Quality of Health Care in America (2001). Crossing the quality chasm: A new health system for the 21st century. Washington DC: National Academy Press.
4. Institute of Medicine, Committee on Quality of Health Care in America (2004). Keeping patients safe: Transforming the work environment of nurses. Washing DC: National Academy Press.
5. McGlynn, E. A., Asch, S.M. Adams, J., Keesey, J, Hicks, J. DeCristofaro, A.& Kerr, E.A. (2003). The quality of health care delivered to adults in the United States. NEJM. 348:26;2635-2645.
6. Bates, DW, Spell, N, Cullen, DJ et al. (1995) "The costs of adverse drug events in hospitalized patients, Journal of the American Medical Association. 277(4); 307-311 .
7. Chassin, MR (1997) Assessing strategies for quality improvement. Health Aff (Millwood). May-Jun;16(3):151-61.
8. Institute of Medicine 2003 Patient Safety: Achieving a new standard for patient care. Washington D.C. IOM July 20.
9. Merry, M. & Brown, J. (2001/2002, Winter). From a culture of safety to a culture of excellence: Quality science, human factors, and the future of healthcare quality. Journal of Innovative Management, 7(2),29-46.
10. Center for Disease Control, National Center for Health Statistics: Preliminary data for 1998, 1999.
11. DePalma, J. A. (2002). Proposing an evidence-based policy process. Nursing. Administration Quarterly, 26, 55-61.
12. Cooper, S., Betts, V.T., Butler, K. & Gentry, J. (2005). In Malloch, K & Porter-O'Grady, An introduction to Evidence-Based Nursing Practice. Sudbury,MA: Jones & Bartlett.
13. Gray, J. A. Muir, (2001). Evidence-based health care: How to make health policy and management decisions. London: Churchill Livingstone.
14. Benner, P., Sheets, V., Uris, P., Malloch, K., Schwed, K. & Jamison, D. (2002) Individual, practice and system causes of error in nursing. JONA. 32 (10); 509-523.
15. Leape, L. (1994) Error in medicine. JAMA. 272(23),1851-57.
16. Dunne, J. (1993) Back to the rough ground: Practical reasoning and the lure of technique. Notre Dame, 'IN: University of Notre Dame Press
17. Aristotle (1953 Nicomachean ethics (J.K. Thomson, Trans.) As The ethics of Aristotle. New York: Penguin.
18. MacIntrye, A. (1984.) After Virtue. 2nd Ed. Notre Dame, IN: University of Notre Dame Press.
19. Benner, P, Tanner C. A. & Chesla, C.A. (1996) From Beginner to Expert: Caring, Clinical Judgment and Ethics. New York, NY: Springer
20. Bowker, G.C. & Starr, S. L. (1999). Sorting things out: Classifications and it consequences. Cambridge, MA: The MIT Press.
21. Speelman, J. (2001, Fall). JCAHO summary of the sentinel events standard requirements. HealthBeat, 1(1), 1-7.
22. Scott, K. (2004). Errors and failures in complex health-care systems: Individual, team, system and cultural contributors. Unpublished dissertation: The Union Institute & University, Cincinnati, OH.
23. Emrich, L. (2004). The incidence of nursing non-vigilance and diminished nursing vigilance in selected cases investigated by the Ohio Board of Nursing. Unpublished master's thesis, Capital University, Columbus, Ohio.
24. Benner, P., Hooper-Kyriakidis, P. & Stannard, D. (1999). Clinical wisdom and interventions in critical care: A thinking in action approach. Philadelphia: Saunders.
25. Husch, M, Groszek, J., Rooney, D., High Alert Medications and Safe Practices, A Study Guide for Nurses. Marblehead: MA: HCPro.Inc.
26. Fairman, J. (1992). Watchful vigilance: Nursing care, technology, and the development of intensive care units. Nursing Research, 41(1), 56-60.
27. Cooper, S., Betts, V.T., Butler, K. & Gentry, J. (2005). In Malloch, K & Porter-O'Grady, An introduction to Evidence-Based Nursing Practice. Sudbury,MA: Jones & Bartlett.
28. Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002).
29. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. Journal of the American Medical Association, 288(16), 1987-1993.
29. Needleman, J., Buerhaus, P., Mattke, S., Stewart, M. & Zelevinsky, K. (2002). Nurse-staffing levels and the quality of care in hospitals. New England Journal of Medicine, 346(22); 1715-1722.
30. Papadakis, MA, Hodgson, CS, Teherani, A, Kohatsu, N.D. "Unprofessional behavior in Medical School is associated with subsequent disciplinary action by a state medical board. Academic Medicine 79 (3) March, 244-249.
31. ABIM Foundation, ACP-ASIM Foundation, and European Federation of Internal Medicine. Medical professionalism in the new millennium: a physician charter. Ann Internal Med. 2002;136:243-6
32. JCAHO, (2002) Healthcare at the crossroads: Strategies for addressingthe evolving nursing crisis. JCAHO.
33. Roberts, K 1990) Managing high reliability organizations. California Management Review Summer: 101-113.
34. Roberts, K , Bea, R (2001) When systems fail. Organizational Dynamics 29(3) 179-191.