Essential Concepts for Staff Nurses:  
*The Outcomes Imperative*

*Denise M. Korniewicz DNSc., RN, FAAN  
and  
**Joanne Duffy DNSc., RN, CCRN*
Abstract

This module is designed to help staff nurses begin to pursue more knowledge about the outcomes movement. The historical foundation of quality improvement in healthcare, definitions of quality and models of quality are presented. The science of measuring nursing outcomes is reviewed including risk adjustment and risk stratification. Recent research related to evidence-based practice and patient safety is included. Specific outcome indicators and their importance to healthcare are discussed. Additional links to websites are identified for use as a guide for additional references.

Objectives

At the end of this article, the nurse will be able to:

1. Describe the outcomes imperative.
2. Define quality nursing.
3. Differentiate the different models of quality.
4. Explain risk adjustment and risk stratification.
5. Evaluate clinical indicators research associated with evidence-based practice.

Introduction

The changes in the delivery of health care services have shifted from a process oriented system to an outcomes and performance based system. These changes have been endorsed by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), the National Committee on Quality Assurance (NCQA) and the Center for Medicare and Medicaid Services.
(CMS) as ways to measure quality health care. Increased consumer awareness, cost of health care and increased health care competition has resulted in the need for all health professionals to define, quantify, and objectively evaluate how their work influences a patient’s health status. Moreover, the need to determine work practices, numbers of health care providers available and policies associated with quality patient care continue to be of concern. Now more than ever before, nurses need to document how nursing care influences their patients’ health status, quality of life, health knowledge and ability to continue activities that maintain their independence.

Factors that have fueled the new science of outcome measurement have included the diversity of medical treatment from one region to another, the frequency of surgical procedures and the competency of health care providers. Consumers have questioned the variety of care available, the inconsistency in which it is delivered and its impact on safety. One response to the consumer’s concerns about the delivery of health care services has been a trend to determine the most appropriate and cost-effective treatment available. To date, much of the data available includes monitoring patient outcomes based on the medical model of care and treatment strategies consistent with effective medical care. The effects of many nursing interventions have not been studied and often nursing interventions have not been quantified or linked to patient outcomes.
**Historical Overview**

Historically, Florence Nightingale was the first nurse to measure nursing outcomes by simply documenting that wherever nurses were, far fewer patients died, and wherever they were not, far more died. In fact, the first database in nursing outcomes was demonstrated by Nightingale in 1854 when she illustrated that hospital death rates were reduced from 42% to 2.2% within six months when nursing interventions (cleanliness, wound dressing changes, bathing) were performed.

In 1910, a group of British surgeons formed the American Colleges of Surgeons and collected national data related to surgical mortality. Eventually, this group established the Joint Commission for Accreditation of Hospitals (JCAH) and described quality of health care as the absence of defects. JCAHO, as it is now called, became known as the official accreditation body that defined a minimum standard for patient care while mandating hospitals to comply. During the sixties (1960-1970) quality was related to good care and measured subjectively by what patients reported as a result of medical care provided. However, during the seventies, healthcare providers were held accountable for a variety of structure and process standards such as numbers of environmental hazards, amount of care that nurses provided and documentation of patient nurse ratios, as well as general patient statistics related to mortality and morbidity. It was not until the mid-eighties, when the Health Care Financing Administration (HCFA) (now CMS) began to release mortality data on Medicare patients that quality was associated with the cost of healthcare. However, evaluation of effective health care continued to be linked with structure and process standards versus patient care outcome indicators.
During the nineties JCAHO expanded its mission which became known as the health care agenda for change and required reporting of healthcare outcome indicators such as infection control rates, surgical outcome data and medical treatment options that related to the overall health status of patients. Today, these outcome indicators are correlated with the number of readmission rates and adverse events resulting from hospitalization and their impact on the overall cost of hospital care. Research related to patient care outcomes continues to be evaluated and correlated with access to healthcare, type of care rendered (medical versus surgical), provider (traditional versus alternative approach), and number of services needed (nursing, occupational or physical therapy, social work). Therefore, measuring the quality of healthcare continues to be redefined and expanded to include patient care outcome indicators that can be easily defined and readily computed.

**Defining Quality in Nursing Care**

Although quality health care is associated with the absence of negative outcomes in patients, quality itself cannot always be assured. However, methods to assess or improve patient care can be measured. Although many health care institutions have embraced quality improvement models to provide effective care, few have developed nursing specific quality measures that encompass how nursing care can influence the overall health outcomes of the patient. Recently, the nursing profession has been pressured to demonstrate its contributions to patient outcomes and to provide evidence of nursing sensitive indicators that directly or indirectly measure the quality of nursing care.

Nursing outcomes may be considered the end product of care: the direct result of a nursing action or intervention. Nursing is increasingly concerned with assisting patients to define and achieve the end product for themselves. For nursing outcomes to be relevant and meaningful, the patient’s perspective and participation have to be central features. Quality of nursing care may be influenced by the nurse-patient relationship, the patient’s active participation in decisions about their care and public awareness of nursing care. Other factors that can link quality of nursing care may be associated with the nurse’s role, such as patient advocate, mediator, guide, or coordinator of care.
Most nursing interventions for conditions such as pain, symptom management, self-care, or activities of daily living can generate specific nursing outcomes that enumerate patients’ responses to their care. For example, data generated from staff nurses caring for patients with pain would include a patient’s self-reported pain level or score, percent of body affected and length of the pain episodes. The quality of nursing care would be correlated with the patient’s response to symptom control and resolution of the problem. Therefore, nursing care no longer is processed based (documenting that the pain medication was given), but rather it is based on nursing outcome data that is evidenced by patient response to the nursing action.

Models to evaluate quality. The evaluation and management of quality healthcare has shifted from structures and processes to outcomes. One of the first models to evaluate healthcare quality was developed by Donabedian and included the elements of: structure, process and outcomes (figure 1). Lohr defined outcomes as the 5D’s: death, disease, disability, discomfort, and dissatisfaction. What these initial models lacked was the role of nursing and how nurses influenced patient care. Irvine developed the nursing role effectiveness model, which encompassed Donabedian’s work (structure, process, outcome) and emphasized the individual nurse, the healthcare organization, patient centered outcomes or how nursing actions influenced the patient.

Duffy’s “Quality – Caring Model” incorporates aspects of Donabedian, Irvine, and Watson’s work with special emphasis on nursing’s unique role for improving patient outcomes (Figures 2). During the decade of the nineties, various nursing interventions, health care systems, and outcomes management approaches were adopted as methods for which healthcare was delivered. Little research, however, has demonstrated evidence of their effectiveness. Recently, more positive approaches to measuring health care outcomes, such as functional status or quality of life, have been used to evaluate a patient’s improvement. The ability to evaluate the quality of care has shifted from structures (having the right things) to processes (doing the right things) to outcomes (having the right things happen). One result of this effort has been the development of the American Nurses Association (ANA) National Database for Nursing Quality Indicators (NDNQI). These acute care quality indicators include specific measures to obtain data about
nosocomial infection rates, patient injury rates, nursing care, pain management, pressure ulcers and patient satisfaction during hospitalization. Additional community quality indicators have been developed to include smoking cessation, therapeutic alliances and functional status.  

The Science of Outcomes Measurement

Currently, the practice of healthcare remains wrought with variation and continuous change. Changes in health policy related to reimbursement, organizational and structural change and nursing manpower issues impact on the way data are collected, summarized, and reported. Neither structure nor process variables have shown consistent relationships to patient outcomes when examined alone. During the last fifteen years, health service researchers have demonstrated that quality can be measured. However, without accounting for patient characteristics that influence outcomes of interest, the results are not considered credible. Therefore, the new science of outcomes measurement requires nursing sensitive measures, appropriate risk adjustment for nursing quality indicators, data collection methods that are accurate and readily available, and data sets that are easily suitable for the healthcare organization.  

Two examples noted in the literature have been age and its association with the number of patient falls, and gender and its association with coronary artery disease. Other variables that may influence measuring health outcomes include genetics, demographic characteristics (race, socioeconomic status, marital status, religion, health beliefs), co-morbid conditions, and overall health status prior to an illness episode. These are important variables that need to be considered when analyzing risk categories for a given patient population.  

Risk adjustment. The term risk adjustment simply refers to comparing like things for a defined patient population. It can also be defined as the probability of a selected outcome while controlling for a predetermined set of risk factors. Risk factors, such as demographics, medical diagnosis, and scores related to the severity of a patient's illness or to physiological variables within a given patient population are examples of risk adjustment variables. Typically, these variables are correlated with the outcome indicator of interest in a sophisticated regression model that demonstrates how much variance is explained by the set of risk factors. Many such models
have been published in the medical literature and are used in ongoing research. There are a variety of outcome data-based software programs that are risk adjusted and used within the health care system that classify patient populations and predict mortality, morbidity, length of stay and costs. One example of a risk adjustment database used to determine medical cost is the International Classification of Disease (ICD) codes\textsuperscript{22}, which are not costly and can be readily abstracted from hospital data records. A more clinically relevant medical risk adjustment model would be the Acute Physiological and Chronic Health Evaluation (APACHE)\textsuperscript{23} system that records data based on the physiological indicators of a patient’s response to medical care. Lastly, the Computerized Severity Index (CSI)\textsuperscript{24} AND the Medis Groups\textsuperscript{25} are risk adjustment models that classify patients according to their overall need for medical care.

Although risk adjustment models for medical care are available, little if any of the models incorporate the effectiveness of nursing care. For example, none of the risk adjustment models include data about how nursing interventions impact on medical treatment or how nurses intervene to enhance patient care. Other variables such as physical functional status, psychosocial factors, culture and co-morbid factors should be considered when risk adjusting and when determining overall patient outcomes. The role of pre-determined risk factors such as age, gender and cognitive functioning needs to be considered since these factors contribute to the overall health of a population and may affect the predicted outcome of a patient. However, many of the risk adjustment models that are used in health care systems today are concerned with selected demographics, medical diagnosis and physiological variables versus variables that may predict quality and effectiveness of nursing care.

**Risk stratification.** The term risk stratification refers to grouping patient outcomes indicators according to the factors that are known to influence the risk of a given population. Since nursing-sensitive risk adjustment models are limited, one way to report nursing sensitive outcomes with some credibility is to group them according to risk categories. For example, pressure ulcer data could be grouped according to age categories, while nosocomial infection rates could be grouped according to diagnoses or treatment settings. Such categorization provides a means of representing outcomes data that takes pertinent risk factors into consideration.
Attempts to assess outcomes of patient care associated with nursing activities among high risk patient populations have not been clearly evaluated, nor are there measurable data to demonstrate the effect of the role of the nurse on patients. Evidence-based practice linkages between the role of nurses, their actions with the patient and documentation related to patient response must be provided to determine the impact nursing has on the overall health status of a patient population. Therefore, risk adjustment models and risk stratification techniques need to address not only medical care results, but also nursing interventions that assist in the overall treatment plan for a patient population.

Evidence-Based Practice and Patient Safety

The way nurses work together with other members of the health care team may indirectly influence patient care. Sherwood 26 found that how health care teams (nurses, physicians and other technical support members) worked together, communicated and organized their work environment influenced patient safety outcomes related to medication errors and patient injuries. Aiken, Clarke, Sloane, Sochalski et al. 27 noted that when hospital administrators provided training, quality assurance programs, and continuing education programs, nurses were less likely to injure patients and provided safer comprehensive care. Therefore, the work environment, as well as the ability of the health care team to effectively work together, indirectly impacts on the safety of patients.

Most recently, Aiken 27 demonstrated that poor nurse staffing based on the number of nurses available to provide patient care, was directly linked to patient mortality. Furthermore, Needleman, Buerhaus, Mattke, Stewart et al. 28 have shown that when nurses have more patients to care for, the patients experience more adverse medical complications such as urinary tract infections, pneumonia, shock, and increased gastrointestinal bleeding resulting in increased hospital stays. The medical complications cited can be directly linked to nursing actions and interventions associated with the prevention of patient complications. This example demonstrates the use of clinical data by linking the data to nursing functions associated with evidence based nursing practice. Using quality indicators will help clinical practice nurses continue to measure the actions associated with quality nursing care and directly impact on the patient’s safety.
It is important to assure that there is an ongoing monitoring system to track core patient indicators which is based on identified patient outcomes within an institution. Nursing care can be directly or indirectly measured when data are routinely collected and made available to staff. It is important to provide feedback to all nursing staff, so that quality patient care can be monitored, improved and safely provided. Other examples of initiatives associated with evidence-based practice models that effect the overall safety of patients include: monitoring of vital signs for early detection of sepsis; prevention of self-extubation; use of pre-connected urinary catheters to decrease urinary tract infections; prevention of deep vein thrombosis by monitoring ambulation; and providing time for institutional quality improvement teams to meet.

**Defining & Measuring Nursing Outcomes**

The purpose of outcomes research is to evaluate: the quality of care for health conditions and diagnoses of enrolled populations and the performance of health plans in meeting patient needs while determining accountability. McCormick has defined health outcomes within three domains: 1) effective clinical interventions used to prevent, diagnose, treat and manage clinical conditions; 2) methods and data to advance the clinical application of outcomes; and 3) evaluation of the impact of clinical outcomes on patient populations. The use of clinical practice guidelines grounded in research, in addition to the use of appropriate diagnostic treatment regimens can improve the quality of patient care without increasing the cost of care.

Measuring nursing outcomes to determine if nursing care makes a difference (what the nurse does for the patient, with predicted health outcomes that result from specified nursing interventions) requires a new set of clinical skills. Nurses need to demonstrate the value of nursing care in terms of improved outcomes linked to nursing activities and interventions by evaluating the rate of improvement in a patient’s health status (functional status/self-care, psychological adjustment and involvement with managing their health) within the health care system. Examples of nursing sensitive outcome measures as defined by the ANA for acute care settings include: nosocomial infection rates; patient injury rates from falls; patient satisfaction with nursing care; pain management; educational information; nursing job satisfaction;
maintenance of skin integrity; and staff mix (RNs, LPNs, technicians). These nursing quality indicators are defined in operational terms to specifically measure nursing actions (Table 1).

Much work needs to be done to adequately address the contributions of nursing care on the overall status of patient outcomes. Currently, the science of nursing outcomes has progressed from structure and process models to outcomes-based models. Specifically, nursing needs to: 1) establish the difference nurses make in patient care versus other health professionals, 2) provide data related to specific interventions such as pain control, patient safety, or decrease in adverse events (wound care, decubitus ulcers), and 3) determine nursing’s impact on the continuum of care or management of a defined patient population. Outcomes based on the results of nursing care will increase professional accountability, decrease adverse patient events, provide changes related to nursing interventions and, over time, revamp the practice of healthcare. The ANA’s Code for Nurses and Interpretative Statements actually benefits patients and families and is considered the hallmark of current professional nursing practice. Therefore, it is important for staff nurses and consumers of health care to be aware of the trends associated with evidence-based clinical outcomes and become familiar with requirements mandated by accrediting agencies.
References


Figure 1. Donabedian’s Quality of Medical Care Model

<table>
<thead>
<tr>
<th>Structure</th>
<th>Process</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>System characteristics</td>
<td>Technical style</td>
<td>Clinical end points</td>
</tr>
<tr>
<td>Provider characteristics</td>
<td>Interpersonal style</td>
<td>Satisfaction with care</td>
</tr>
<tr>
<td>Patient characteristics</td>
<td>Functional status</td>
<td>General well-being</td>
</tr>
</tbody>
</table>

Figure 2. The Quality-Caring Model

Table 1. ANA Nursing Quality Indicators and their Operational Definitions *

Nosocomial Infection Rate: The rate per 1000 patient acute care days at which patients develop clinically active bacteremia (as defined by CDC) in whom there is no evidence to suggest that infection was present or incubating at admission (using CDC differential criteria).

Patient Injury Rate: The rate at which patients fall and incur physical injury (unrelated to a surgical or diagnostic procedure) during the course of their hospital stay per 1000 patient days.

Patient Satisfaction with Nursing Care: Patient opinion of care received from nursing staff during the hospital stay as determined by scaled responses to a uniform series of questions designed to elicit patient views regarding key elements of nursing care services.

Patient Satisfaction with Pain Management: Patient opinion of how well nursing staff managed their pain as determined by scaled responses to a uniform series of questions designed to elicit patient views regarding specific aspects of pain management.

Patient Satisfaction with Educational Information: Patient opinion of nursing staff efforts to educate them regarding their condition and care requirements as determined by scaled responses to a uniform series of questions designed to elicit patient views regarding specific aspects of patient education activities.

Patient Satisfaction with Care: Patient opinion of the care received during the hospital stay as determined by scaled responses to a uniform series of questions designed to elicit patient views regarding global aspects of care.

Nursing Job Satisfaction: Job satisfaction expressed by nurses working in hospital settings as determined by scaled responses to a uniform series of questions designed to elicit nursing staff attitudes toward specific aspects of their employment situation.

Maintenance of Skin Integrity: Rate per 1000 patient days at which patients develop pressure ulcers (Grade II or greater) during the course of their hospital stay, but, 72 hours or more following their admission.

Mix of RNs, LPNs, Unlicensed Staff Caring for Patients in Acute Care Settings: The ratios (expressed in FTEs) of registered nurses with direct patient care responsibilities to LPNs and unlicensed workers.

Total Nursing Care Hours Provided per Patient Day: Total number of hours worked by nursing staff with direct patient care responsibilities on acute care units per patient day.

List of useful websites for more information on Quality / Outcome Measures:

http://www.indmedica.com/hospad/hindex1.cfm?haid=73  (J Acad Hosp Adm article)

http://www.rand.org/cgi-bin/health/lookup.pl  (Rand health abstracts, bibliography)

http://www.ahqa.org/pub/media/159_678_3276.CFM  (American Health Quality Association website)

http://www.nih.gov/ninr/news-info/pubs/porcontents.htm  (Ninr website that has historical overview of papers presented related to patient outcomes research)

http://www.mriresearch.org/Markets/Health/Health_Serv/nursing.htm  (Midwest research institute gives information about the ANA National Database of Nursing Quality Indicators)