

Third Edition

Understanding the Essentials of
**CRITICAL CARE
NURSING**

Kathleen Quimet Perrin • Carrie Edgerly MacLeod



Understanding the Essentials of Critical Care Nursing

Third Edition

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Dedication

This book is dedicated to my husband, Robin. He insisted that I should write the first edition of this book, and he has continued to support me as I developed each subsequent edition.

It is also dedicated to critical care nurses, specifically to those critical care nurses whom I have seen develop from novice nurses into expert clinicians. It has been an absolute joy to watch former students as they evolved from fledgling nurses into expert practitioners, capable of caring for the very sickest of patients, educating future nurses, and advancing the profession of nursing. One of the most fulfilling experiences in my life has been watching my former students and seeing them develop into nurses far better than I could ever hope to be. I hope this book will serve as a foundation for nurses in the future as they make that transition.

—*Kathleen Ouimet Perrin PhD, RN, CCRN*

I would like to dedicate this book to my husband, David, and my daughters, Annie and Kate. Like most things in my life, I could not have taken this journey without the three of you and the support you give me every day. I also want to thank Kathleen Perrin for her guidance and mentoring over these many years. She inspired me as my professor and continues to do so as my friend. I would not be the nurse I am today if not for her. Lastly, I would like also to dedicate this book to my parents, James and Jean Edgerly, who are the reasons I became a nurse. Every time a nurse helps to save a life, I think of them. I am so proud of our profession and what we do as nurses each and every day.

—*Carrie Edgerly MacLeod PhD, APRN-BC*

Thank You

Our heartfelt thanks go out to our colleagues from schools of nursing across the country who have given their time generously to help us create this exciting new edition of our book. We have reaped

the benefit of your collective experience as nurses and teachers, and we have made many improvements due to your efforts. Among those who contributed to this edition are:

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Preface

This book is an introduction to critical care. It focuses on elements that are essential for the novice critical care nurse to understand—whether the novice is a student or a new graduate. When critical care nursing was introduced as a specialty more than 50 years ago, the focus of care was on patient observation and prevention of complications of the disease or treatment. Over the past 50 years, critical care has become curative care. Now, most patients have favorable outcomes, surviving to return home following complex treatments that often include life support. However, patient survival and well-being do not just depend on the development of new and ever more complex treatments. Rather, the presence of well-educated, expert nurses has been shown to have a significant impact on patient outcomes. This book focuses on the essentials for beginning critical care nurses so that they may deliver the safe, effective care that *optimizes* patients' outcomes.

We are fortunate that critical care practice has changed from the early years when health care providers learned as they went along, experimented with new interventions on their patients, and often relied on intuition to choose those interventions. Intuition could not be trusted as a basis for practice, and the experiences provided too small a sample to draw inferences. Whenever possible, this book relies on evidence-based recommendations for collaborative and nursing practice. It cites individual research studies, but more often cites meta-analyses and evidence-based practice recommendations made by respected professional organizations. When the foundation for practice is based on evidence, it is far more likely to be safe and effective.

Since the last edition of the text in 2013, much has changed in the provision of care to critically ill patients. Evidence supports significant changes in the provision of sedation and pain medication as well as the management of ventilation, heart failure, stroke, blood or volume resuscitation in trauma, palliative care and sepsis. All of these new recommendations for practice are incorporated in the third edition of this text.

Critical care nursing is an evolving specialty. *Understanding the Essentials of Critical Care Nursing* is intended to provide novice critical care nurses with a firm foundation so that they are able to understand the complexities of care, deliver safe, effective care, and begin their transition to expert critical care nurses.

Organization and Key Themes of This Book

The topics for these chapters were chosen after reviewing suggestions for foundational critical care content from a variety of nursing organizations, including the American Association of Critical Care Nurses and the National Council of State Boards of Nursing. The first chapter addresses what is unique about critical care and critical care nursing, including legal and ethical issues nurses encounter. The second chapter focuses on the needs and concerns that are common to critically ill patients or their families, and it explores ways nurses might meet those needs. The remaining chapters describe the essentials of providing care to patients with disorders that are commonly seen in critical care settings. There is no attempt to cover all possible content. Rather, the text concentrates on problems that the new critical care nurse is most likely to encounter. Because many patients die in critical care units, or shortly after being transferred out of critical care units, the final chapter discusses care of the dying patient.

A recurrent theme in this book is safe practice. As critical care has become more complex, the potential for error has increased. Chapter 1 includes a discussion of some of the reasons why errors are common in critical care units. Fortunately, there are documented ways in which nurses can prevent or limit health care errors. One of the most effective ways to prevent errors is to improve communication and collaboration among members of the health care team, as described in Chapter 1. In each subsequent chapter, a Safety Initiative feature describes specific recommendations by the Institute for Health Care Improvement and other national groups that, when implemented, can limit errors and enhance patient safety.

As we have gained expertise in critical care, we have learned that not all adult patients with a particular diagnosis are the same. Specifically, we have begun to realize that older and overweight adults have unique needs. With the increasing numbers of people in these cohorts, knowledge of how to care for them must be part of the foundation of critical care practice. We have included information on gerontological and bariatric patients as separate **Gerontologic Considerations** and **Bariatric Considerations** in each chapter.

In this text, **Nursing Actions** are a component of **Collaborative Management**. The content in the Nursing

Action sections emphasize nursing interventions required for safe, effective medical and surgical management of the patient—for example, what are the nursing actions when administering amiodarone, or what nursing assessments are essential after a patient has a cardiac catheterization. In contrast, the **Nursing Care** sections highlight interventions that focus on providing care to a patient and creating a healing environment. Nursing Care sections focus on promoting patient comfort, providing adequate nutrition, and assisting the patient and family to cope with the critical illness or impending death.

Nursing management of critical care patients includes using some of the latest technology developed for the health field. **Building Technology Skills** text sections focus on specific technology that the nurse is most likely to encounter when caring for patients experiencing the conditions discussed in the chapter, and the related skills required to use that technology.

A critically ill patient is a dynamic system of interrelated factors. In order to help visual learners understand the relationships between and among these factors, each chapter includes a least one **Visual Map** to illustrate the relationships among the disease states, collaborative interventions, and outcomes.

Commonly Used Medications, those that are most often prescribed for the conditions addressed in the chapter are highlighted in these boxes. For each medication, information is provided on dosing information, desired effects, nursing responsibilities, and potential side effects.

Safety is an essential focus in critical care settings. **Safety Initiative** boxes highlight specific issues related to the content in each chapter. Included are the purpose, the rationale, and highlighted recommendations.

In each chapter, a **Case Study** of a real-life patient scenario illustrates the chapter content and provides an example of collaborative and nursing management. Critical thinking questions allow the reader to solve the posed problems. The case studies continue on the Com-

panion Website, offering learners the opportunity to extend the textbook learning and submit responses to their instructors.

Critical Thinking Questions are also located at the end of the chapter; these are designed to help students develop a deeper understanding of the content and explore relationships among concepts discussed in the section.

Essentials identify evidence based practices, communication strategies, safety measures, or system based practices that the novice nurse must know to practice safely. The areas chosen to be highlighted as essentials are derived from the Robert Wood Johnson Nurse of the Future initiative. The goal of this feature is very similar to the overall goal of QSEN (Quality and Safety Education for Nurses), which is “to meet the challenge of preparing future and new nurses who will have the knowledge, skills and attitudes necessary to continuously improve the quality and safety of the healthcare system within which they work.”

Reflect On is a feature that promotes reflection and journaling on some of the difficult issues that nurses encounter in their practice. This feature was added to the second edition because reflection on the difficult issues and times in personal practice has been shown to facilitate a novice nurse’s progression to expert nurse.

In addition to the features that were retained from previous editions, a new feature added to this third edition.

Why/Why not? This feature asks students to critically analyze WHY they should be implementing a specific collaborative management strategy or nursing action for a patient and why it might NOT be appropriate to implement the strategy or action for that particular patient. The Why/Why not feature addresses questions concerning medications, therapies, diagnostic testing, patient and family interactions, collaborative communication, and more. The feature can be used for in class discussion or individual student journaling concerning the most appropriate collaborative management or nursing care to provide to critically ill patients in complex situations.

Acknowledgments

We appreciate the energy, time, and thought that the authors of all the chapters put into this edition, giving up weekends and holidays, and persisting despite personal and family difficulties. They brought their expertise in critical care nursing to each of their chapters and their knowledge is one of the foundations of this book.

We appreciate the hard work of the reviewers who made certain that all of our content was absolutely accurate and up to date. We also benefitted from suggestions from our students who used the previous editions of this book. Their thoughtful comments were the basis for revisions in this edition.

We could not have completed this task without the assistance and advice of our editors at Pearson who have remained with us from the previous editions. From the time Pamela Fuller developed the idea of this book, she has been incredibly supportive. Barbara Price has been our constant e-mail companion, keeping us on track, helping us understand the process of electronic publication, and easing all the chapter authors through the rough spots.

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Chapter 1

What Is Critical Care?

Kathleen Perrin, PhD, RN, CCRN

Abbreviations

AACN	American Association of Critical-Care Nurses	IHI	Institute for Healthcare Improvement
AHRQ	Agency for Healthcare Research and Quality	IOM	Institute of Medicine
ANA	American Nurses Association	QSEN	Quality and Safety Education for Nurses
ICU	Intensive Care Unit	SCCM	Society of Critical Care Medicine



Learning Outcomes

Upon completion of this chapter, the learner will be able to:

1. Analyze the key components of safe, effective care in the critical care environment.
2. Explain the essential attributes of the role of critical care nurse.
3. Examine the multidisciplinary nature of care within the critical care environment.
4. Explain the ethical and legal issues in critical care.
5. Differentiate among the major factors that affect the well-being of critical care nurses.

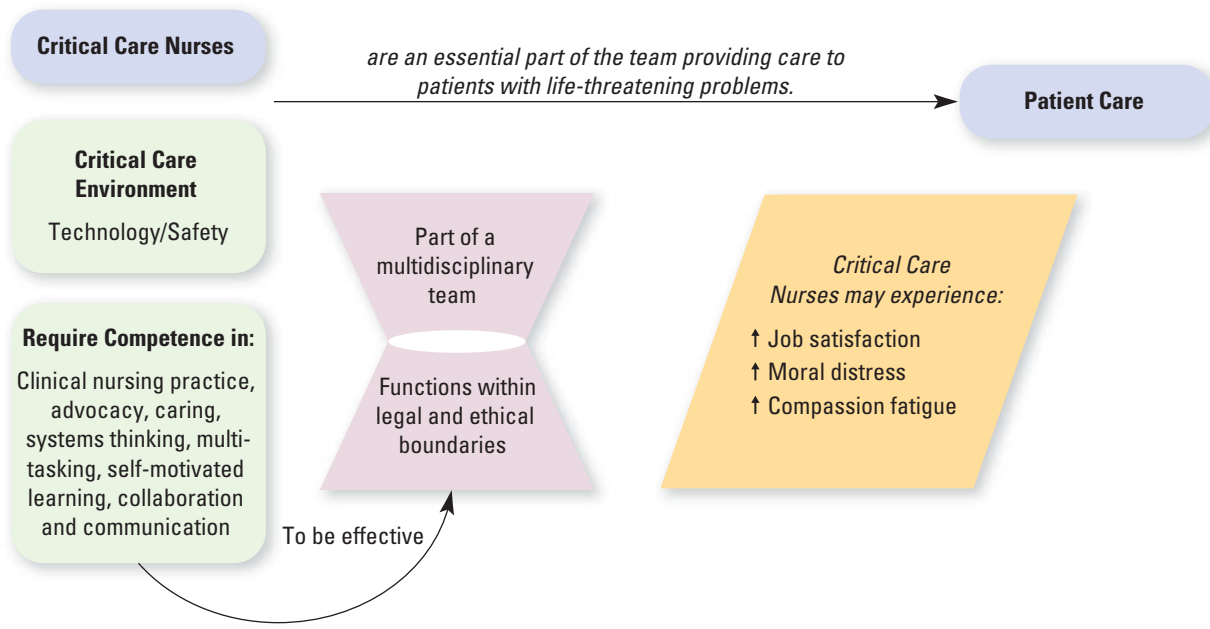
The Critical Care Environment

Critical care is defined by the Department of Health and Human Services (2008) as the direct delivery of medical care for a critically ill or injured patient. To be considered critical, an illness or injury must acutely impair one or more vital organ systems to such a degree that there is a high probability of life threatening deterioration. Critical care involves highly complex decision-making and is usually, but not always, provided in a critical care area such as a coronary care unit, an intensive care unit, or an emergency department. Visual Map 1-1 displays the role of the nurse and the multidisciplinary team in the delivery of critical care to a patient.

Trends in Critical Care Units

Although seriously ill patients had historically been grouped together and cared for by a designated nurse, usually near the nurses' station, they were not separated from other patients and placed in critical care units until the early 1950s. At that time, the use of mechanical ventilation and cardiopulmonary resuscitation began, and it became more efficient to provide care to gravely ill patients with specially trained nurses in one location in the hospital. By 1958, approximately 25% of community hospitals had an intensive care unit (ICU), and by the late 1960s, nearly every hospital in the United States had an ICU.

The number of critical care beds in hospitals has been increasing since 1985, and the number of noncritical care



Visual Map 1-1 Critical Care Overview

beds has been decreasing. These changes are a result of technological advances that have allowed critical care to become a cost-effective way to treat many patients. The use of noninvasive monitoring and targeted pharmacological therapy has resulted in fewer complications, and, therefore, the cost of caring for some critically ill patients has decreased. This has produced not only cost savings but shortened hospital stays as well, especially for patients with specific organ system failures such as severe sepsis and acute respiratory failure (Society of Critical Care Medicine [SCCM], n.d.).

According to the SCCM, there are currently nearly 6,000 ICUs across the United States with every acute care hospital having at least one ICU. However, there are many differences among the units that are called ICUs. Kirchhoff and Dahl (2006) determined that “unit findings often varied depending on the size of the unit, or size or location of the hospital the unit was in (e.g., urban, suburban, or rural hospitals)” (p. 18). In their study, the median number of beds in an ICU was 16, and the average number of admissions was about 2,000 per year. In most critical care units, the length of patient stay was between two and five days.

Critical care units need to differ because not all hospitals are intended to meet the needs of all types of patients and severity of illness. In 2003, the SCCM endorsed guidelines for critical care services based on three levels of care (Haupt et al., 2003). These guidelines suggested that each hospital provide a level of care appropriate to its mission and the regional needs for critical care services. The recommended levels of care are:

- **Level I:** Comprehensive care for a wide variety of disorders. Sophisticated equipment, specialized nurses, and physicians with specialized preparation (intensivists) are continuously available. Comprehensive support services from pharmacy, nutrition, respiratory, pastoral care, and social work are nearby. Most of these units are located in teaching hospitals.
- **Level II:** Comprehensive critical care for most disorders but the unit may not be able to care for specific types of patients (e.g., cardiothoracic surgical patients). Transfer arrangements to Level I facilities must be in place for patients with the specific disorders for which the unit does not provide care.
- **Level III:** Initial stabilization of critically ill patients provided but limited ability to provide comprehensive critical care. A limited number of patients who require routine care may remain in the facility, but written policies should be in place determining which patients require transfer and where they ought to be transferred.

Critical care units also differ in whether they are open or closed. In an open ICU, nurses, pharmacists, and respiratory therapists are ICU-based, but the physicians directing patient care may have other obligations. These physicians may or may not choose to consult an intensivist to assist with the management of their ICU patients. In a **closed ICU**, patient care is provided by a dedicated ICU team that includes a critical care physician. The Leapfrog Group (2014) recommends that ICUs should be closed units because mortality rates are 40% and morbidity rates

are 30% lower in closed ICUs. If all ICUs were closed, 55,000 deaths could be prevented each year. Unfortunately, there are not a sufficient number of intensivists to ensure that every ICU in the country can be closed, and only about 30% of ICUs meet Leapfrog's standards. In a report to Congress, the Department of Health and Human Resources (n.d.) stated that vulnerable populations, especially the uninsured and those living in rural areas, receive less than optimal care because smaller hospitals are unable to have intensivists consistently available.

Characteristics of the Critical Care Environment

Clearly, the specific nature of the critical care unit and the type of care delivered vary depending on the size and level of the unit. However, over the past 15 years across the level and size of critical care units, there have been more patients receiving care. In addition, those patients have been more acutely ill. Moreno, Rhodes, and Donchin (2009) state that there is a current pandemic of critical illness in part because the population is older and sicker. It is anticipated that the demand for critical care services will continue to grow over the next 20 years as the baby boom generation ages because Americans over the age of 65 utilize the majority of ICU services.

There are other commonalities among ICUs. The SCCM (n.d.) states that critical care is provided by multi-professional teams of highly experienced and professional physicians, nurses, and others. These healthcare professionals use their expertise to interpret information and provide care utilizing technologically advanced equipment that leads to the best outcomes for their patients. The qualities of specialized nursing are discussed later in this chapter, but some of the issues associated with specialized equipment and intensified, comprehensive care are discussed next.

Critically ill patients require complex, carefully coordinated care. When a care pattern is complex, failure in one part of the system can unexpectedly affect another. In addition, the care provided to critically ill patients is often coupled, meaning there is little or no buffer between events. Thus, if anything goes wrong, everything can unravel quickly. In addition, when things are tightly coupled, even when an error is identified, it can be difficult to prevent the situation from deteriorating. In part, this is because of the complexity and high degree of coupling of care in critical care areas, specifically emergency departments (EDs), ICUs, and operating rooms (ORs), where healthcare errors most commonly occur.

However, not only do the critically ill patients receive highly complex care, but the care they receive is also highly technological. In a foundational study, Leape and Brennan (1991) found that 44% of healthcare errors were

related to technology, and that all errors were more likely to occur in technologically advanced fields such as vascular, cardiac, and neurosurgery. The Institute of Medicine (Kohn, Corrigan, & Donaldson, 2000) postulates that technology increases errors for several reasons, including the following:

- Technology changes the tasks people do by shifting the workload and eliminating human decision-making.
- Although technology may decrease human workload during nonpeak hours, it often increases the workload during peak hours or when the system fails or is inadequate (e.g., when medication-scanning devices fail without warning and nurses are required to utilize paper systems to dispense medications then must back-track and re-document when the scanner is working).
- When the system becomes opaque, users no longer know how to perform a function without it (e.g., when intravenous [IV] pumps are constantly used to calculate doses of continuous medication infusions, nurses can no longer calculate the rate to infuse a drug at a specific dose of mcg/kg/min by hand). Therefore, errors may occur when the system fails.
- When devices are not standardized and demand precision to use (e.g., an ICU uses multiple brands of IV pumps or ventilators), problems can result.

Sandelowski (1997) expressed concern about how nurses interact with technology, believing that when nurses focus on interpreting machine-generated texts (such as rhythms on an electrocardiogram [ECG] monitor), they may fail to touch patients enough or in the right way. She warned that technology could change the way nurses obtain information from patients and the information they obtain. Thus, the use of technology, although essential to the delivery of critical care, can also predispose to errors in the delivery of care.

After reviewing the Institute of Medicine (IOM) concerns about patient safety in all healthcare environments, the Robert Wood Johnson Foundation established and funded the Quality and Safety Education for Nurses (QSEN) project in 2005. QSEN targeted six competencies for improving the quality and safety of healthcare systems and nursing practice. The competencies include patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics. This text focuses on describing the ways to deliver the safest, most effective collaborative care for specific patients according to the most recent evidence.

Safety

The safety of all patients is a concern. However, safety for vulnerable, unstable patients receiving critical care is

paramount. Mattox (2010) confirmed that the most vulnerable of unstable ICU patients are at highest risk for medical error (e.g., patients in isolation, patients with limited English proficiency or health literacy, and patients at end of life). Valentin et al. (2006) examined errors that occurred in 205 ICUs worldwide during one 24-hour period. Only about a quarter of the ICUs reported no errors. The remaining units reported the following types of errors:

- Dislodgment of lines, catheters, and drains
- Medication errors (such as wrong dose, wrong drug, or wrong route)
- Failure of infusion devices
- Failure or dysfunction of a ventilator
- Unplanned extubation while ventilator alarms were turned off

From these data, Valentin et al. (2006) concluded, “Sentinel events related to medication, indwelling lines, airway, and equipment failure in ICUs occur with considerable frequency. Although patient safety is recognized as a serious issue in many ICUs, there is an urgent need for development and implementation of strategies for prevention and early detection of errors” (p. 1591).

This concern about the frequency of errors and the need to develop preventive strategies is also apparent in a study by Garrouste-Orgeas et al. (2010), who measured the incidence and rates of **adverse events** in critical care. Twenty-six percent of the patients they followed experienced at least one adverse event. Garrouste-Orgeas et al. (2010) concluded that serious errors were common in critical care settings and translated to a rate of 2.1/1,000 patient days. These preventable errors were often associated with a combination of human factors and system-wide problems that caused errors or near misses (Garrouste-Orgeas et al., 2012). They concluded that it is important to find ways to develop work conditions (systems) that engineer out slips and lapses so that treatment is delivered as intended. In a system-based approach, the focus is not on who committed the error but rather determination of how the error occurred.

Since the release of the Institute of Medicine’s (IOM) report, *To Err Is Human* (Kohn et al., 2000), there has been a focus on uncovering system-wide problems and diminishing the potential for errors in hospitals in the United States. To decrease the potential for errors, the report recommends the following:

- **Utilizing constraints:** An example of a constraint is when the height, weight, and allergies of the patient must be on file to obtain medication for the patient.
- **Installing forcing functions or system-level firewalls:** An example of a forcing function is that concentrated

(undiluted) potassium chloride (KCl) is no longer available on hospital units.

- **Avoiding reliance on vigilance:** Because humans cannot remain vigilant for a protracted amount of time, checklists, protocols, and rechecking with another professional should be required before major procedures and before potentially dangerous medication administration. Examples are timeouts before surgery or double-checking doses on intensive insulin protocols.
- **Simplifying key processes.**
- **Standardizing key processes.**

Essential for Safety

To limit errors, critical care nurses need to consistently utilize existing checklists and standardized procedures rather than rely on memory.

Landrigan et al. (2010) undertook a study to determine whether the effort to reduce errors following publication of the IOM report had translated into significant improvements in the safety of patients. Unfortunately, despite studying institutions that had shown a high level of engagement in efforts to improve patient safety, they found that “harms remained common with little evidence of widespread improvement” (p. 2124). Most chapters of this text include safety initiatives that have been shown to enhance the safe care of patients when correctly and consistently implemented.

Reflect On

What might explain why Landrigan found so little improvement in patient safety?

There are documented ways in which healthcare providers can enhance safe, effective care and limit risks to critically ill patients. These include developing a multidisciplinary approach to patient care, encouraging a culture of safety, providing adequate staffing, and limiting work hours.

Multidisciplinary Approach to Care

Since the 1986 study by Knaus, Draper, Wagner, and Zimmerman, it has been apparent that when members of various disciplines collaborate in the care of critically ill patients, the patients have better outcomes. Evidence suggests that care should be delivered by a multidisciplinary team headed by a full-time critical care-trained physician and consisting of at least an ICU nurse, a respiratory therapist, and a pharmacist (Kim, Barnato, Angus, Fleisher,

& Kahn, 2010). Daily rounding by such a multidisciplinary team has been associated with fewer adverse drug effects, reduced duration of mechanical ventilation, and shorter ICU stay. Strategies that encourage teamwork and communication among staff members caring for critically ill patients can further improve patient outcomes (Whelan, Burchill, & Tilin, 2003).

Instituting a Culture of Safety

Benner (2001) recommends building a moral community and a culture of safety among team members. She defines a culture of safety as the “practice responsibility of all health-care team members working together in the moment to provide good healthcare” (p. 282). Sammer, Lykens, Singh, Mains, and Lackan (2010) considered how healthcare leaders might be able to determine if a “culture of safety” exists within their institutions. They determined that there were seven essential properties of a culture of safety. These included many of the elements that QSEN emphasizes: teamwork, evidenced-based practice, communication, and patient-centered care as well as a few additional elements—leadership, learning, and justice.

In a critical care unit that has embraced a culture of safety, practitioners have a responsibility to their patients to make their errors known, have them corrected, and share them with the patient, the patient’s family, and other practitioners. This sharing of information benefits the patient but ultimately benefits team members and future patients as well. When providers realize that multiple factors contribute to errors in the complex ICU environment, the focus shifts from one of “shame and blame” for errors to one of practice improvement. With practice improvement as the goal rather than punishment of the healthcare provider who committed the error, the reporting of errors results in the examination of the factors that contributed to the error and changes in practice patterns.

Henneman (2007) described a series of errors that occurred one day while she was caring for two critically ill patients. She noted that only one of the errors was a medication-dispensing error; it was the only error that was easy to identify and was reported in the traditional pattern. The remainder of the errors resulted from failures of communication or collaboration and breakdowns in the system. These errors were equally harmful to the patient as the medication-dispensing error, yet they were not readily identified as errors and were not reported. She believes that she did not report them because “I had become so accustomed to the system failures that I stopped recognizing them as such” (p. 33). If a culture of safety had been established, the breakdowns in communication and collaboration might have been identified as errors and reported. When a culture of safety is established, Henneman believes

that nurses will no longer have to “work around” system failures, and patient safety will not be jeopardized. A study by Huang et al. (2010) supports her view, finding that decreases in perception of the safety climate by ICU personnel were associated with poorer patient outcomes.

Ensuring Adequate Staffing Even the best teamwork and most competent staff will not consistently overcome inadequate staffing. Tarnow-Mordi, Hau, Warden, and Shearer (2000) demonstrated that “patients exposed to high ICU workload were more likely to die than those exposed to lower ICU workload” (p. 188). The three measures of ICU workload most closely tied to mortality in their study were peak occupancy of the ICU, average nursing requirement/occupied bed per shift, and the ratio of occupied to appropriately staffed beds. This study remains significant because it is the only published study that has related total nursing requirement, not just nurse/patient ratio, to patient outcome (Kiekkas et al., 2008). The American Association of Critical-Care Nurses (AACN) agrees that adequate staffing should not be defined as a specific nurse/patient ratio. In its report, *Standards for Establishing and Sustaining Healthy Work Environments: A Journey to Excellence* (2005), the AACN states that the basis for effective staffing is the realization that the needs of critically ill patients fluctuate repeatedly throughout their illness. Instead of mandating a fixed nurse/patient ratio, the AACN recommends instituting the following measures to ensure adequate staffing:

- The healthcare organization should have staffing policies grounded in ethical principles and support the obligation of nurses to provide quality care.
- Nurses ought to participate in all phases of the staffing process, from education to planning to assigning nurses with the appropriate competencies, to meet the needs of the patients.
- The healthcare organization should develop a plan to evaluate the effectiveness of staffing decisions and to use the data to develop more effective staffing models.
- The healthcare organization should provide support and technological services that increase the effectiveness of nursing care delivery and allow nurses to spend their time meeting the needs of the patients and those of the patients’ families.

Limiting Hours of Work The IOM recommended that nurses work no more than 60 hours each week or 12 hours in a 24-hour period (Page, 2004). In 2006, Scott, Rogers, Hwang, and Shang determined that when critical care nurses worked longer than 12 hours, the likelihood of errors and near errors increased and the nurses’ vigilance decreased. Unfortunately, in their study of 502 nurses, only

one critical care nurse left work on time every day. Most nurses rarely left work on time, even those who were working 12-hour shifts. These extended work hours increased the nurses' potential for errors. In addition, Scott et al. found that two-thirds of the nurses struggled to stay awake at least once during the 28-day study period and that 20% fell asleep. Allen et al. (2014) determined that this pattern of sleepiness and sleep deprivation was especially apparent in nurses who worked consecutive 12 hour shifts, especially consecutive night shifts. Such sleep and fatigue leads to faulty decisions and decision regret (Scott, Arslanian-Engoren and Engoren, 2014). Some states have addressed this issue by limiting the number of hours that nurses can work. Bae and Yoon (2014) found that state policies limiting mandatory overtime and consecutive work hours resulted in an 11.5% decrease in the likelihood of nurses working more than 40 hours in a week.

Essential for Safety

Nurses are aware of the number of hours they have worked in a day or week. They need to limit their work hours to 12 hours per shift and 60 hours per week to enhance patient safety.

The Role of the Critical Care Nurse

According to the American Association of Critical Care Nurses (AACN, n.d.a), "**critical care nursing** is that specialty that deals specifically with human responses to life-threatening problems. A critical care nurse is a licensed professional nurse who is responsible for ensuring that acutely and critically ill patients and their families receive optimal care." In 2013, 57% of nurses stated their primary employment position was a hospital, and 17% identified their primary nursing practice position as acute care/critical care (Budden, Zhong, Mouton, and Cimioti, 2013). However, critical care nurses work wherever patients with potentially life-threatening problems may be found, and that includes EDs, outpatient surgery centers, and even schools.

The AACN believes that critical care nursing should be defined more by the needs of the patients and those of their families than by the environment in which care is delivered or the diagnoses of the patients. Therefore, the organization developed the Synergy Model for Patient Care based on the patient's characteristics, the nurses' competencies, and three levels of outcomes derived from the patient, the nurse, and the healthcare system. An underlying assumption of the synergy model is that optimal patient outcomes occur when the needs of the patient and his or her family align with the competencies of the nurse.

Competencies of Critical Care Nurses as Defined by the AACN in the Synergy Model

The AACN Synergy Model for Patient Care (AACN, n.d.b) describes each of the competencies of the critical care nurse on a continuum of expertise from 1 to 5, ranging from competent to expert.

Clinical Inquiry

According to the AACN's Synergy Model for Patient Care, the critical care nurse should be engaged in the "ongoing process of questioning and evaluating practice and providing informed practice." Although worded slightly differently, this competency is similar to the QSEN competencies of evidence-based practice and quality improvement. One way that critical care nurses might demonstrate clinical inquiry would be to provide care based on the best available evidence rather than on tradition. An expert critical care nurse might be able to evaluate research and develop evidence-based protocols for nursing practice in her agency, whereas a competent nurse might follow evidence based agency policies and protocols. Critical care nurses (both novice and expert) can develop the mindset that questioning practice is an issue of safety. A safe practitioner is one who wonders, "Why do we do things this way?" or "Why am I being asked to provide this specific type of care to this patient at this moment?"

Clinical Judgment

The Synergy Model (AACN, n.d.b) states that the critical care nurse should engage in "clinical reasoning which includes clinical decision-making, critical thinking, and a global grasp of the situation, coupled with nursing skills acquired through a process of integrating formal and experiential knowledge." A competent critical care nurse is able to collect and interpret basic data and then follow pathways and algorithms when providing care. She might focus on some specific aspect of care, which a more experienced nurse might recognize as less important. This nurse, when unsure about how to respond, often defers to the expertise of other nurses. An expert nurse is able to use past experience, recognize patterns of patient problems, and "see the big picture." Her previous experience coupled with the ability to see the "big picture" often allows her to anticipate possible untoward events and develop interventions to prevent them.

For example, an ED nurse received a report that a patient with stable vital signs who had a chest injury from a falling brick wall would be arriving in the ED in approximately 5 minutes. On arrival, the patient was extremely pale with new-onset chest pain. The expert ED nurse

requested the new graduate get the physician immediately while she prepared for chest tube insertion. By the time the physician arrived, the patient was displaying clear signs of a tension pneumothorax. However, the expert nurse had everything prepared for immediate chest tube insertion and decompression, and the patient recovered quickly.

Caring Practices

In its descriptions of nursing competencies, AACN defines caring behaviors as “nursing activities that create a compassionate, supportive, and therapeutic environment for patients and staff, with the aim of promoting comfort and preventing unnecessary suffering.” A caring critical care nurse can make an enormous difference in the critical care experience for a frightened patient and family. Whereas a competent nurse might focus on the basic and routine needs of the patient, an expert nurse is able to anticipate patient/family changes and needs, varying caring approach to meet their needs. For example, a son was frightened and kept leaving the bedside of his dying mother. The expert critical care nurse placed a chair at the mother’s bedside and stayed with the son, showing him how to stroke her brow gently and speak to her softly.

Advocacy and Moral Agency

The American Nurses Association (ANA) in its *Code of Ethics for Nurses* (2015) states, “The nurse promotes, advocates for, and protects the rights, health, and safety of the patient” (p.14). On its website (AACN, n.d.a), AACN states that “Foremost, the critical care nurse is a patient advocate and defines advocacy as ‘respecting and supporting the basic rights and beliefs of the critically ill patient.’” The National Council of State Boards of Nursing lists eight elements for the standard of nurse advocacy for patients. Clearly, nursing professional organizations and the nursing licensure body expect nurses to recognize that their patients may be vulnerable and may require assistance to obtain what they need from the healthcare system. However, it is sometimes difficult for nurses to advocate for their patients in the current system. Before the nurse can be an effective advocate, she needs to examine some of her own values and beliefs.

A nurse might want to consider the following:

- What types of issues (including end-of-life issues) might arise in the clinical setting for which the patient may need an advocate?
- What is owed to the patient, and what are the duties of the nurse in those circumstances?
- If she encountered one of those situations, how would the nurse be able to determine what the patient or family desires or what would be in the patient’s best interests?
- Would the nurse be able to differentiate her needs and desires from those of the patient? How certain could she be?
- How would the nurse act for her patient or empower her patient and his family to communicate their needs and desires to the rest of the healthcare team?
- How would the nurse respond if she thought that the quality of a patient’s care was being jeopardized?
- How would the nurse ensure that the discussion was a mutual exploration of concerns and not a confrontation?

According to the AACN (n.d.a), a competent nurse assesses her personal values and patient rights, represents the patient if the patient’s needs and desires are consistent with her framework, and acknowledges death as a possible outcome. However, an expert nurse advocates from the family/patient perspective, whether it is similar to or different from her own; empowers the patient and family to speak for or represent themselves; and achieves mutuality in relationships. For example, a patient and his wife wanted to withdraw interventions because the patient was clearly deteriorating and dying. However, their children, who were scattered about the country and had not seen their father during the hospitalization, were unwilling to support the decision. The nurse caring for the patient helped the wife gather the family at the patient’s bedside. Then the nurse stayed with the patient and his wife as they explained the patient’s condition and their decision to the children.

Systems Thinking

The AACN (n.d.b) in its Synergy Model defines systems thinking as managing the existing environmental and system resources for the benefit of patients and their families. For a vulnerable patient and family, being in an unfamiliar and overwhelming healthcare system can be intimidating, even frightening. Having a nurse who knows how the system works and explains it to the patient and family, or who helps the patient and family obtain what they need, can make the difference between an experience that is overpowering for the family and one that the patient and family believe they can endure. A competent nurse might see himself as a resource for the patient on the specific unit where the patient is receiving care, whereas an expert nurse might know how to negotiate and navigate for the patient throughout the healthcare system to obtain the necessary or desired care. For example, a patient with ALS requested extubation and discharge home for palliative care. His ICU nurse worked for several days with the hospice and palliative care nurses to prepare his home environment and family for his transition to care at home.

Facilitator of Learning

In the Synergy Model, AACN (n.d.b) states that nurses should be able to facilitate both informal and formal learning for patients, families, and members of the healthcare team. A competent nurse might follow planned educational programs using standardized materials or see the patient and family as passive recipients of educational materials. An expert nurse would be able to “creatively modify or develop patient/family educational programs and integrate family/patient education throughout the delivery of care.” For example, a nurse providing heart failure education realized that many of her patients who could not read would not admit that to her. She discovered that if she showed her patients clearly legible print and asked if the print was okay for them to read, the patients who could not read would readily say that the print was a problem and was too difficult to read. The nurse could then plan appropriate ways to teach her patients.

Response to Diversity

AACN (n.d.b) defines response to diversity as “sensitivity to recognize, appreciate, and incorporate diversity into the provision of care.” A similar QSEN competency is patient-centered care. A competent nurse might recognize the values of the patient but still provide care based on a standardized format. An expert nurse would anticipate the needs of the patient and family based on their cultural, spiritual, or personal values, and would tailor the delivery of care to incorporate these values.

For example, a terrified patient was being rushed to a medical center several hours from his home for an emergent mitral valve replacement. Despite the need for haste, the expert nurse realized the importance of faith to this patient and thus arranged for him to receive the Sacrament of the Sick prior to his transfer.

Collaboration

AACN (n.d.b) defines collaboration in its Synergy Model as “working with others in a way that promotes each person’s contributions toward achieving optimal and realistic patient/family goals.” The corresponding QSEN competency is teamwork and collaboration. A competent nurse might participate in multidisciplinary meetings and listen to the opinions of various team members. On the other hand, an expert nurse might facilitate the active involvement and contributions of others in meetings and role model leadership and accountability during the meetings. For example, a preceptor encouraged and assisted his orientee to present information on a complex patient with placenta accreta during multidisciplinary rounds and later during nursing grand rounds.

The Interdisciplinary Nature of Delivery of Care in Critical Care Environments

For optimum patient outcomes, critical care is delivered by a multidisciplinary team whose members trust each other and communicate and collaborate well.

Communication

In 2005, the AACN declared, “Nurses must be as proficient in communication as they are in clinical skills” (p. 190). Optimal patient care is not possible without skilled communication, and errors are frequent in situations where communication between healthcare providers and patients and their families is impaired. Rothschild et al. (2005) found that 13.7% of errors in critical care were related to problems communicating clinical information. Meanwhile, The Joint Commission (2006) determined that a breakdown in communication was the leading root factor in sentinel events between 1995 and 2004 and again in 2005. More recently, impaired verbal or written communication was identified as the cause of approximately 24% of errors in administration of parenteral drugs in ICUs (Valentin et al., 2009). Skilled communication has at least two essential components: the determination of appropriate content for the message, and the way in which the message is conveyed.

Situation Background Assessment Recommendation

The Institute for Healthcare Improvement (IHI; n.d.) currently advocates a technique borrowed from the military that it believes will improve communication among healthcare professionals. This technique, called **Situation Background Assessment Recommendation (SBAR)**, provides a process for determining what information is appropriate and delivering it in a specific manner. The IHI anticipates that using SBAR will prevent what it describes as “multiple calls to the physician when the record makes clear that the patient is deteriorating but the physician is unaware or does not understand the nurse’s statements.” On its website, the IHI provides a document titled “SBAR Report to Physician about a Critical Situation” to guide nurses’ communication. The format is:

S: Situation

- I am calling about (patient, name, location).
- The problem I am calling about is (the nurse states specifics).
- I have assessed the patient personally.

- Vital signs are:
- I am concerned about (the nurse states what the specific concern is).

B: Background

- The patient's immediate history is:
- The patient's other physical findings are (e.g., mental status).
- The patient's treatments are (e.g., oxygen therapy).

A: Assessment

- This is what I think the problem is _____.
- *Or*, I'm not sure what the problem is but the patient is deteriorating.

R: Recommendation

- I suggest (or request) that you (the nurse states the desired course of action).

Two-Challenge Rule

There are times when members of the healthcare team do not listen and respond to each other even when essential information has been communicated in an appropriate format. Sachs (2005) reported on a 38-year-old woman who experienced a critical illness and fetal demise following numerous errors in communication and planning as well as errors in judgment at Beth Israel Deaconess Medical Center. One of the strategies that the hospital adopted to prevent similar problems in the future was to train everyone to challenge other healthcare providers, even those senior to them, if they disagreed with the proposed course of action.

The two-challenge rule is a method adapted from the airline industry's crew resource management. When following the two-challenge rule, a nurse who disagrees with another healthcare provider's proposed intervention would respectfully state his concerns about the intervention twice and then would seek a superior as soon as possible and explain his concerns.

Essential for Communication

Logical, clear reporting of information and respectful presentation of opinion or disagreement enhances patient safety.

Assertive Communication

The second element of the two-challenge rule is that the nurse should present his concerns respectfully while stating his disagreement. There is mounting evidence that disrespectful and intimidating communication contributes significantly to healthcare errors. Connie Barden, past president of the AACN, believes that nurses should speak

with a bold voice. According to her, a bold voice is one that does not blame or whine, it does not argue, and it looks past complaints to work with others on solutions (Barden, 2003).

Lindeke and Sieckert (2005) stated that when a nurse needs to make a case for or against a specific action, she should be assertive but not aggressive. To do this, the nurse should question the decision calmly and directly rather than hinting. For example, "Dr. Jones, I don't understand why dobutamine is the appropriate medication for Mrs. Green. Would you explain?" The nurse also avoids using disclaimers such as "you might think differently" because that can undermine her position.

Collaboration

Evidence supports a model of critical care delivery where dedicated critical care personnel work as a team (Kim et al., 2010). Since 1986 when Knaus et al. found that outcomes in ICUs were "more related to interaction and coordination of each hospital's intensive care unit staff than to the unit's administrative structure, amount of specialized treatment use, or the hospitals' teaching status," the link between teamwork and patient outcomes in ICUs has been repeatedly reaffirmed. For example, Boev and Xia (2015) demonstrated good nurse-physician collaboration resulted in a decrease in infections acquired during critical care hospitalization. Whelan et al. (2003) concluded that the "evidence is sufficient to warrant the implementation of policies designed to improve the level of communication and collaboration among staff members in intensive care units" (p. 527).

Collaboration is a process, not a single event, and it requires that members of the healthcare team develop a pattern of sharing knowledge and responsibility for patient care. A number of characteristics influence the degree of collaboration that occurs among members of a healthcare team. These characteristics are discussed in the sections that follow.

Development of Emotional Maturity. According to Lindeke and Sieckert (2005), emotional maturity is foundational to collaboration because of the positive individual attributes of people who are emotionally mature. These include being lifelong learners, actively identifying best practices, and keeping their skills current. Emotionally mature people are positive, humble, and willing to take responsibility for their failures and try again.

Essential for Collaboration

Having the emotional maturity to pause and reflect on one's own motivations as well as those of others can lead to improved communication and collaboration (Rushton, 2009).
