CHAPTER 1

Philosophy and treatment in US critical care units

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In this chapter, the evolution of critical care practice and advanced nursing roles are explored. An examination of factors that contribute to safe monitoring and treatment in critical care units includes certification processes and national support for critical care nursing practice, perspectives on patient and family-focused care, and the evolution of rapid response team (RRT) roles in hospital settings.

US critical care units

Critical care units were formally developed in the United States in the years following World War II. Common elements driving the origin of critical care units remain important even today, including close patient monitoring, application of sophisticated equipment, and surveillance-based interventions to prevent clinical deterioration or health complications. Today's critical care units are often diverse, specialized areas of care for patients at high risk or those undergoing critical health events requiring nursing attention. The critical care team is generally quite complex, including medical management increasingly supported by intensivists, residents, acute care nurse practitioners (ACNPs), clinical nurse specialists (CNSs), and other nursing personnel. Additional vital practitioners include respiratory therapists, dietitians, pharmacists, social workers, and physical/occupational therapists. Over the last 50 years, sophisticated treatment modalities, technology, and care philosophies have evolved to promote a strong patient-centered care ethic coupled with technological complexity.

The cost of delivering care to the critically ill continues to rise. The Society of Critical Care Medicine (2013a) identified increasing costs of critical care medicine in the United States, with current projections of $81.7 billion (13.4% of hospital costs) in the care delivery of over 5 million patients annually in the nation's critical care units.

Organization of critical care delivery

Haupt *et al.* (2003) published guidelines for delivering critical care based on a multidisciplinary review of the literature and writing panelists with representation from important critical care providers including physicians, nurses, pharmacists, respiratory therapists, and other key critical care team representatives. A three-level system of intensive care unit (ICU) care was promoted in these guidelines, acknowledging various ICU care systems based on the availability of key personnel, educational preparation, certification, and fundamental skill requirements. These general guidelines for hospitals in establishing and maintaining critical care services assigned levels of care as follows:

1 Level I care: units that provide medical directorships with continual availability of board-certified intensivist care and appropriate minimal preparation recommendations for all key and support personnel.
2 Level II care: comprehensive care for critically ill but unavailability of selected specialty

care, requiring that hospitals with units at this level have transfer agreements in place.

3 Level III care: units that have the ability to provide initial stabilization and/or care of relatively stable, routine patient conditions. Level III units must clearly assess limitations of care provision with established transfer protocols (Haupt *et al.*, 2003, p. 2677).

Emphasis on intensivist medical management, diagnostic testing availability, and specialty interventional availability guides hospitals to provide optimal care to the critically ill. This has also been supported by the Society of Critical Care Medicine (SCCM, 2013a). Haupt *et al.* (2003) also made recommendations for graduate education and/or certification by critical care nursing managers within the leadership structure. Transfer protocols for higher levels of care were recommended if selected life-saving services were unavailable, suggesting that protocols be incorporated into patient management systems in all hospitals without the full range of service based upon these guidelines. Despite the fact that these guidelines were advanced over 10 years ago, critical care practice remains diverse across the nation due in part to the availability of key personnel, state emergency system organization, system restrictions due to population and area coverage, and cost constraints. Emergency management and trauma support guidelines have been advanced by the American College of Surgeons (ACS) though the Advanced Trauma Life Support courses and guidelines for the transfer of patients in rural settings are also published on the ACS web site (Peterson and the Ad Hoc Committee on Rural Trauma, ACS Committee on Trauma, 2002).

Monitoring and surveillance in critical care

In the care of critically ill patients, the use of monitoring technology to support care is central to evidence-based practice. Research on the frequency and types of monitoring that affect the best patient outcomes is growing. Selected technologies, such as the use of pulmonary artery catheters in the critically ill, have been studied extensively. But the rapid growth of new technologies for monitoring at the bedside are often labor-intensive, requiring considerable nursing time to set up and manage to ensure good outcomes. In addition, ethical, humane application of technology must be continually considered so that the effect of intrusive or invasive technology is continually monitored in individualized care (Funk, 2011). Effective monitoring requires familiarity with the patient's condition and preferences, the equipment, the processes inherent in obtaining the data, and the interpretation of monitored data, all affected by potential error in acquisition and management. Monitoring allows for the calculation of critically ill patients' physiological reserve and effectiveness of interventions but also carries the caveat that practitioners must be familiar with the pitfalls associated with data interpretation commonly found in all areas of acute and critical care practice (Andrews and Nolan, 2006).

Young and Griffiths (2006) reviewed clinical trials monitoring acutely ill patients and observed that "to display data which cannot influence the patient's outcome might increase our knowledge of disease processes but does not directly benefit the monitored patient. Nor is it harmless, more information brings with it more ways to misunderstand and mistreat" (p. 39). More monitoring may not be the answer to improving the treatment of critically ill persons but individualized monitoring of the right parameters to guide therapy and improve patient outcomes is the goal of the critical care team. Revolutionary changes in patient outcomes have been obtained with the development of selected technology, including pulse oximetry, bispectral index for depth of anesthesia, and noninvasive measurement of cardiac output and stroke volume (Young and Griffiths, 2006). Despite the expansiveness of monitoring, many have noted the paucity of evidence of its effectiveness. Particularly in the arena of hemodynamic monitoring, studies have been equivocal regarding the effectiveness of monitoring data to influence patient outcomes (see Chapter 5).

Surveillance

Kelly (2009) studied nursing surveillance and distinguished monitoring from surveillance by noting that surveillance informs decision

making and involves action steps that stem from more passive monitoring. Kelly (2009) defined surveillance as "a process to identify threats to patients' health and safety through purposeful and ongoing acquisition, interpretation, and synthesis of patient data for clinical decision making in the acute care setting" (p. 28). Surveillance is a core role of critical care; while not unique to nursing, surveillance is applied continuously in critical care units worldwide. Henneman, Gawlinski, and Giuliano (2012) identified surveillance as a nursing intervention critical to patient safety. In a review of practices recently studied in acute and critical care nursing, Henneman, Gawlinski, and Giuliano (2012) examined the use of checklists, interdisciplinary rounds, and other clinical decisional support and monitoring systems important to surveillance and prevention of errors.

The need for monitoring systems that produce reliable and accurate data has never been more urgent. Monitoring systems should be designed to foster action and supportive care to improve patient and family experience and physiological outcomes for patients. Practices that do not improve patient outcomes should be eliminated. In addition, clinicians need to help patients and family members understand monitoring systems. Continual assessment of changing conditions, critical reflection, critical reasoning, and clinical judgment are all supported with the use of appropriate technology (Benner, Hughes, and Sutphen, 2008). Safe care practices depend on these habits of the mind as well as reliable and accurate technology. The potential for error is evident at many junctures in today's complex hospital systems and the critical care unit is the hub of such concentrated complexity, making surveillance essential for safe patient care.

Research on monitoring and surveillance is increasing. Schmidt (2010) studied the concepts of surveillance and vigilance, and identified the basic social process of nursing support for patients in a critical care environment, ensuring continual vigilance and protective action to ensure safety. Yousef *et al.* (2012) examined continuous monitoring data in 326 surgical trauma patients to determine parameters associated with cardiorespiratory instability. These were defined as heart rate less than 40/min or greater than 140/min; respirations less than 8/min or greater than 36/min; SpO_2 less than 85%; and blood pressure less than 80 mmHg, greater than 200 mmHg systolic, or greater than 110 mmHg diastolic. Patients who remained clinically stable versus those who had even one period of instability were more likely to have more comorbidities, as measured by the Charlson Comorbidity Index. In earlier work, these authors found that 6.3 h ensued between periods of cardiorespiratory instability and activation of a rapid response team (RRT) (Hravnak *et al.*, 2008). In these studies, automated, continuous monitoring recorded and validated in the clinical monitoring system strengthened the data validity, including automated blood pressure measurements measured at least every 2 h. Clear consideration for technology advancement and the effects on both nursing practice and patient outcomes is needed.
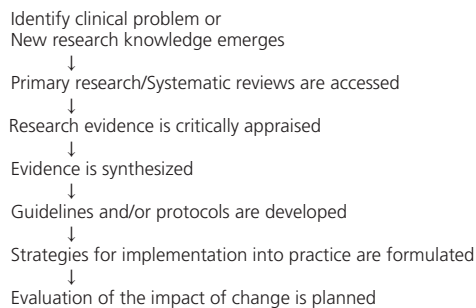
Nursing certification and competency in critical care units

One method of moving toward more consistent and safe practice involves certification in critical care practice. All nurses practicing in the ICU environment have curricula and orientation programs, the ability to become certified in the care of the critically ill, and, in the case of the ACNPs and CNSs, the ability to attain national certification and advanced practice licensure. Does national certification ensure quality care? Kaplow (2011) identified the value associated with nursing certification, including the value to patients and families, employers, and individual nurses, noting that certification validates specialty practice and competency. Research is insufficient in linking certification to improved patient outcomes but denotes a level of professionalism and recognition for increasing education and competency (Kaplow, 2011). Coverage of the many contributions of advanced practice nurses to patient outcome measures will be explored in the following sections.

Studies have shown links between nursing certification and patient satisfaction with care as well as nurses' job satisfaction (Wade, 2009). Fleischman, Meyer, and Watson (2011) reviewed and highlighted best practices to create a culture of certification across institutions in the United States including fostering supportive environments, recognition, and improved research utilization as identified best practices in critical care environments. Wade (2009) identified a sense of increased collaborative practice and empowerment among certified nurses. Further work is needed to validate patient outcomes associated with certification.

Overcoming barriers to integration of research at the bedside remains a challenge to all providers concerned with improved quality of critical care delivery (Leeman, Baernholdt, and Sandelowski, 2007; Penz and Bassendowski, 2006). The use of improved educational strategies to better prepare practitioners for evidence-based practice guidance (Penz and Bassendowski, 2006) and more refined change strategies, including coordination across disciplines, outcome-focused change, and methods to increase behavioral control, such as change leaders or champions, is recommended (Leeman, Baernholdt, and Sandelowski, 2007). In rapidly changing environments such as critical care units, sustained change is difficult to maintain and improved systems are needed for better integration of evidence-based care.

Professional organizations often lead the way in research to practice innovation. The American Association of Critical Care Nurses (AACN, 2013a) has developed a series of practice alerts, available as easy pdf file downloads with selected power point slides for teaching care providers. These are frequently updated by leading researchers in the field and incorporate current evidence for application to practice. Mallory (2010) reported on strategies used by the Oncology Nurse Society (ONS) to promote evidence-based practices for translational research (see Fig. 1.1). Adoption of clinical practice guidelines is not a simple process and often requires the attention of advanced practice nurses and other team members dedicated to attaining a high standard of care and a strong method to ensure sustainable change.

Identify clinical problem or
New research knowledge emerges
↓
Primary research/Systematic reviews are accessed
↓
Research evidence is critically appraised
↓
Evidence is synthesized
↓
Guidelines and/or protocols are developed
↓
Strategies for implementation into practice are formulated
↓
Evaluation of the impact of change is planned

Figure 1.1 Knowledge transformation processes. Adapted from Mallory (2010, pp. 280–284).

Explosive growth has occurred in the application of evidence-based models to guide education and practice. While too numerous to highlight within this book, selected models applied frequently to critical care practice include the Iowa Model (Titler *et al.*, 2001) and the Johns Hopkins Model (Newhouse *et al.*, 2007).

US national critical care organizations

The AACN and the SCCM have a long history fostering collaborative practice and improvement of outcomes for critically ill patients. Vibrant and patient-centered, these organizations work to further the science and practice of members and share a commitment to the advancement of the art and science of critical care practice, including the role of nurses in improving patient outcomes and treatment modalities.

American Association of Critical Care Nurses

The AACN promulgates nursing standards and is affiliated with a certification corporation dedicated to certification of nurses in critical care (AACN, 2013b). With a focus on promotion of patient-centered care and support for critical care nursing practice, the AACN endorses three major advocacy initiatives, including healthy work environments, end-of-life care, and staffing/workforce development. Current certifications available through the AACN certification program include specialty certifications in acute/critical care nursing

(adult, neonatal, or pediatric), earning critical care registered nurse (CCRN) certification; CCRN-E, a tele-ICU version; adult progressive care certified nurse (PCCN) credential; and a certified nurse manager and leader (CNML) credential. Subspecialty certifications are also available in Certification in Cardiac Medicine (CMC) and adult cardiac surgery (cardiac surgical certification, CSC). Advanced practice certifications are transitioning to the consensus model certifications of Adult-Gerontology Acute Care Nurse Practitioner Certification (ACNPC-AG) and ACCNS, CNSs (wellness through acute care), available as gerontology, pediatric, and neonatal designations. Adult advanced practice certification is currently available as adult ACNPC or adult, neonatal, or pediatric versions of the acute care certification of clinical nurse specialist (CCNS) exam (AACN, 2013b). The latter two certifications will continue to be available for renewal but candidates should see the AACN web site for guidance concerning certification eligibility. Certification programs are evaluated every 5 years and are based on competency assessments.

Society of Critical Care Medicine

The SCCM promotes excellence in patient care, education, research, and advocacy in the care of critically ill patients. The SCCM self-identifies as the only organization to represent all professional members of the critical care team and has a membership of nearly 16 000 in over 100 countries (SCCM, 2013b). The SCCM web site includes a compilation of evidence-based guidelines directly applicable to the care of critically ill patients. There are also podcasts and webinars available at no charge along with other practitioner resources.

Acute care advanced practice nursing

As the role of the advanced practice nurse has evolved over the past several decades, implementation of the role differs worldwide. Mantzoukas and Watkinson (2006) sought to clarify generic features of advanced nursing practice through a review of the international literature. In their summary, consistent features included (i) the use of knowledge in practice, (ii) critical thinking and analytical skills, (iii) clinical judgment and decision-making skills, (iv) professional leadership and clinical inquiry, (v) coaching and mentoring skills, (vi) research skills, and (vii) changing practice (Mantzoukas and Watkinson, 2006, p. 28).

Implementation of nurse practitioners (NPs) and CNSs in critical care varies across the United States. While growth in these advanced practice roles is expected, care delivery and role implementation often vary regionally and are often driven by physician and nurse practice patterns, hospital initiatives, and financial support. Kleinpell and Hudspeth (2013) reviewed terminology and organizational frameworks for scope of practice in critical care advanced practice roles. Competencies and national models are reviewed with clarification on the scope of practice of an advanced practice registered nurse (APRN), particularly for ACNPs.

Becker *et al.* (2006) reported on the national task force survey for delineation of the work of advanced practice critical care nurses in an effort to clarify roles of the ACNPs and CNSs. The specific aims of this study were to reveal criticality and frequency ratings for 65 APRN activities and to compare spheres of influence distinctive to each role. Significant distinctions included a focus on individual patients in the role of ACNP (74 versus 25.8% for CNS) and relatively small amount of advanced practice nursing time spent on interventional skills in both APRN roles. Eight activities were reported with greater frequency by ACNPs compared with CNSs: developing/implementing and modifying the plan of care; prescribing medications and therapeutics; comprehensive history and physical examinations; differential diagnoses; ordering diagnostic studies; making referrals; performing invasive procedures; and empowering patients and families as own advocates (Becker *et al.*, 2006, p. 142).

Clinical nurse specialists

The CNS's role is focused on three spheres of influence advanced by the National Association of Clinical Nurse Specialists (NACNS): patients and families, nurses/nursing practice, and organization/systems. It incorporates the AACN Synergy Model (AACN, 2013b), and the competencies of advanced practice nursing presented by Hamric, Spross and Hanson (2009). Outcome assessment in complex environments has become an important part of advanced practice for CNSs and integral to graduate programs.

The NACNS (2009) developed the *Core Practice Doctorate Clinical Nurse Specialist Competencies* in collaboration with other stakeholders. These have been endorsed by a number of national organizations (NACNS, 2009). In this document, expansion of advanced practice competencies to the doctoral level includes emphasis on expanded translational research, interprofessional collaboration, and many other competencies identified by national organizations to advance clinical nursing practice (NACNS, 2009). The competencies that were advanced included client sphere of influence, nurse and nursing practice competencies, and organizational systems competencies (NACNS, 2009).

Altmiller (2011) applied a framework of quality and safety education for nurse competencies using these spheres of influence for CNS preceptors designed to bring transparency to the many contributions made by CNSs to hospital systems that improve care at the bedside but are often difficult to track. These include the influence of skilled CNSs in precepting other nurses, building teamwork and collaboration, implementing evidence-based practice, quality improvement practices, safety promotion through system effectiveness, and informatics applications to ensure effective communication, management of knowledge, and foundational decision making. These competencies were promulgated by the Quality and Safety Education for Nurses (QSEN) project, funded by the Robert Wood Johnson Foundation in response to the initial Institute of Medicine report targeting the education of health professionals to improve safety (Institute of Medicine, 2001; Hughes, 2008).

Acute care nurse practitioners

The evolution the ACNP's role has been attributed to workforce issues related to restrictions in the hours medical students were able to work during residencies (D'Agostino and Halpern, 2010; Kleinpell, Ely, and Grabenkort, 2008; Weinstein, 2002). Among the newest NP roles, ACNPs were first certified in 1975 (Becker *et al.*, 2006). Over time, advanced practice nursing programs emerged with significant variability across the United States. In the past decade, significant progress has been made in promoting standard terminology and educational guidelines for advanced practice nurses (APRN Joint Dialogue Group Report, 2008). In these guidelines, endorsed by most national nursing organizations, the four roles of APRNs are confirmed (clinical nurse specialist, certified registered nurse anesthetist, nurse practitioner, and nurse midwife) and educational guidelines have broadly changed to an educational focus on patient population rather than specialty tracks. APRN regulatory standards encompass guidelines on licensure, accreditation, certification, and education (APRN Joint Dialogue Group Report, 2008), addressed through established standards for guidance on advanced nursing educational program content in the United States. In these guidelines, the specialty role is not distinguished as a broad NP practice categorization (e.g., ACNP, Oncology). The APRN guidelines have evolved so that widespread changes in certification are planned for 2015 (National Task Force on Quality Nurse Practitioner Education, 2012). ACNPs will obtain certification as advanced practice nurses (APRNs) with an adult/gerontology focus or a pediatric focus through selected examinations offered by the American Nurses Certification Corporation (ANCC, 2013). The ANCC identifies December 31, 2014, as the last date for applications for certification as an ACNP. As the NTF guidelines (2012) are implemented, certification will move the ACNP role to an APRN title with specialty exams focused on adult/gerontology or pediatrics. Most ACNP and Oncology educational programs have strengthened the adult/gerontological or

pediatric population focus with continued unique coursework to guide specialty practice. Certification is currently required to obtain state licensure as APRNs. Many current ACNP programs require registered nurse licensure and clinical experience in critical care prior to entry into the NP track although a number of programs nationally allow second baccalaureate or higher degree entry and accelerated progress over several years to graduation. Students interested in becoming safe practitioners must recognize the complexity of the critical care environment and give careful consideration to their own skills and capabilities when examining educational options. The richness of multiple learners with a variety of experience adds value to the learning environment and promotes multidisciplinary communication, an important factor in critical care safe practices, although this is an area that remains understudied.

Kleinpell and Goolsby (2006) evaluated ACNP practice identified by 635 national ACNPs from survey data associated with the 2004 American Academy of Nurse Practitioner database. The majority of studies reviewed the impact of ACNPs and physician assistants in acute and critical care, ranging from evaluating specific patient care and disease management outcomes to communication, compliance with guidelines, and other process management strategies. Studies demonstrate similar patient outcomes delivered by ACNPs and physician assistants (PAs) in critical care settings although few large-scale, randomized studies have been done (Kleinpell, Ely, and Grabenkort, 2008). As the ACNP role evolves and additional research clarifies outcomes, integration within the healthcare team will be better elucidated.

As a relatively new role in critical care, the ACNP role integration into systems has generally enhanced patient satisfaction and collaborative care practices (Cobb and Kutash, 2011; Howie and Erickson, 2002). Hoffman *et al.* (2005) compared outcomes of care managed in a subacute medical ICU to that provided by resident physicians and found no differences in length of stay, readmissions to critical care, or number of patients weaned prior to discharge.

A growing role for APRNs is on hospitalist teams (Kleinpell *et al.*, 2008). Another relatively

recent addition to hospital practice, hospitalist medicine generally represents coverage of care for inpatients by internal medicine, family practice, or pediatric specialties. Over 40 000 hospitalists practice in US and Canadian hospitals and continued growth is expected (Society of Hospital Medicine, 2012).

Critical care and ACNP outcomes research

Within acute care environments, ACNPs may practice in areas beyond the traditional ICU environment. D'Agostino and Halpern (2010) studied the integration of ACNPs into an oncology practice, reviewing educational and support programs for staff to aid transitions to specialty practice. Using a multidisciplinary model, including departments of nursing, anesthesiology, and critical care medicine, the authors provide a structure for planned implementation of the role. Due to regional shortages of ACNPs, other NP specialists, including family NPs and adult NPs may enter NP programs with experience in areas of traditional nursing such as critical care. Following graduation, these NPs may practice in acute care environments or specialty office practices, making it difficult to track practice patterns among ACNPs nationally.

Kleinpell, Ely, and Grabenkort (2008) analyzed research on nonphysician providers in acute and critical care settings, focusing on PAs and NPs. In a systematic review of 145 manuscripts, only two randomized control trials (RCTs) were found by Cooper *et al.* (2002) and Sakr *et al.* (1999). Both of these RCTs were conducted in the emergency department setting. While support for the contributions of NPs and PAs to critical care delivery was found among other strong prospective studies, the level of evidence remains weak and further studies are needed. Further studies targeting dissemination of practice models for advanced practice roles; ICU patient outcome impact of advanced roles; research regarding supply and demand of staffing needs in the ICU, including intensivist and midlevel providers; and studies on billing of services are recommended (Kleinpell, Ely, and Grabenkort, 2008).

Kleinpell (2013) extensively reviewed outcome research in advanced practice nursing, comparing studies across APRN roles. This text provides a strong contribution to the literature on effectiveness of APRNs, summarizing patient and care-related outcomes including studies on economic effectiveness. Overwhelmingly, APRN contributions to care are demonstrated to be strong and equal or superior to the care of other practitioners such as physicians or PAs. In many studies, the addition of an NP team member resulted in improved care delivery, shorter lengths of hospital stay, and reduced costs (Kleinpell, 2013). As the role of the ACNP remains relatively new and evolving, further outcome studies are needed that highlight the cost-effectiveness of these roles such as those attained in specific settings (e.g., cardiac catheterization laboratories, surgical or transplant services) to broader patient treatment lines (e.g., care of congestive heart failure patients and patients on prolonged ventilator management).

As critical care settings evolve, advanced practice nurses and researchers continue to examine changing health-care systems. Burman *et al*. (2009) recommend a reconceptualization of the core elements of NP education and practice, emphasizing stronger classroom and clinical coursework in health promotion and disease prevention. Emerging programs for patients with chronic diseases such as heart failure and chronic obstructive pulmonary disease (COPD) are potentially life-changing as chronic diseases account for 60% of all deaths worldwide. Advanced practice nurses, particularly those with strong education and practice in critical care settings, may contribute significantly to these evolving models of care.

Evolution of families in the critical care unit

In the early days of critical care units, an ethic of isolation of patients emerged, attributable to the beliefs on rest and healing. Familes were often considered a distraction with the potential to interfere rather than support the healing process. AACN and SCCM have joined in promoting less restrictive visiting privileges in the critical care arena. In 2007, Davidson *et al*. promulgated clinical practice guidelines for support of the family in the patient-centered ICU based on an extensive literature review. Categories of studies reviewed and clinical practice recommendations were offered in 10 areas: decision-making, family coping, staff stress related to family interactions, cultural support of the family, spiritual and religious support, family visitation, family environment of care, family presence on rounds, family presence at resuscitation, and palliative care. Most recommendations are based on case series or expert opinion rather than controlled studies but further research needs are highlighted. Of the 43 recommendations given within these guidelines, supportive references and overviews of current practice are analyzed carefully, making these important to new and seasoned practitioners in the critical care environment (Table 1.1).

Research has demonstrated improvements in patient comfort and enhanced support when family presence is less restrictive, including family presence during resuscitation and ventilator weaning (Doolin *et al*., 2011; Happ *et al*., 2007). The team must always seek to balance the presence of families and others who are significant in the patient's life with patient's care needs. The context of family presence must be carefully evaluated since prior relationships with family members may drive whether patients view family presence as helpful or harmful. In their ethnographic research of family presence during weaning from mechanical ventilation, Happ *et al*. (2007) noted that clinicians reported that calming or soothing presence including touch and gentle talk was supportive to patients undergoing weaning trials, while a "tense demeanor, hovering, being overly close, and asking the patient about symptoms, activity tolerance, or weaning progress were considered a hinderance" (p. 56). Many studies have confirmed the needs of families as well as patient-identified desire to have family and/or significant others present in the ICU. Henneman and Cardin (2002) offered a 10-step approach to improve family-centered care in the ICU with a focus on multidisciplinary involvement and inclusion of the philosophy from orientation of

Recommendations (Davidson *et al.*, 2007)	Sample recommendation	Evidence grade
1 Decision-making	Decision making in the ICU is based on a partnership between the patient, his or her appointed surrogate, and the multiprofessional team (p. 608)	B
2 Family coping	ICU staff receives training in how to assess family needs and family members' stress and anxiety levels (p. 609)	C
3 Staff stress related to family interactions	The multiprofessional team is kept informed of treatment goals so that the messages given to the family are consistent, thereby reducing friction between team members and between the team and the family (p. 610)	C
4 Cultural support of the family	On request or when conflict arises due to cultural differences in values, when there is a choice of providers, the provider's culture is matched to the patient's (p. 610)	C
5 Spiritual and religious support	Spiritual needs of the patient are assessed by the health-care team, and findings that affect health and healing incorporated into the plan of care (p. 612)	C
6 Family visitation	Open visitation in the adult intensive care environment allows flexibility for patients and families and is determined on a case-by-case basis (p. 613)	B
7 Family environment of care	Improve patient confidentiality, privacy, and social support by building ICUs with single-bed rooms that include space for the family (p. 613)	B
8 Family presence on rounds	Parents or guardians of children in the ICU are given the opportunity to participate in rounds (p. 614)	B
9 Family presence at resuscitation	Institutions develop a structured process to allow the presence of family members during cardiopulmonary resuscitation of their loved one that includes a staff debriefing (p. 615)	C
10 Palliative care	Assessments are made of the family's understanding of the illness and its consequences, symptoms, side effects, functional impairment, and treatments and of the family's ability to cope with the illness and its consequences. Family education should be based on the assessment findings (p. 616)	D

Adapted from Davidson *et al.* (2007).
Evidence grades: B, systematic reviews or strong cohort studies; C, case series or weak cohort studies; D, expert opinion.

new staff members to initial encounters with family members of patients admitted to the ICU. They suggest that clarity be first reached among the multidisciplinary team with endorsement of a family-centered philosophy that should be systematized in a unit. Family-centered care is much more than simple visitation policies and involves true trust and collaboration between patients, their families, and the care team.

Doolin and colleagues. (2011) credit Foote Hospital in Jackson, Michigan, as the first to implement a formal hospital policy supporting family presence during resuscitation. They offer a strong review of the literature guiding family presence, including a review of attitudes and beliefs of patients, caregivers, and family members and historical issues associated with hospital policies concerning family presence. A strong advocacy role for APRNs in promoting policies that support family presence and other evidence-based interventions in critical care areas is needed.

Progression and development of rapid response teams

RRTs have emerged over the past 10 years as a means to improve patient safety and reduce failure to rescue situations. Sonday, Grecsek, and Casino (2010) reviewed the role of NPs in the application of RRTs, describing an approach driven by an ACNP model. The authors observed that this approach provides for patient-centered care by relying on expert assessment, critical thinking, and medical management skills rather than static protocol-driven management. In a primary physican/ICU nurse mode, Buist *et al.* (2002) retrospectively analyzed the patient outcomes associated with the implementation of a medical emergency team following unexpected cardiac arrests in hospitals. Examining data from 1996 compared with 1999, they found significant reductions in cardiac arrests and reductions in mortality from 77 to 55% following the introduction of medical emergency teams within the hospital. Comparative odds

ratio for cardiac arrest with the team in place was 0.50 (0.35–0.73) (Buist *et al.*, 2002).

The use of integrated systems has grown in the intensive care environment. Tarassenko, Hann, and Young (2006) examined the use of integrated monitoring systems for early warning of patient deterioration and activation of RRTs. In one evaluation of a system designed to trigger activation of the team, an early warning system trended five vital sign measures and data fusion to create a single status measure. Patients' heart rate, blood pressure, oxygen saturation, skin temperature, and respiratory rate were combined to produce this single measure. Most alerts were found to be valid but other important measures of evaluation, including mental status and urine output, remained dependent on regular assessments.

Cherry and colleagues (2009) examined a response team designed to activate for a series of patient conditions, including changes in vital signs, cardiac rhythm, mental status, oxygenation decline, altered fluid status, and symptoms such as chest pain, dyspnea, or stroke signs. After implementation, improved outcomes included timeliness of response of the team within 10 min and significant reductions in non-ICU cardiac arrests.

Critical care practice continues to evolve and the role of advanced practice nursing in patient care continues to grow and be refined. While practice patterns and financial issues often dictate the implementation of these roles at the bedside, advanced practice nurses will increasingly play a role in surveillance, treatment, and safety of critically ill patients in the future.

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