AACN Mission
Patients and their families rely on nurses at the most vulnerable times of their lives. Acute and critical care nurses rely on AACN for expert knowledge and the influence to fulfill their promise to patients and their families. AACN drives excellence because nothing less is acceptable.

AACN Vision
AACN is dedicated to creating a healthcare system driven by the needs of patients and families where acute and critical care nurses make their optimal contribution.

AACN Core Values
As AACN works to promote its mission and vision, it is guided by values that are rooted in, and arise from, the Association’s history, traditions and culture. AACN, its members, volunteers and staff will honor the following:

- **Ethical accountability and integrity** in relationships, organizational decisions and stewardship of resources.

- **Leadership to enable individuals to make their optimal contribution** through lifelong learning, critical thinking and inquiry.

- **Excellence and innovation** at every level of the organization to advance the profession.

- **Collaboration** to ensure quality patient- and family-focused care.
Acknowledgments - v
AACN Tele-ICU Task Force

Introduction - 1

Purpose - 2
  Background and Definitions

Conceptual Frameworks - 4

AACN Tele-ICU Nursing Practice Guidelines - 5
  Practice Guideline 1 - 5
  Practice Guideline 2 - 6
  Practice Guideline 3 - 7
  Conclusion - 7
  References - 8

Appendix - 9
  Partnership for a Healthy Work Environment
Acknowledgments

aacn tele-icu task force

The American Association of Critical-Care Nurses recognizes the experts who contributed their knowledge, counsel, and time to the AACN Tele-ICU task force in support of AACN’s burgeoning role in the tele-health and tele-ICU fields. The thoughtful work of our task force members was key to development of these guidelines, which will enhance the level of practice and patient outcomes as tele-ICU nursing practice evolves. Reviewers were chosen for diversity of their roles and perspectives, adding significant depth and richness to the document.

Connie Barden, RN, MSN, CCRN-E, CCNS (Co-Chair)
Director of Telehealth Initiatives
eICU Lifeguard
Baptist Health South Florida

Theresa Davis, RN, MSN, NE-BC (Co-Chair)
Clinical Operations Director
enVision eICU
Inova Health System

Maureen Seckel, RN, MSN, APN, CCRN, CCNS, ACNS-BC (Board Liaison)
Medical Pulmonary Critical Care Clinical Nurse Specialist
Christiana Care Health System

Mary Pat Aust, RN, MS (Staff Liaison)
AACN Clinical Practice Specialist

Wendy Deibert, RN, BSN
Executive Director Telemedicine Services
Mercy Watch
Mercy Health System

Phyllis Griffin, RN, MSN
Director
eLink Critical Care
Cone Health

Carrie Hawkins, RN, MS, CCRN
Nurse Manager
Tele-ICU
VA Eastern Colorado Health Care

Pat Herr, RN, BSN
Director
Avera eICU Care
Avera Health

Crystal Jenkins, RN, MHI
(Formerly) Senior RN Manager of Operations
iCare Intensive Care & iCare Med Surg
Banner Health System

Mary McCarthy, RN, BSN
Nurse Manager
Critical Care Connection
Eastern Maine Medical Center
Carol Olff, RN, MSN, CCRN-E, NEA-BC  
Operations Manager  
Tele-ICU Center  
John Muir Health

Expert Reviewers:

Christie E. Artuso, RN, EdD, CNRN  
Director, Neuroscience Services  
Providence Alaska Medical Center

Elaine Comeau, RN, MS, FACHE  
Chief Nurse Executive  
TeleHealth Solutions  
Philips Healthcare

Susan F. Goran, RN, MSN  
Operations Director  
MaineHealth VitalNetwork  
Maine Medical Center

Ramón Lavandero, RN, MA, MSN, FAAN  
Senior Director, AACN  
Clinical Associate Professor  
Yale School of Nursing

Marthe J. Moseley, RN, PhD, CCNS  
Associate Director Clinical Practice  
Office of Nursing Service  
VA Central Office

Margaret Mullen-Fortino, RN, MSN  
Operations Director  
Penn e-ler  
University of Pennsylvania Health System

Mary Myers, RN, MSN  
Chief Nurse Officer and Vice President of Patient Care Services  
IU Health West Hospital

Theresa Rincon, RN, BSN, CCRN-E  
Director of Nursing  
eICU Services  
Sutter Health

Maureen Swick, RN, MSN, PhD, NEA-BC  
Senior Vice President, Chief Nurse Executive  
Inova Health System

Anita K. Witzke, RN, MSN  
Director of Tele-ICU  
University of Maryland eCare  
University of Maryland Medical System
INTRODUCTION

AACN Scope and Standards for Acute and Critical Care Nursing Practice, which describes the specialty practice and standards for performance of acute and critical care nursing, acknowledges the expansion of the practice beyond the walls of the ICU. These standards apply to critical care nursing in traditional as well as newer, less-traditional practice settings such as the tele-ICU. “In essence, acute and critical care nursing practice is performed wherever acutely and critically ill patients are found.”1 However, subspecialty critical care nursing practice varies depending upon the setting in which that practice takes place. Innovative models, such as the tele-ICU, may require additional practice guidelines.

In August 2010, the American Association of Critical-Care Nurses (AACN) convened a Tele-ICU Task Force to delineate guidelines that pertain to tele-ICU nursing practice. Task force members represented nurses in tele-ICU leadership positions from diverse organizational settings who have experience using a variety of technology vendors with varying practice models. These guidelines were developed through a series of face-to-face meetings and calls to clarify the practice of tele-ICU nursing by asking fundamental questions such as, “what is the unique contribution of the tele-ICU nurse without which patient outcomes will suffer?” A panel of 10 expert reviewers representing a wide variety of roles and experience in tele-ICU nursing practice validated the guidelines, essential elements, and supporting text.

Because tele-ICU nursing is a subspecialty still in its early days, solid research evidence on the practice does not yet exist. The following discussion and guidelines reflect current best practice and AACN’s Tele-ICU Task Force expert opinions. The rapidly changing and diverse nature of tele-ICU nursing practice requires nurses to be nimble and collaboratively create the best environments and models for advancing the practice. In fact, over the course of the two years that the AACN Tele-ICU Task Force met, many of the organizations represented experienced rapid growth in tele-health services. These included expansions such as tele-progressive care, tele-stroke, tele-mental health, and tele-pharmacy. There is no doubt that tele-health services will continue to expand beyond what can even be imagined today. Research focused on best practice models and operational interventions must be ongoing and disseminated widely to enhance the level of practice and patient outcomes as tele-ICU nursing practice evolves.
Purpose

This document defines tele-ICU nursing and identifies the essential components that will assist tele-ICU nurses, managers, and program directors to evaluate their individual or unit practice. It also serves as a guide to identify strengths and opportunities for improvement, facilitating the creation of an environment in which tele-ICU nurses make their optimal contribution to patient- and family-centered care. In addition, these guidelines will support health care organizations seeking to implement a tele-ICU by identifying the essential components of tele-ICU nursing practice necessary for the successful integration of tele-ICU nurses as valued members of the health care team. These guidelines are not intended to be a comprehensive guide for developing and operating a tele-ICU program, but rather a tool to inform and evaluate tele-ICU nursing practice.

Background and Definitions

Early reports of tele-ICU systems began in the 1970s with models that included on-site providers linking with off-site consultants to discuss patients. At that time, remote providers had no direct access to patients or their medical information. In 1982, the first report of a clinical trial of telemedicine in the ICU was published in Critical Care Medicine, when Grundy and colleagues described their intermittent telemedicine consultation service between intensivists in a university setting and an inner-city hospital with no on-site intensivists. The first report of a round-the-clock intensivist model was published in 2000, when Rosenfeld and colleagues described a telemedicine intensivist program for a 10-bed trauma and surgical unit in an academic-affiliated community hospital. Since that time, tele-ICUs have increased in number across the U.S., and currently more than 40 programs exist, reaching more than 250 hospitals and more than 10% of the ICU patients in the country.

The early design of the tele-ICU concept utilized a physician-only model of care. Critical care nursing was quickly identified as a necessary component for the provision of safe patient care. Today, most tele-ICUs employ a collaborative model of care that includes nurses, physicians, and administrative support personnel. Some models also include advanced practice nurses, pharmacists, and other members of the interprofessional health care team. Despite variations in intensivist staffing in tele-ICUs, nearly all units have coverage by critical care nurses 24 hours a day, 365 days a year. Despite the presence of nurses in the tele-ICU since the early days, only in the past several years has the practice of tele-ICU nursing been described in the literature and acknowledged as an emerging subspecialty of critical care nursing.

Studies of practice conducted by AACN in 2006 and 2008 demonstrated the evolving practice of tele-ICU nursing over time when compared to traditional bedside critical care nursing practice. In 2009, the activities of nurses and types of patients aligned the two practice areas closely enough that the initial CCRN certification credential was fully extended to the practice of tele-ICU nurses and designated as CCRN-E.

For the purposes of this document, the following definitions apply and serve as the context for the guidelines:

Telemedicine

The use of medical information exchanged from one site to another via electronic communications to improve patients’ health status.

Telenursing

The practice of nursing over distance using telecommunications technology.
**Tele-ICU**

Networks of audiovisual communication and computer systems that link critical care physicians (intensivists) and nurses to intensive care units (ICUs) in other, remote hospitals.4

**Critical Care Nursing**

The nursing 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 high acuity and critically ill patients and their families receive optimal care. Critical care nurses practice in settings where patients require complex assessment, high-intensity therapies and interventions, and continuous nursing vigilance. Critical care nurses rely upon a specialized body of knowledge, skills, and experience to provide care to patients and families and create environments that are healing, humane, and caring. Foremost, the critical care nurse is a patient advocate. AACN defines advocacy as respecting and supporting the basic values, rights, and beliefs of the critically ill patient.

**Tele-ICU Nursing**

Critical care nursing, as defined by AACN, practiced over distance using telecommunications technology. In addition to the knowledge, skills, and abilities required for bedside critical care nursing, tele-ICU nurses must possess high-level skills in communication, collaboration, decision making, systems thinking, and computer literacy, due to the remote nature of their practice environment. The tele-ICU nurse continuously monitors data on large populations of patients and acts as real-time clinical decision support to collaborate with bedside nurses on conditions that require immediate attention.
The AACN Scope and Standards for Acute and Critical Care Nursing Practice is grounded in three conceptual frameworks. The nursing process provides the model for nursing practice that describes the steps nurses take to create, implement, and evaluate a plan of care.\(^1\) The AACN Synergy Model for Patient Care is the framework that describes the creation of optimal patient care and outcomes when patient characteristics and nurse characteristics are effectively matched. AACN Standards for Establishing and Sustaining Healthy Work Environments: a Journey to Excellence provides the rationale and criteria for creating the optimal environment in which nurses can provide care. Each of the six standards is essential to a healthy tele-ICU work environment. Because of the unique challenges that are inherent in the relationship between the tele-ICU and the remotely monitored ICU, skilled communication and true collaboration are particularly applicable to successful implementation of the tele-ICU nursing model of practice.

In addition to the above models, relational coordination is a theoretical foundation that is especially relevant to tele-ICU nursing practice. The theory describes the components of key relationship dimensions as shared goals, shared knowledge, and mutual respect.\(^7\) These components are critical to the successful coordination of care between individual critical care units and the tele-ICU. In this model, the patient is the central component of all interactions between the remote site and the ICU. With the patient at the forefront, shared goals lead to positive patient outcomes. Shared knowledge is described as evidence-based practice and clinical expertise. Mutual respect is demonstrated by the acceptance of each individual’s unique talents, skills, and contributions, delivered through effective communication. If there is mutual respect between two individuals, the quality of communication and their interactions is enhanced. A model of success for the tele-ICU (see Figure 1) includes these dimensions of relational coordination combined with bold, authentic leadership, skilled communication, collaborative relationships, and expert clinical practice. In this model, the optimized use of technology is the vehicle for delivering high-quality care to patients regardless of location. All of these factors combine to contribute to positive patient outcomes.

![Figure 1 Tele-ICU Model of Success](image-url)
AACN Tele-ICU Nursing Practice Guidelines

These guidelines are systematically developed statements that provide the best available evidence and/or expert consensus. They function as a resource for registered nurses who practice within the tele-ICU model of care. Each statement is considered an essential element in the practice of tele-ICU nursing. These guidelines are not all-inclusive, as each individual organization is influenced by its own structures, processes, and culture. Each guideline is considered essential as all are necessary to the successful practice of tele-ICU nursing. These statements provide guidance as tele-ICU nurses strive to contribute their expertise and knowledge to care for acutely and critically ill patients.

practice guideline 1

Tele-ICU leaders and nurses must establish and sustain an environment that promotes effective communication, collaboration, and collegiality to ensure optimal quality outcomes.

Essential Elements

- Tele-ICU nurses demonstrate that shared goals, shared knowledge, and mutual respect are the elements necessary to create successful integration between the tele-ICU environment and bedside nursing practice.
- Tele-ICU nurses employ skilled communication, effective decision-making, and true collaboration to enhance and foster relationships with the bedside multidisciplinary team and create optimal outcomes for patients and families.
- The health care organization provides team members with education and resources to promote true collaboration and skilled communication.
- The health care organization defines and evaluates accountability for communication and collaboration, and how a lack of collaboration will be addressed.
- Tele-ICU nursing and medical leaders are equal partners in modeling and fostering true collaboration.
- Tele-ICU nurses are recognized and recognize others for the value each individual brings to patient care.
- The health care organization encourages meaningful recognition of the tele-ICU nurse's contribution to patient care and quality outcomes.
- Tele-ICU nursing leaders, in collaboration with tele-ICU nursing staff, create policies to standardize tele-ICU procedures. These include but are not limited to:
  - Virtual rounding
  - Patient and family communication and education
  - Monitoring and response to alerts and alarms
  - Management of bedside emergency situations
  - Patient care hand-offs
  - Documentation
  - Debrief of cases/events
  - Downtime procedures
  - Escalation process to address real-time care concerns
• Tele-ICU nurses have unique environmental challenges in protecting patient privacy and confidentiality. Strict adherence to Health Insurance Portability and Accountability Act (HIPAA) regulations is vital to the function of the tele-ICU.

• Tele-ICU nurses recognize and address the unique ethical dilemmas and moral distress that can occur in the tele-ICU environment.

• The health care organization has an established process to promote dialogue and resolution of ethical dilemmas and moral distress.

• Tele-ICU staffing models are established to ensure the provision of high-quality and safe patient care.

• Processes are in place to evaluate the impact of tele-ICU staffing decisions on patient care.

practice guideline 2

Tele-ICU nurses must demonstrate proficiency in specific knowledge, skills, and competencies to contribute maximally to patient outcomes and nursing practice.

Essential Elements

• Tele-ICU nurses have broad-based experience with demonstrated knowledge and skills in bedside critical care prior to working in the tele-ICU.

• Tele-ICU nurses possess the same foundational critical care knowledge base as bedside ICU nurses.

• Tele-ICU nurses promote the translation of evidence into usable, relevant, and accessible knowledge.

• Tele-ICU nurses demonstrate continuing competence appropriate to their role in the tele-ICU.

• Tele-ICU nurses demonstrate the knowledge and ability to work with multiple computer applications and audiovisual tele-ICU monitoring systems.

• Every team member – remote and bedside – employs strategies to manage any unintended or undesirable consequences of remote-monitoring technology.

• Tele-ICU nurses exhibit the ability to serve as a resource to the interprofessional team.

• The health care organization supports tele-ICU nurses in achieving and maintaining certification to validate their expertise in working in the tele-ICU environment.

• The health care organization ensures that licensing and regulatory requirements for practice in remote locations are addressed and met.

• The health care organization includes communication and collaboration in its performance appraisal system for tele-ICU nurses, and these are skillfully demonstrated to qualify for professional advancement.
practice guideline 3

Tele-ICU leaders and nurses must be actively engaged in measuring and analyzing outcomes to ensure ongoing improvement in patient care and tele-ICU nurses’ contribution to care.

Essential Elements

- Tele-ICU leaders ensure that tele-ICU-based continuous performance improvement plans are in place and the tele-ICU nurses are engaged in all phases of the plan.
- Tele-ICU nurses collaborate with bedside teams as active partners in continuous performance improvement efforts to achieve optimal patient outcomes.
- Tele-ICU nurses are active partners with bedside teams in ensuring the delivery of evidence-based patient care.
- Tele-ICU nurses study and reflect on their emerging practice to identify, quantify, maximize, and articulate their contribution to patient care.
- Tele-ICU leaders assist nurses to prioritize video assessment and/or patient rounding as a critical component of their practice.

conclusion

Aging and higher acuity patients, increasing need for critical care services, shortages of intensivists and nurses, demands for patient safety, scrutiny of quality results – all of these factors are shaping the landscape of healthcare delivery around the globe. The utilization of telemedicine modalities to deliver care to patients regardless of location is exploding as one solution to addressing these needs.

The advent of telemedicine technologies has brought with it the development of telenursing as a specialty, and tele-ICU nursing now exists as a viable option for improving care delivery and safety for the sickest patients. This emerging subspecialty makes possible a future that was previously not considered. The following scenarios demonstrate only a few of the possibilities:

- In the middle of a blizzard, a nurse in a rural critical access hospital is confronted with a patient in septic shock and acute respiratory distress who is unable to be transferred due to the inclement weather. After consultation with the tele-ICU staff, orders are written for aggressive management of the septic patient. With a click of a button, constant communication is established between the critical access hospital and the tele-ICU nurses. The tele-ICU nurses coach and support the bedside nurses at the critical access hospital throughout the night and collaboratively manage the patient to ensure that interventions are carried out and the patient is responding well to the treatment plan.

- An F4 tornado crosses over a busy interstate highway at rush hour. There are multiple traumatic injury victims creating a mass casualty incident. All aircraft are grounded due to weather, causing numerous trauma victims to be transported to area community hospitals. The tele-ICU is connected to multiple regional hospitals and is activated to provide clinical support for disaster response. An emergency department (ED) nurse at a local community hospital notifies the tele-ICU of a critical trauma patient being intubated and requests a connection to a trauma surgeon. The tele-ICU contacts the trauma center and sets up three-way voice and video to connect the trauma surgeon, tele-ICU, and ED. After
the consult, ongoing support is provided from the tele-ICU team to assist the ED nurses with patient management until transport to the level one trauma center is arranged.

- A new nurse, just off orientation, prepares to transport a patient to radiology for a CT scan. The patient has two chest tubes, and the new nurse feels uncertain about how to safely disconnect the chest tubes from suction and prepare the patient for transport. The nurse pushes the alert button to bring the experienced tele-ICU nurse by camera to assist at the bedside. The tele-ICU nurse is able to coach the ICU nurse through the steps to prepare the chest tubes and the patient for transport. The bedside nurse is relieved and feels confident and supported in caring safely for his patient.

- A nurse calls the tele-ICU at 1 a.m. to describe a patient’s leg wound that appears to be worsening and is in need of immediate attention. With a click of a button, the tele-ICU physician arrives in the patient’s room via camera, visualizes the patient’s leg and realizes the urgency of facilitating immediate intervention. While the tele-ICU nurse assembles and reviews the patient’s lab results, the bedside nurse prepares the patient for the OR, and the tele-ICU intensivist communicates with the surgical services physicians to activate the OR team for the emergent procedure.

- A busy ICU nurse is managing a patient who has been in and out of respiratory distress and is concerned about leaving the patient to begin the admission of a new patient two doors away. The nurse pushes the alert button to bring the tele-ICU nurse to the bedside via camera to stay with the patient while she is down the hall. A short time later, when the patient goes back into respiratory distress, the tele-ICU nurse notifies the ICU nurse and charge nurse that the patient needs immediate assistance. The tele-ICU nurse stays with the nurse and patient via camera in the room, providing decision support and notifying the tele-ICU physician that the patient is in distress and requires intervention.

The guidelines for tele-ICU nursing contained in this document create a framework for tele-ICU nursing practice and a yardstick against which this practice can be measured and developed. They represent expert consensus reflecting what is known of tele-ICU nursing at present, but further research is needed in many areas. An inquiry into appropriate staffing models, the skill mix of tele-ICU care providers, optimal communication methods, and the impact of the technology on patients and families represent just a few of the areas in need of investigation.

Despite the many uncertainties of this emerging practice, fundamental concepts that support it are clear. Shared goals, shared knowledge, and mutual respect are foundational to the practice. Skilled communication, true collaboration, and authentic leadership are essential to produce outcomes where nurses are supported and patients and families receive the highest level of care. The American Association of Critical-Care Nurses calls upon nurses and nurse leaders in traditional ICUs and tele-ICUs to embrace the development of this practice and engage nurses in its utilization and growth.

references

Partnership for a Healthy Work Environment

Tele-ICU/ICU Collaborative

Susan F. Goran, RN, MSN
Margaret Mullen-Fortino, RN, MSN

ABSTRACT
The tele-intensive care unit (ICU) provides a remote monitoring system that adds an additional layer of support for critically ill patients. However, to optimize contributions, the bedside team must incorporate this resource into the patient’s plan of care. Using the American Association of Critical-Care Nurses’ Healthy Work Environment Standards as a platform, we can create and nurture a new partnership model. Strategies that embrace the standards of skilled communication, true collaboration, and effective decision making become mutual goals for improving patient safety and outcomes.

Joint communication guidelines facilitate timely and meaningful communication. Trust and the desire to cooperate encourage provider engagement to strengthen collaboration. The use of tele-ICU technology can assist in the interpretation and transformation of data to affect decision making at all levels to influence patient care. Through the lens of the healthy work environment, the tele-ICU/ICU partnership provides enhanced opportunities for improved patient care and team satisfaction.

Keywords: eICU, healthy work environment, ICU, remote ICU, tele-ICU

Patient safety remains a national concern, as evidenced by frequent consumer and professional reports highlighting the impact of medical errors, hospital infection rates, and other examples of suboptimal outcomes. In 2005, the American Association of Critical-Care Nurses (AACN) recognized the mounting evidence that unhealthy work environments contributed to medical errors and generated an imperative to create healthy work environments (HWEs) to foster patient safety. AACN identified 6 essential standards (described in Table 1) necessary for the establishment and sustainability of HWEs, including skilled communication, true collaboration, effective decision making, meaningful recognition, appropriate staffing, and authentic leadership. This commitment to patient safety is so vital that the Nursing Organizations Alliance, a coalition of 70 nursing organizations, incorporated the principles of HWEs into their organizational strategic plans. However, today’s complex patients require an entire team to address their needs; thus, all disciplines must be engaged in the creation of HWEs.

Recognizing the importance of partnership, AACN launched a cooperative alliance with 4 physician organizational partners, composed of the American College of Chest Physicians, the American Thoracic Society, the Society of...
Critical Care Medicine, and the Society of Hospital Medicine, to promote HWEs that foster safe, quality patient care. As health systems integrate the basic tenants of HWEs, the importance of team and partnership is accentuated. In research exploring the relationship between the HWE and Magnet-designated organizations, Kramer et al concluded, “Development of a healthy work environment is both an intradisciplinary and interdisciplinary collaborative effort and a professional responsibility.”

Patient safety has been the driving force behind other pioneering improvements in care delivery. Conceived as an idea for leveraging insufficient critical care resources in the face of growing demands, the tele-intensive care unit’s (tele-ICU’s) true innovation lies in the ability to engineer system-wide transformation through standardization and immediacy of care, leading to enhanced patient safety and quality outcomes. For more than a decade, the tele-ICU has provided access to critical care resources, such as nurses, physicians, advanced practice nurses, pharmacists, and other health care professionals, while providing simultaneous supervision and interventional services for critically ill patients in geographically disparate intensive care units (ICUs). More than 1 000 000 patients have received care through 1 of approximately 50 tele-ICU systems located in the United States. Although controversy continues about the role of the tele-ICU in patient care, evidence clearly suggests that the tele-ICU can be an effective tool for quality and safety improvement; however, maximum optimization requires the cooperation and partnership of the ICU team.

The purpose of this article is to explore the tele-ICU/IUC partner model in the establishment and sustainability of an HWE by addressing the 3 HWE standards that apply to the overlap areas of care provided to critically ill patients: skilled communication, true collaboration, and effective decision making.

### Understanding the Tele-ICU/ICU Care Model

Tele-ICUs are similar to other ICUs. Both are staffed with expert resources, including nurses, physicians, support staff, and others; each has nursing and physician managerial supervision. Extensive technology provides mutual access to patient data, including real-time waveforms provided by electrocardiography or arterial catheters, medication history, laboratory results, radiology images, clinical documentation, and other pertinent data. Each staff member is accountable for demonstrating competency, identifying patient safety concerns, contributing to teamwork, and improving quality. Separate from the ICU equipment and monitoring alarms, the tele-ICU may (depending on vendor-specific software) have a robust alert system that prompts the investigation of the patient’s clinical status to determine validity of the alert, or the potential need for an intervention. Like their ICU counterparts, tele-ICU staff perform rounds, assessing patients’ status and communicating the need for care changes.

The major difference between the tele-ICU and the ICU is that this assessment and communication are done remotely, perhaps hundreds of miles away from the patient, with the use of

### Table 1: AACN Standards for Establishing and Sustaining Healthy Work Environments

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled communication</td>
<td>Nurses must be as proficient in communication skills as they are in clinical skills.</td>
</tr>
<tr>
<td>True collaboration</td>
<td>Nurses must be relentless in pursuing and fostering true collaboration.</td>
</tr>
<tr>
<td>Effective decision making</td>
<td>Nurses must be valued and committed partners in making policy, directing and evaluating clinical care, and leading organizational operations.</td>
</tr>
<tr>
<td>Appropriate staffing</td>
<td>Staffing must ensure the effective match between patient needs and nurse competencies.</td>
</tr>
<tr>
<td>Meaningful recognition</td>
<td>Nurses must be recognized and must recognize others for the value each brings to the work of the organization.</td>
</tr>
<tr>
<td>Authentic leadership</td>
<td>Nurse leaders must fully embrace the imperative of a healthy work environment, authentically live it, and engage others in its achievement.</td>
</tr>
</tbody>
</table>
high-fidelity video cameras and speakers located in the patient’s room. Camera zoom and pan capabilities allow the tele-ICU practitioner to assess clinical indicators of status such as pupil size, skin color, or mental status and to view settings on intravenous pumps, ventilators, or other supportive devices. Two-way audio and video capabilities allow bidirectional communication with in-room staff, physicians, or the patient and family. The typical tele-ICU nurse monitors care to 30 to 40 ICU patients, and depending on the program design, a tele-ICU physician may care for 100 to 250 patients. The tele-ICU does not replace bedside resources; instead, it encircles the ICU with constant supportive and adjunctive care. However, integration of the tele-ICU into the ICU to form a new partnership takes time, role appreciation, mutual respect, and a common desire to improve patient outcomes. The ICUs in an individual tele-ICU system will vary in culture, types of patients served, size, resource availability, and other variables that can make acceptance and integration a challenge. To achieve optimal patient outcomes, providers must identify strategies that can boost the building of a healthy ICU/tele-ICU partnership.

The HWE initiative can be a very effective platform for constructing the ICU/tele-ICU partnership. Both the tele-ICU and the ICU may be on parallel journeys toward establishing a HWE in an effort to improve care. Individually, each requires the HWE standards of meaningful recognition, appropriate staffing, and authentic leadership to achieve staff satisfaction, but the realization of those standards may differ. For example, a hospital-based certification celebration may provide meaningful recognition for an ICU nurse but may hold limited value for the nurse remote from the hospital setting. Although working in separate environments, both teams overlap at a single point of care, the patient’s bedside. At this intersection (see Figure 1), the standards of skilled communication, true collaboration, and effective decision making are vital to the success of timely patient intervention and improved outcome. A spotlight on achieving these HWE standards provides a shared expectation for the desired behaviors, affords a focus for team training and education, and

---

**Figure 1:** The tele–intensive care unit (ICU) and all the ICU environments within a tele-ICU program are each unique (represented by the large circles) and require their own strategies for building and sustaining the healthy work environment standards of authentic leadership, appropriate staffing, and meaningful recognition. However, both environments overlap at the point of care delivered at the patient’s bedside (shadowed area), providing an opportunity to share in the development of standards. To optimize patient outcomes, partnership efforts must be focused on strengthening the standards of skilled communication, true collaboration, and effective decision making.
holds both teams accountable for the outcomes. So, what does the picture of skilled communication, true collaboration, and effective decision making look like in this collaborative, and how can the partnership accomplish these standards together?

**Skilled Communication: HWE Standard**

**Communication and Patient Safety**

The relationship between communication failure and patient safety is unmistakable. The Joint Commission identified communication failures as the root cause of the sentinel events reported from 1995 to 2004, and as the leading cause in medication errors, delays in treatment, and wrong-site surgeries. Although the impact of poor communication on patient outcomes and staff satisfaction has been well documented, the pursuit of proficiency in interprofessional communication has, for many, been as elusive as the quest for the holy grail. Not a new issue, Frank’s 1961 article on interprofessional communication emphasized, “Messages are often misinterpreted and communication fails because no account is taken of the processes involved, especially in interprofessional communication... Human communication, therefore, is a complex, difficult, and often unreliable transmission of messages when spoken and also liable to distortion when written.”

Little has changed in the past 50 years, and barriers to successful communication can be numerous and complex, as noted in Table 2.18–22 However, given the vulnerability of the critically ill patient and the costs associated with critical care, the risks to the patients’ safety and the organization’s fiscal health are significant without timely interaction, shared information, and skilled communication within all members of the health care team.

Over the years, the ICU “team” has expanded to include nurses, physicians, respiratory therapists, advanced practice nurses, physician assistants, and others who provide direct hands-on care, but as noted by Lingard et al, team is “not as a unified body but rather a complex and fluid entity composed of core and expanded groups.”

Patterns of communication that have sufficed in the past or behaviors tolerated by previous teams may not provide the advanced communication skills required in today’s multifaceted environment. Role stress and lack of interprofessional understanding have been linked to role confusion and territorial disputes. Stress, confusion, and patient ownership issues may be further magnified when part of the team exists remotely, as in the tele-ICU, which may be especially widespread if the decision to become part of a tele-ICU system was made without input from the ICU team, thus essentially imposing an involuntary partnership. This compulsory partnership can result in uncertain communication, unenthusiastic cooperation, and suboptimal tele-ICU outcomes.

**Skilled Communication Within the Tele-ICU: The Impact of Technology**

Inside the tele-ICU, skilled communication begins with the selection and hiring of the tele-ICU staff. Although clinical expertise is required for tele-ICU efficacy, effective listening skills and the ability to foster collaboration were ranked highest among the 11 most desired competencies for tele-ICU registered nurses by tele-ICU leaders. Nurses without

---

**Table 2: Common Barriers to Effective Communication**

Numerous barriers may exist that prevent effective communication between care teams, including the following:

- Personal culture, experiences, values, and expectations
- Hierarchy and authority gradients
- Disruptive behavior
- Gender differences
- Varying levels of skills, experience, education, qualifications, and status
- Differences in accountability, payment, and rewards
- Differences in schedules, shifts, rotations, and professional routines
- Historical interprofessional and intraprofessional rivalries
- Specialized vocabulary
- Technologies that interfere with the articulation of words, the verbalized message, or weaken the nonverbal messages
- Poor typing skills, illegible writing, or poor documentation in the medical record
- Stress, lack of resources, and overworked professionals

<sup>Copyright © 2012 American Association of Critical-Care Nurses. Unauthorized reproduction of this article is prohibited.</sup>
demonstrated proficiency in communication can be injurious to the tele-ICU program and can sabotage healthy tele-ICU efforts.13,24 Once hired, nurses must master tele-ICU technology, including the audio and camera systems. Many mature tele-ICU programs use 1-way video systems; the tele-ICU can see into the patient’s room, but the ICU team cannot see into the tele-ICU. This inability to place the voice and face together further tests the communication pathway, as the ICU receiver cannot see and incorporate the body language of the sender into the interpretation of the message. Tele-ICU nurses must be adept at voice intonation to clearly communicate the desired message without conveying judgment or being patronizing. They must also recognize that even with the camera capabilities, the “picture” of the patient may be incomplete without information from the bedside nurse, because part of the patient’s story may have occurred beyond their view. Excellent inquiry skills are vital to assist the tele-ICU nurse to fully understand the clinical picture from the viewpoint of the ICU nurse or provider. The timing of communication is also important, and the tele-ICU must be sensitive to ICU schedules and workflows to provide communication in an opportune manner with the least amount of disruption in patient care.

Tele-ICU staff indicate that they are often held accountable for the success of the tele-ICU/ICU communication, although they may receive ill-mannered responses from the ICU staff.15,16,23 The ICU staff appear less hesitant to respond in a negative manner to a disembodied voice in the room without a facial connection (1-way video), which may further reduce the collegiality of the relationship and potentially put patient safety at risk. The same hesitancy experienced by a bedside nurse, when a change in a patient’s status necessitates contacting a physician with a history of being unpleasant, is experienced by the tele-ICU nurse when repeatedly spurned by the bedside team. Hesitancy to act can lead to less timely care or failure to rescue, resulting in unfortunate patient outcomes. To help address this communication barrier, newer tele-ICU programs use 2-way video technology, which provides the face-to-face communication that can engender more effective messaging. The value of this newer technology should not be minimized; dual visualization may provide less sense of “big brother watching” and improved collaboration.9,15,25

Technology is often a mixed blessing, and many tele-ICU programs are exceedingly complex, requiring interfaces between numerous software systems and organizations with various connectivity options. The tele-ICU must engage its Information Services Department as partners to ensure that the audio and video equipment and connections are maintained in peak working order to prevent communication failures related specifically to technology mishaps.

Achieving Tele-ICU/ICU Skilled Communication

The AACN standards affirm that skilled communicators should be solution and outcome focused, seek to advance collaboration, seek out and hear various perspectives, use mutual respect to build common understanding, build accountability for actions, and build structures for effective information sharing.1 Skilled communication is the essential foundation for tele-ICU/ICU interaction and thus patient safety; communication education and competency measurement must be ongoing.24 Strategies to acquire skilled communication require individual time and organizational fiscal commitment. Individual self-analysis of one’s communication style is an important first step to achieving more meaningful relationships in the workplace.26 The Five-Factor Model for Becoming a Skilled Communicator emphasizes 5 required elements (awareness of self-deception, becoming authentic, candid, mindful, and reflective) as necessary for becoming a skilled communicator.27 Skilled communication requires the ability to acknowledge our own misconceptions, to allow the meaning of an experience to change our future practice, to use heightened attentiveness to verbal and nonverbal communication, and to speak frankly without bias.27

In addition to variable individual skill levels, the tele-ICU/ICU partnership is further complicated by the remote relationship. Distance (both geographic and cultural) between the ICUs and tele-ICUs can be a complicating factor in the fusion of the tele-ICU/ICU team and the ensuing extension of patient ownership from “my patient” to “our patient.” Occasions designed to allow ICU staff and the tele-ICU staff to share and exchange experiences, such
as joint quality meetings, staff meetings, or educational events, are necessary to build a healthy relationship with skilled communication. Stories of successful tele-ICU/ICU communications and their impact on patient outcomes should be collected and underscored in shared forums to reinforce the role of skilled communication in improving patient safety. Sharing standardized communication tools such as SAFE (Situation/Assessment/Findings & Figures/Express & Expect), developed at Baylor University Medical Center, or SBAR, (Situation/Background/Assessment/Recommendation), developed at Kaiser Permanente, to convey information, especially in high-risk situations, is emphasized by many regulatory and quality groups, such as the Institute of Medicine and the Institute of Healthcare Improvement. Incorporation of the tele-ICU into ICU team rounds is another strategy that enhances the exchange of ideas within the partnership and provides a basis for effective decision making. Laughter is known to play a partner role in both the creation of trust and team bonding, so opportunities for shared celebrations or fun events should be considered for team enhancement.29,30 Table 3 provides additional integration strategies that can build skilled communication.15,18–22

Table 3: Strategies for Building a Structure for Enhanced Tele-ICU/ICU Skilled Communication

Efforts to improve communication between the tele-ICU and ICU teams must begin early in the program implementation phase and remain ongoing throughout the continued relationship.

- Cultivate a standard set of joint behavior policies and procedures that are universally applied; include the process for reporting disruptive behaviors without fear of reprisal.
- Encourage educational strategies with a focus on skilled communication: include both general and specific curricula to meet the learning needs of all types of adult learners, and include formal team-building activities.
- Develop and implement competency assessment and validation on an ongoing basis, and include both ICU/tele-ICU competency of audio and camera equipment.
- Select a joint standardized clinical communication tool such as Situation/Background/Assessment/Recommendation (SBAR) or interdisciplinary check-off tools for communication during patient rounds.
- Select clinical champions to model desired behaviors and advocate skilled communication as a patient safety measure.
- Develop joint quality goals and measures to which both teams are accountable.
- Provide opportunities for joint team meetings. Examples include quality meetings, educational offerings, joint staff meetings, research participation, and joint celebrations.
- Encourage tele-ICU participation during ICU orientation, including ICU visits to the tele-ICU or tele-ICU staff visits to the ICU.
- Implement formal liaison programs.

Abbreviation: ICU, intensive care unit.

Copyright © 2012 American Association of Critical-Care Nurses. Unauthorized reproduction of this article is prohibited.
leadership, with the goal of improved communication between the units.

The tele-ICU/ICU partnership’s mission to build and sustain an HWE must begin with skilled communication. The overlap of care that occurs at the patient’s bedside must support open, positive, and ethical communication in an emotionally and physically safe environment. An intentional positive regard for self and others is essential in skilled communication but requires knowledge and an understanding of role and purpose between the tele-ICU team and the ICU team.26–28 The willingness to change from a “my patient” to an “our patient” paradigm not only enhances communication but also acts as a building block for highly functional teams, a necessity for improved patient care. Skilled communication is essential for the attainment of an HWE and is a prerequisite for true collaboration, another necessary standard for partnership success.

True Collaboration: HWE Standard

Importance of Team Collaboration

Effective team collaboration has been associated with improved patient outcomes in the ICU, including lower than predicted mortality rates, fewer ICU readmissions, reduction in ventilator-associated pneumonia and ventilator time, and a reduced presence of pressure ulcers.31–36 Conversely, unsuccessful collaboration has been linked to poor patient and family and staff satisfaction, poor nurse retention, increased cost, and suboptimal patient safety and quality outcomes. AACN emphasizes that nurses must be “relentless in the pursuit and fostering of true collaboration”; it is more than simply lip service and is a process, not an event.37 However, effective team collaboration has often proven elusive. Even the definition of collaboration appears discipline specific, with significant differences in perceptions of effective collaboration between nurses and physicians.37–41 Tension between interprofessionals threatens the delivery of health care with potential negative effects on both patient outcomes and collective outcomes, such as team function or morale, and ethical decision making.20–23,37,38 Gerardi and Fontaine define true collaboration as “both a way of being and a way of working”; collaboration occurs “at the intersection between self-reflection and active engagement. It is simultaneously a conscious act by individuals and the product of group wisdom.”39(p10)

Collaboration is not about just using the buzzwords, collaborating only when convenient, hoarding patients’ information to maintain personal power, or advocating only your position. True collaboration comes from the intense desire to understand and value the perspectives of each member of the team.39 The foundation of collaboration is the mutual trust born from collegial relationship building and skilled communication.35–39 Trust is necessary to ensure the open sharing of all necessary information for patient care and the capacity to resolve potential conflicts before they escalate, preventing further communication. Schmalenberg and Kramer40 explain that collaborative relationships are based on mutuality but may not require equality; for example, the nurse may freely state his or her concerns about the patient to the physician with the understanding that the physician will have the final authority to act. Mutuality is about supporting the shared patient’s goal with mutual respect and cooperation. Such is true of the tele-ICU/ICU collaborative; the tele-ICU shares assessments with the bedside team and makes recommendations for care; the tele-ICU physician may even provide physician orders. However, the final authority for the treatment plan lies with the bedside attending physician.

Many of the same challenges encountered while developing skilled communication between the 2 teams exist in attaining true collaboration. Even without the challenges unique to the tele-ICU/ICU relationship, obstacles to interprofessional and interdisciplinary collaboration are numerous and well discussed in the literature. Each barrier can be addressed with planning; ideas for overcoming the collaboration challenges are summarized in Table 4.37–41

Collaboration Within the Walls of the Tele-ICU: A Unique Setting

The tele-ICU center, also referred to as “the box” or “the bunker,” is an environment designed to encourage maximum communication and collaboration between all members of the tele-ICU team.25,42 Often located remotely from the ICU, the box is frequently a wide-open room with 1 workstation per 30 to 40 patients. Each workstation displays patient data on 6 to 8 computer screens and requires proficiency at accessing and
Workflow is focused on virtual rounding, investigating and responding to alerts, and providing support and aid to the ICU team.\textsuperscript{15} Staff function as medical detectives; they are able to step back from the distractions and disruptions of the ICU environment and investigate the various clues to the patient’s condition. Time is often available to research and explore unusual diagnoses and obscure laboratory findings or conditions. Discussion of concerns or unusual patient findings occur between the tele-ICU nurses and, as available, the physician. This free flow of information sharing and dialogue provides mutual learning for all members of the team. With the informality of the physical setting and fewer staff members competing for physician time and attention, a unique team atmosphere soon develops. Stafford et al\textsuperscript{42} observed significant “open communication,” “collegiality,” and a sense of “esprit de corps” among the tele-ICU team. The researchers further emphasized that the closeness is not unique to the tele-ICU nursing staff, but the nurses and physicians function “as a true team” and value the role, knowledge, and expertise that each member contributes to the team.\textsuperscript{42} Other tele-ICU experiences have validated this unique relationship.\textsuperscript{15,25} Accustomed to a high level of collaboration within the tele-ICU, establishing the collaborative relationship within the partnership is highly desired by the tele-ICU team.

### Attaining and Sustaining Tele-ICU/ICU Collaboration

Second only to communication failures, teamwork failure is a significant factor in preventable adverse events. Studies exploring the role of the tele-ICU in enhancing patient outcomes underscore the importance of ICU cooperation and acceptance of the ICU team in the achievement of improved patient safety and quality outcomes.\textsuperscript{14,42} An interdisciplinary approach to care blends efforts from all disciplines on behalf of the patient’s care goals. Instead of independent but parallel contributions to patient care, the entire interdisciplinary team is accountable for the patient outcome...“if the patient fails, we all fail.”\textsuperscript{38,41} The remote team, who functions outside of the normal ICU setting, may be perceived as an outsider, without authority and with little accountability for patient outcomes. Lines of authority require clear delineation from the beginning of the relationship. Shared accountabilities must be clearly communicated at all levels of the organization as a foundation for the collaboration. Teams value familiarity over formality; they watch each other’s backs to prevent errors.\textsuperscript{39,41,43}

Recent research by Mullen-Fortino et al\textsuperscript{43} reinforces this concept, as surveyed nurses responded that they were more apt to use ICU

### Table 4: Barriers to Tele-ICU and ICU Collaboration With the Resulting Conflicts, Solutions, and Organizational and Personal Accountabilities (Continued)

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Resulting Conflict</th>
<th>Solution</th>
<th>Organizational Accountability</th>
<th>Personal Accountability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interprofessional differences occur in</td>
<td>Lack of knowledge may be exclusionary; disparate views exist about the nature of</td>
<td>Create opportunities for interprofessional education both during academic training and then reinforced during practice through interprofessional training programs.</td>
<td>Develop structures that support interprofessional education and training.</td>
<td>Seek out the skills and knowledge to enable individuals to function effectively within the team.</td>
</tr>
<tr>
<td>approaches to patient care</td>
<td>patient needs and strategies to meet them.</td>
<td></td>
<td>Design a curriculum focused on the required skills for improved communication and collaboration.</td>
<td>Ask questions if something is not known or understood.</td>
</tr>
<tr>
<td>Interprofessional differences occur in</td>
<td></td>
<td></td>
<td></td>
<td>Expand understanding and application of complexity theory.</td>
</tr>
<tr>
<td>approaches to patient care</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: ICU, intensive care unit.

Searching a variety of hospital-based medical record systems.

---

Copyright © 2012 American Association of Critical-Care Nurses. Unauthorized reproduction of this article is prohibited.
searching a variety of hospital-based medical record systems.

Workflow is focused on virtual rounding, investigating and responding to alerts, and providing support and aid to the ICU team. Staff function as medical detectives; they are able to step back from the distractions and disruptions of the ICU environment and investigate the various clues to the patient’s condition. Time is often available to research and explore unusual diagnoses and obscure laboratory findings or conditions. Discussion of concerns or unusual patient findings occur between the tele-ICU nurses and, as available, the physician. This free flow of information sharing and dialogue provides mutual learning for all members of the team. With the informality of the physical setting and fewer staff members competing for physician time and attention, a unique team atmosphere soon develops. Stafford et al. observed significant “open communication,” “collegiality,” and a sense of “esprit de corps” among the tele-ICU team. The researchers further emphasized that the closeness is not unique to the tele-ICU nursing staff, but the nurses and physicians function “as a true team” and value the role, knowledge, and expertise that each member contributes to the team. Other tele-ICU experiences have validated this unique relationship. Accustomed to a high level of collaboration within the tele-ICU, establishing the collaborative relationship within the partnership is highly desired by the tele-ICU team.

### Attaining and Sustaining Tele-ICU/ICU Collaboration

Second only to communication failures, teamwork failure is a significant factor in preventable adverse events. Studies exploring the role of the tele-ICU in enhancing patient outcomes underscore the importance of ICU cooperation and acceptance of the ICU team in the achievement of improved patient safety and quality outcomes. An interdisciplinary approach to care blends efforts from all disciplines on behalf of the patient’s care goals. Instead of independent but parallel contributions to patient care, the entire interdisciplinary team is accountable for the patient outcome. “If the patient fails, we all fail.” The remote team, who functions outside of the normal ICU setting, may be perceived as an outsider, without authority and with little accountability for patient outcomes. Lines of authority require clear delineation from the beginning of the relationship. Shared accountabilities must be clearly communicated at all levels of the organization as a foundation for the collaboration. Teams value familiarity over formality; they watch each other’s backs to prevent errors. Recent research by Mullen-Fortino et al. reinforces this concept, as surveyed nurses responded that they were more apt to use ICU

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Resulting Conflict</th>
<th>Solution</th>
<th>Organizational Accountability</th>
<th>Personal Accountability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interprofessional differences occur in approaches to patient care</td>
<td>Lack of knowledge may be exclusionary; disparate views exist about the nature of patient needs and strategies to meet them.</td>
<td>Create opportunities for interprofessional education both during academic training and then reinforced during practice through interprofessional training programs.</td>
<td>Develop structures that support interprofessional education and training.</td>
<td>Seek out the skills and knowledge to enable individuals to function effectively within the team.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Design a curriculum focused on the required skills for improved communication and collaboration.</td>
<td>Ask questions if something is not known or understood.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Expand understanding and application of complexity theory.</td>
</tr>
</tbody>
</table>

Abbreviation: ICU, intensive care unit.
telemedicine if they “knew” the tele-ICU physician. A Many opportunities discussed previously to enhance skilled communication have the added benefit of further contributing to true collaboration. Working together on assigned projects breeds the familiarity required for the basis of the relationship, while building trust. Tele-ICUs share a unique view of the ICUs they monitor and are able to identify variation in practice and its potential impact on patient care. Programs such as the identification and screening for and treatment of sepsis, intended to standardize practice, can improve outcomes while reducing cost and provide opportunities for collaboration. Tele-ICUs can also identify resources available system-wide and can be an effective conduit for the development or sharing of protocols and best-practice initiatives. Inclusion of the tele-ICU in interdisciplinary rounds, rapid response teams, and the use of standardized communication tools, such as SBAR, can further enhance collaboration efforts.

Behaviors that negatively affect true collaboration cannot be tolerated; organizations can no longer afford to take a passive approach to the situation, which is especially true for the tele-ICU/ICU collaborative. Joining a tele-ICU program requires significant organizational capital investment; however, to expect a measurable return on investment without addressing a lack of ICU collaboration or the tolerance of disrespectful behaviors is counterproductive. Strategies to address the issues in real time can be effective in preventing any further serious consequences.

Collaboration is not about personal power; it is about the patient’s experience. Tele-ICU/ICU collaboration can be very effective in meeting the needs of patients with complex conditions, as demonstrated in the following example:

During virtual rounds, the tele-ICU physician reviewed the case of a complex, critically ill surgical patient in a community hospital experiencing multisystem organ failure. The patient’s condition had been deteriorating for several days despite the best efforts of the bedside team. In discussion with the tele-ICU nurse familiar with the patient, the physician learns that although the patient appears close to death, his resuscitation status had not been addressed with the family. Concerned, the tele-ICU physician phoned the bedside nurse to validate all information; she expressed distress at the thought of coding this patient who, in all likelihood, would not survive. The tele-ICU physician then spoke with the patient’s covering physician, who agreed that resuscitation efforts would be futile but was reluctant to discuss a decision with the family, as he did not “know” them, and he was busy with an emergency department admission. With the permission of the covering physician, the tele-ICU physician contacted the patient’s wife and daughter and discussed the gravity of the patient’s status and the potential need for resuscitation. Indeed, the patient did have an advance directive, and at the request of the family, the tele-ICU physician entered a do-not-resuscitate order into the medical record, wrote a note about the order and family discussion for the permanent record, and discussed it with the bedside nurse. The quality care for patients.

Skilled communication and true collaboration enhance the ability of the ICU and tele-ICU team to share information and perspective and make more timely and informed decisions in support of patient care. Both standards are fundamental for effective decision making, another HWE standard at the core of quality care for patients.

**Effective Decision Making: HWE Standard**

To fulfill their role as health care advocates, nurses must be involved in making decisions about patient care. Decision-making capabilities are enhanced when nurses feel empowered. According to Rosabeth Kanter, nurses are empowered when the structure of work environments provides access to the resources, information, and support necessary to ensure patient safety and opportunities for growth and development of knowledge and skills. Kanter’s theory of structural empowerment provides the framework for describing the role of the tele-ICU/ICU partnership in accomplishing health system goals.

**Resources**

When making clinical decisions, especially those dealing with patients with complex conditions, practitioners rely on input from colleagues and physicians. The input provided by colleagues is especially valuable in determining the problem and deciding on a plan of
Telemedicine technologies provide the bedside team with access to the resources of a board-certified intensivist specially trained in the management of critically ill patients and experienced critical care nurses. Access to consultation is bidirectional; the tele-ICU may contact the ICU team in response to an alarm, or the ICU team may use an in-room call system to request assistance from the tele-ICU team. The tele-ICU functions as a live decision-support tool, providing recommendations in real time, at the point of care that fits into the workflow of the practitioner. The tele-ICU practitioner is able to rapidly process the data and analyze trends to develop a clinical picture of the patient. The tele-practitioner can then use the audiovisual equipment to collaborate with the bedside team to determine the problem and decide on a plan of care. In an ICU where there is intensivist presence, the tele-ICU physician serves in a consultative role, using the preestablished plan of care as a basis for making recommendations. In ICUs without an intensivist, the tele-ICU works in collaboration with the primary physician to develop a plan of care.

Interventions involving the tele-ICU are generally initiated by the tele-ICU and involve a major change in the plan of care (e.g., initiation of vasoactive medication). Many tele-ICUs also use Acute Physiology and Chronic Health Evaluation scoring to inform mortality and length-of-stay measures. This information is shared with tele-ICU, ICU, and organizational leadership and informs effectiveness and improvement initiatives.

A 45-year-old woman was transferred to the ICU after acute respiratory deterioration on the medical-surgical unit. The patient was receiving a sulfa antibiotic for an admission diagnosis of pneumonia. Despite aggressive ventilatory management, the patient’s pulse oxygenation remained between 85% and 88%. Arterial blood gas results were within normal limits; however, on video assessment, the patient had peripheral cyanosis. On the basis of the patient’s presentation, the tele-ICU physician suspected methemoglobinemia. Blood levels of methemoglobin confirmed the diagnosis, and the tele-ICU physician ordered intravenous methylene blue. The sulfa antibiotic was discontinued, because it might have contributed to the abnormal production of methemoglobin. The patient’s oxygenation improved after the second methylene blue dose, and she was able to leave the ICU on 2 L of nasal oxygen the following day.

Information
The tele-ICU provided the resource and knowledge of the intensivist to immediately diagnose and treat the methemoglobinemia noted above; however, the diagnosis depended on the information from the ICU. Transparency of information between the tele-ICU and the ICU is a vital component for developing an appropriate plan of care. Transparency is accomplished through accurate and real-time documentation of clinical events and direct verbal communication between the tele-ICU and the ICU about patients of concern.

In addition to clinical information, knowledge of the operating structure is considered before making a recommendation. Certain rural and critical-access hospitals may not have access to a pharmacy for several hours during the night, requiring the tele-ICU physician to carefully consider the availability of drugs when ordering medications.

Tele-ICU staff collect and analyze data to inform quality metrics. Numerous tele-ICUs share this information in real time, allowing the ICU team to reconcile missing components of best-practice bundles to prevent complications. Many tele-ICUs also use Acute Physiology and Chronic Health Evaluation scoring to inform mortality and length-of-stay measures. This information is shared with tele-ICU, ICU, and organizational leadership and informs effectiveness and improvement initiatives. Oversight of multiple critical care units provides a forum for the tele-ICU to reduce unnecessary variations in care and allows a standardized approach to specific care processes to emerge.

Support
Critical care nursing is stressful. A survey of nurses’ perceptions of first-job experiences revealed that 30% of new-to-practice nurses leave within the first year, and over one-half leave within the first 2 years. Stressful work environments that offered little support and guidance were cited as factors that influenced the nurses’ decision to leave. A recommendation to improve the work environment of nurses included assigning experienced nursing staff to precept new-to-practice nurses to address knowledge and skill gaps. Providing support is difficult in most ICUs as the expert nurses tend to have a full care assignment that includes patients with the most medically complicated conditions. The tele-ICU is staffed with expert nurses who can provide immediate support to guide the decision making of new nurses. Nurses new to the critical care environment can
use the tele-ICU nurse to validate assessment findings, work through critical thinking steps, and assist in planning interventions. Tele-ICU nurses can provide education at the point of care related to medication administration, new equipment, procedures, and algorithms. Availability of the tele-ICU nurse leverages the scarce resources of nurse educators and clinical nurse specialists and provides an expert resource at any time of the day or week.

Methemoglobinemia is a condition in which too much methemoglobin is produced. A type of hemoglobin, oxygen binds to methemoglobin but is not released to meet tissue needs. Methemoglobinemia is an uncommon disorder, making it difficult to anticipate treatment strategies and possible complications. The tele-ICU nurse, with more than 20 years of experience, was able to explain the pathophysiology of methemoglobinemia to the nurse and provide necessary education on the administration of methylene blue; this information allowed the ICU nurse to anticipate the adverse effects of nausea caused by the administration of methylene blue and provide the patient with an antiemetic.

Opportunities for Mobility and Growth

Tele-ICUs provide a unique opportunity for experienced nurses to share their knowledge and expertise that directly affects patient outcomes without the physical and emotional demands of providing bedside care. Although telemedicine was first used more than 4 decades ago, it has only recently experienced greater diffusion into critical care. Evidence that supports this model of care and how it best improves patient safety continues to emerge. Medical and nursing staff from both the tele-ICU and the ICU are afforded opportunities at the local and national levels to communicate the benefits and challenges of using telemedicine to support critical care.

Conclusion

Recognizing the complexity of critical care, the tele-ICU provides an additional layer of support to bedside practitioners and enhances patient safety. Successful integration of this care-delivery model requires nursing leadership skills capable of establishing and maintaining the core elements of an HWE. Tele-ICU/ICU staff share accountability and responsibility for patient care processes and outcomes. Recognition of the value each member of the team brings to ensuring safe care is vital to building relationships that enhance the work environment. The value of telemedicine lies not with the technology itself but in how the technology is interwoven into the daily practice of the multidisciplinary team at the bedside. Skilled communication, true collaboration, and effective decision making will foster the development of relationships that will redesign the delivery of patient care.

REFERENCES


