Interventional Critical Care

A Manual for Advanced Practice Providers

Dennis A. Taylor
Scott P. Sherry
Ronald F. Sing
Editors

Second Edition

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Foreword

Rapid expansion underscores key changes in how – and where – critical care medicine is practiced. Perhaps the most striking change that has occurred is in team composition. Pivotal and anchoring roles for Advanced Practice Providers (APPs) have emerged in daily workflow as well as diagnostic and therapeutic procedures. Ultrasound and endoscopy feature prominently in diagnostic and therapeutic undertakings; both are complemented by fluoroscopy as well. This second edition of *Interventional Critical Care: A Manual for Advanced Practice Providers* offers well-written, succinct, and informative chapters spanning team composition to procedural competency. Clear instruction supplemented by ample high-quality images illustrate essential principles and steps to guide APPs through commonly required critical care procedures. Whether new to practice or well established in a critical care space spanning the emergency department to a general or specialty intensive care unit, this book provides a foundation upon which practice may rest or be expanded. Regardless of the patient type on which your critical care unit focuses, the procedures your patients will require are housed in this comprehensive text. I am certain that the second edition will be a critical tool in the APPs armamentarium in the pursuit of critical care excellence.

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Preface

The goal of the first edition of *Interventional Critical Care – A Manual for Advanced Practice Providers* was to fill a knowledge gap of the advanced practice provider (APP) specifically regarding the skills and understanding of critical care procedures in response to the rapidly expanding participation of APPs in critical care. When we were asked by the publisher to produce a second edition, we paused for period of time to consider what a second edition would contribute that the first edition missed. Moreover, what would we be contributing regarding procedures that are relatively unchanged?

What we learned was actually from feedback by the many physicians, APP providers, *and* especially APP learners who have used the first edition, many in settings outside the ICU: critical care interventions/procedures are not limited to the ICU. Critical care occurs in all areas of healthcare environments, from the emergency department to the floors (i.e., acute events), to the post-anesthesia units, and so on. So, in response, we have eliminated a few non-essential chapters with minimal use and added a number of chapters expanding on more common but necessary procedures used in the critical care setting. In addition to our original model to illustrate the procedures, we've expanded the ultrasonography areas to include more direct hemodynamic evaluations as well as the newer "e"FAST. Furthermore, we've expanded the urology to include more complex interventions. As billing and coding are necessary, we've also added appropriate CPT codes for each of the appropriate chapters. This second edition adds to the content of the first edition and includes new content and chapters that reflect current practice and procedures. Most chapters have been completely re-written and updated from the first edition and have different authors – thereby a different perspective and experience level. The editors and chapter authors of this text were recruited from facilities and programs from across the USA. They all actively practice in the ICU, OR, and ED and are considered content experts in their respective fields. All chapters are authored by an APP and/or physician. Many authors are also designated as fellows of the American College of Critical Care Medicine (FCCM), having made significant contributions to patient care, and the Society of Critical Care Medicine (SCCM). We hope you will enjoy reading and using this text as a reference in your

daily practice in the ICU, OR, and/or ED setting. It has been a pleasure working with all of the chapter authors and contributors. We express our appreciation to Michael D. Sova and Kevin Wright at Springer Publishing for all of their contributions and work on this project.

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Part I

Administrative Considerations

The Multidisciplinary ICU Team

1

Loretta Rock, Larissa Whitney,
and Frederick B. Rogers

Introduction

Since its birth as a specialty, critical care medicine has only been possible through the coordinated efforts of staff from multiple disciplines. During the Copenhagen polio epidemic of 1952, in which hundreds of patients were first able to be maintained on positive pressure ventilation, it became evident that drafting medical students in shifts for 24-h care was a flawed staffing strategy [1]. To address the problem, mechanical ventilators were adapted to routine use, and the ICU ward with dedicated physician staff, one-to-one nursing care, and physiotherapists was soon established [2]. As technical capabilities have improved, and patients survive ever more complex injuries and diseases, the ICU team has expanded to require not just highly trained nurses, respiratory therapists, and physicians but the specialties of critical care pharmacy, perfusion, physical and occupational therapy, nutrition, and social work. Advanced monitoring and support means procedures previously confined to the operating room can be safely performed in the ICU under a team-guided delivery system. Physician assistants and acute care nurse practitioners, together known as advanced practice providers (APPs), have evolved alongside the specialty, and "intensivist APPs" add value as proceduralists, educators, and providers of periprocedural care [3, 4].

The safe and efficient completion of procedures in the ICU requires forethought and interdisciplinary team preparation. Even emergency procedures reliant on "low-frequency, high-stakes" decision-making can be improved by the utilization of crew resource management communication techniques. Learning the fundamentals of teamwork and collaborative care is paramount to the clinical education of successful healthcare providers and strongly endorsed by the World Health Organization. Researchers have found interdisciplinary teams reduce provider burnout, reduce medical errors, and increase patient safety [5].

Nursing

The role of nursing in the constant monitoring and management of critically ill patients was established in the Crimean War through the creation of the first "SICUs" credited to Florence Nightingale, who gathered the most seriously injured close to the nurse's station for care. These predecessors of our modern ICU laid the groundwork for what, in the 1960s and beyond, would become one of the most highly technical areas of nursing [6]. Through the completion of a rigorous board exam, hours-requirements, and continuing education, nurses

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can achieve certification as a Critical Care Registered Nurse [7]. Today's ICU nurses are typically responsible for the minute-to-minute care of hemodynamic and respiratory status of their patients. Their responsibilities on an ICU procedural team mimic those of the circulating OR nurse (in preparation of the patient, verification of consent, and preparation of the environment and instruments), but they are additionally prepared to respond to changes in vital signs, pain, and sedation. ICU nurses are also key in maintaining the complex relationship between patient, provider, and family. As the clinicians logging the highest number of hours at the bedside, they have a unique perspective on the patient as an individual.

Respiratory Therapy and Perfusion

Registered respiratory therapists (RRT/RCP) have a hands-on role in patient recovery from a wide array of pulmonary disease and are considered experts in respiratory care equipment for the healthcare system. Respiratory therapists work closely with anesthesiologists and intensivists to secure the airway, deliver life-saving treatments, and manage ventilators in critically ill patients. The combination of technical application, patient assessment, troubleshooting, and expertise in complex respiratory conditions makes respiratory therapists crucial members of the periprocedural ICU team.

Once strictly a specialty of the operating room, perfusionists are becoming routine ICU staff in facilities equipped to provide extracorporeal membrane oxygenation (ECMO). The Certified Clinical Perfusionist manages circuits, flows, volume status, and blood gas balance of patients on cardiopulmonary bypass. Before, during, and after insertion of ECMO cannulas, the perfusionist provides highly specialized care of patients in life-threatening circumstances [8].

Rehabilitation Therapy

Occupational therapists, physical therapists, speech language pathologists, and physiatrists join the interdisciplinary team in many ICUs as members tasked with close patient contact that emphasizes the transition from critical illness to recovery. Physiatrists, once relegated to the domain of specialized rehabilitation units, now routinely consult on many aspects of the ICU patient's care including pain regimen, mobility, and cognitive therapy. Further, early evaluation of the ICU patient provides that all-important continuity upon discharge to the rehabilitation unit. Multiple studies have demonstrated that early physiatry evaluation in the ICU phase of care improves outcomes.

Occupational therapists assist patients across the lifespan in activities of daily living, rebuilding the confidence and mobility necessary for continued healing. They complete evaluations of the patient's prior to admission environment and develop treatment plans with adaptive equipment recommendations, guidance, and family/caregiver education. Physical therapists work with patients to improve mobility, restore function, limit or prevent permanent physical disability, and improve pain control. They survey a patient's medical history, test patient performance, and develop treatments to prevent loss of mobility in critically ill patients before it occurs.

Speech language pathologists work with patients that are at risk for, or have developed, dysphagia, dysphonia, or cognitive deficits related to language and expression. They regularly diagnose, treat, and provide recommendations for aspiration prevention. Specific to critical care, they are integral in assessing which patients may benefit from PEG tube and facilitating the gradual regain of speech and removal of tracheostomy tube in patients recovering from respiratory failure [9].

Pharmacy

In 2013, an international panel funded by the Agency for Healthcare Research and Quality listed the use of a clinical pharmacist to reduce adverse drug events as one of the "Patient safety strategies ready for adoption now" [10]. Pharmacy specialization in critical care carries a practice requirement along with critical care board certification and maintenance. As clinical pharmacists take an

active role in ICUs during multidisciplinary rounds, care has transitioned from a pharmaceutical focus to a patient-centered focus. Emphasis is placed on patient safety and outcomes. As part of the procedural team, pharmacists will typically be consultants in the choice of sedation, pain control, and antibiotic stewardship.

Medicine

Physicians that complete a specialized Fellowship in Critical Care Medicine following their medical education and residency programs join the interdisciplinary team as the primary intensivist or independent consultant. Intensivist management of critically ill patients has been shown to improve mortality and length of stay, and many ICUs now require this specialist input on all patients. Educational preparation in a medical ICU includes 4 years of medical education, 4–5 years of specialized medical education in pulmonary medicine, and a 1–2-year postgraduate fellowship in critical care medicine. Surgical ICU training includes 4 years of medical education, 6 years of surgical residency program, and a 1–2-year postgraduate fellowship in critical care and/or surgery. Upon completion, the physician must pass and maintain board certification.

Historically, residents and fellows provided much of the direct patient care in ICUs of academic institutions. However, as the demand for critical care staff grows, dependence on advanced practice providers as members of the ICU interdisciplinary team is intensified.

Advanced Practice

Physician assistants (PAs) have been present in modern American medical practice for over 50 years. In 1965, Dr. Eugene Stead developed the first recognized PA training program at Duke University with the goal of expediting training of ex-military medics to work in conjunction with physicians in civilian medical facilities. At present, there are 243 accredited PA programs and upward of 131,000 certified PAs nationwide, with a projected growth of 37% from 2016 to 2026. Training for physician assistants takes approximately 24–28 months to complete and consists of classroom and laboratory time followed by an intensive year of clinical rotations. National certification is obtained via national examination with the option for additional specialty training after graduation via residency and fellowship opportunities.

Physician assistants have been integrated into approximately 25% of adult ICUs in academic hospitals across the United States, as well as a variety of nonacademic hospitals. As part of their comprehensive responsibilities, PAs are at the bedside of critically ill patients obtaining medical histories, conducting physical examinations, ordering and interpreting diagnostic and radiologic studies, diagnosing and treating illnesses, prescribing medications, counseling patients and family members on current and preventive healthcare, performing bedside procedures, and assisting in surgical procedures.

As advanced practice providers, nurse practitioners in the ICU often fulfill an identical role to physician assistants. They have prescriptive authority and, in most critical care environments, procedural privileges. Training as the operator in minor procedures such as central and arterial line placement, chest tube insertion, lumbar puncture, and suturing is standard in most acute care nurse practitioner programs. Additional procedural competency can be achieved through postgraduate training with collaborating physicians or as a separate program to obtain certification as a first assist. Nurse practitioners share responsibility with other team members for ensuring the safe preparation and consent along with periprocedural orders and assessment. They work under the supervision of a collaborating physician and, as they develop mastery, can serve as mentors to medical residents and other trainees.

In ICU teams, APPs are often credentialed for the following procedures:

- Placement of central venous catheters
- Placement of arterial monitoring lines
- Placement and removal of chest tubes
- Thoracentesis
- Paracentesis
- Placement of dialysis catheters

- Placement of pulmonary artery monitoring catheter
- Advanced airway management, including emergent cricothyrotomy
- Complex wound management and debridement
- Bronchoscopy
- Surgical first assistant

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Process Improvement and Patient Safety

2

Shaun A. Paulson and Kyle Cunningham

Introduction

It is impossible to discuss procedures in the intensive care unit without discussing the underlying motivations to deliver advanced care in this location. Many procedures traditionally completed in operative theaters or endoscopy suites are now routinely performed at the bedside. While this may pose some additional planning on the part of the practitioner, it also poses potential benefits for the patient and the institution.

Operating room time is expensive and limited in availability at many hospitals. In addition, staff from multiple departments may be impacted. Nursing and respiratory therapy will be needed to transport the patient. Nursing and anesthesia will be needed to provide care during the perioperative period. Surgical technologists are needed to prepare and manage equipment during the case. Following the case, environmental services will be needed to clean the room and prepare for the next case. Often, extubated patients will need to be recovered in the post-anesthesia care unit by additional nursing staff and anesthesiologists. These required resources come at a premium that can quickly tally in the tens of thousands of dollars.

By performing procedures in the intensive care unit, the need for costly operating rooms or endoscopy suites may be eliminated, thereby reducing the number of staff involved which in turn produces a savings to the patient.

Although it may seem to benefit the institution by providing these surgical services through the operating room, it is actually collectively more beneficial to keep procedures in the least expensive location. By eliminating relatively short cases or procedures, potentially longer cases with decreased downtime can be completed. Additionally, it opens up operating room time for elective procedures that would otherwise be forced to competing institutions or, worse yet, leave patients untreated.

The greatest benefits of performing procedures in the intensive care unit remain the direct benefits to the patient. Each time the patient is moved, there is an associated handoff of care, which creates the potential for missed information or communicate lapses. By staying in the unit, the patient is not subject to high-risk transfers when in critical condition which could lead to a more timely and overall improved outcome.

Intensive care unit-based procedures present a two-pronged approach to improving value. Firstly, a better product is delivered by offering the patient a service in their own intensive care unit room. Procedures are performed by team members par-

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ticipating in the daily care of the patient and with comprehensive knowledge of the patient's health conditions. Secondly, costs are reduced by eliminating expensive resources such as specialized staff and facility space. As illustrated in the value equation, the coupling of the aforementioned approaches improves the quality of the service offered as well as the value of the services provided to the patient. Bundled payments and population-based healthcare are growing in popularity and mandate that institutions work to provide an increased value. "A dollar saved is a dollar earned" has never been more true.

So how should this strategy be implemented and procedures brought to the bedside? With the complete buy-in and a tone voiced by institutional leadership, it will take a team comprised of both executives and bedside team members. In this chapter, we will take an in-depth look at what it takes to ensure patient safety through process improvement initiatives such as process improvement (PI) committees, quality assurance (QA), and methodologies.

Process Improvement/Quality Assurance

Hospital Committee Enhancement in Patient Safety

Much of medicine is hands on and performed at the patients' bedside. The hands-on approach and validation of skills are important and necessary for safely performing bedside procedures; however, developing a system for review is just as essential if not more so. Many medical clinicians have turned to examples used in business to help influence systemic change in the medical field. Business create models that are used in the development of strategies with the intent of ensuring the quality of the goods and/or services offered, as well as improving the management of multidisciplinary work [1]. Incorporating the approaches used in the business development of strategies into the practice of medicine has translated into change that is proven to improve clinical process and patient safety at the bedside.

One suggested process for enhancing patient safety is the establishment of a PI committee. Having a committee is important to healthcare today as the focus is placed on improving quality of care, measuring goals, and establishing a reporting system. A PI committee should be comprised of executives as well as various members of the healthcare team including physicians, advanced practice providers (APP), nursing, respiratory therapists, and clinical nurse leaders. The PI committee ideally would meet monthly to discuss process discovery, process optimization, and process implementations as outlined in the following paragraphs.

Once a committee has been developed, additional questions may then arise: where to start, how to select the correct process, and how to measure success out of a PI project? In adapting a business model to the medical model, the attention should be shifted to the three Ps for continuous process improvement: process discovery, process optimization, and process implementation. The three Ps should form the base of any process improvement effort [2]. The following should be considered while defining the foundation for the improvement effort:

1. Which critical processes/problem could be positively impacted by a well-defined and streamlined process?
2. What will the improved process add to the safety of your patients and staff?
3. What will be required to implement the improvement?

Once an understanding of the foundation for the improvement efforts is established, the next step is to create a plan for the process improvement initiative by following the three Ps [2, 3]:

1. Process discovery: Developing a reporting system for the system to anonymously report incidents that the committee is able to review will be the first step in discovery. Next, selecting the project can be an intimidating process in itself. Always keep the bigger picture in mind and think about what process will have the greatest impact.

2. Process optimization: Once the process to be improved is identified, the next step is to think about how to optimize the process, i.e., establishing goals, defining the scope of practice, and development of a subcommittee.
   (a) Setting goals for the process is crucial. The goals need to be measurable. In healthcare, if it cannot be measured, then it cannot be improved [3]. Some common themed goals for healthcare are to reduce and/or eliminate unexplained or inappropriate variation in care, promote multiprofessional education of process improvement initiative, monitor compliance of guidelines, and improve patient care, patient safety, and clinical efficacy through structured process improvement initiatives.
   (b) Define the scope of the project. Develop a clear and concise written statement that relays the purpose of the project.
   (c) Develop a subcommittee to manage the project: The committee should consist of a representative from each discipline that the project involves.
3. Process implementation: Upon completion of discovery and optimization, the next step is the implementation stage. Every member of the team including members who will use the process on a daily basis is involved during implementation. PI does not stop with implementation; it is a continuous process. The final step in the initiation is the development of an evaluation tool for the solution. By doing so, it will help to determine if previously established improvement goals have been met.

With any process improvement initiative, there must be continuous evaluation as perfection cannot be maintained without ongoing monitoring and the implementation of best practices. Once improvements have been implemented into the plan, the process repeats itself with each implementation of approved adjustments.

Now that a process improvement initiative has been developed, it is vital to the success to track quality of care and outcomes by developing a quality assurance program.

Methodologies

Methodologies are often derived from the process improvement initiatives. They are enhancement to ensure patient safety. Some key methodologies that support the structure of enhanced patient care and safety are simulation labs, the "time-out" patient handoff, and evidenced-based protocols/guidelines. In the following section, we will discuss each methodology.

Simulation

The Institute of Medicine (IOM) report titled "To Err is Human" brought attention to the unsettling issue of medical errors, leading to deaths in 1999. It was estimated that each year, 45,000–98,000 patients die in the United States as a result of medical error [4]. As a result of the staggering numbers being reported, the report called for a system change. The Agency for Healthcare Research and Quality (AHRQ) implemented broad and diverse initiatives including funding for simulation research with the understanding that simulation can complement other organizational change methods to facilitate adoption and implementation of best practices and technologies. The research which spanned 11 years evaluated the effectiveness of simulation and demonstrated improved outcomes in patient care [5].

Simulation is defined as a strategy or technique to mirror or amplify real clinical situations with guided experiences in an interactive fashion [6, 7]. Simulation training is an essential part of training for procedures as it serves as a podium which provides a valuable tool in learning to alleviate ethical tensions and resolve practical dilemmas. The goal behind simulation is to deliver realistic scenarios and provide equipment to allow for training until one can master the procedure or skill. There are four main methods of simulation: human patient simulators, task trainers, standardized/simulated patients, and virtual reality [6–8].

1. Human patient simulators are mannequins designed to provide an accurate anatomic rep-

resentation of a patient. They can display physiologic signs and physical cues and can be remotely controlled by an operator through the use of a computer control module or a remote. They allow learners to practice a variety of medical procedures including airway maneuvers, i.e., intubations, bronchoscopy, bag-valve-mask ventilation, needle cricothyroidotomy, forms of vascular access, and life support procedures such as cardioversion and defibrillation.
2. Task trainers are partial body simulators that are used for training in specific tasks and/or procedural skills.
3. Standardized, or simulated, patients are real people who are recruited and trained to portray patients in a reliable and consistent manner.
4. Virtual reality simulators use a computer screen to create simulated patients and patient care environments. The interactions that take place are virtual in that the learner interacts with the patient utilizing a computer interface in an electronically rendered environment, rather than a physical simulator.

The Time-Out

Communication failures have been a long-standing threat to patient safety and are often the most frequently cited cause of adverse events. Strategies have been adapted uniformly to improve communication in both the procedural and nonprocedural settings. In 2003, the Joint Commission elevated the concerns for wrong-site surgery by making its prevention a National Patient Safety Goal and the following year required compliance with a Universal Protocol [9]. The Joint Commission went a step further by not only requiring the site to be marked but a "time-out" (TO) to be performed. A TO requires communication among all team members. It allows members of the team to discuss the plan and any concerns he or she may have [10].

Patient Handoff (GAPS)

Hospitals function 24 h a day, 365 days a year; therefore, no practitioner can feasibly stay in the hospital around the clock. Patients will inevitably be cared for by many different providers during hospitalization. The discontinuity in clinical care can cause errors in the game of "telephone" if information is not passed on correctly. Thus, direct communication via verbal or written handoff tools is essential for patient safety following procedures. The process for which the care of a patient is transferred from one provider to the next is called "handoff." The act of relaying information regarding patients from one provider to the next is called "sign-out" [9].

Following a procedure, a postoperative note documenting the procedure with findings and events is important in communicating to all members of the team. The postoperative period begins at the cessation of a procedure. A system-based approach to postoperative assessment is to be performed to recognize complications early and appropriately act upon. Without accurate documentation and precise sign-out during the handoff process, complication can be missed, leading to a detrimental outcome for the patient.

Protocols

Much of today's medicine has been protocolized. Why, you ask? Patient safety is the number one reason. PI initiatives have identified areas of risk, and through the process and research, best practices have been developed. Protocols are roadmaps that allow practitioners to deliver evidence-based medicine to patients in a safe and effective way.

Just Community Initiatives

It is worth noting that an outcomes-based approach will miss a significant number of structure and process issues. An emerging approach to

process improvement and quality assurance analyzes events independent of outcome. The principles of Just Community maintain that identical events should be scrutinized independent of outcome, separating failures into three categories:

1. Error in judgment
2. At-risk behavior
3. Reckless behavior

Each category will require a different approach. Punishing providers for mistakes impedes process improvement and blurs transparency. The Just Community approach embraces this philosophy and provides a framework for implementation [11].

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The Administrative Process

3

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Introduction

Credentialing and privileging are fundamental mechanisms employed by healthcare facilities to ensure that only qualified, competent healthcare professionals are granted access to patients and authorized to practice medicine. The administrative steps necessary to ensure that nurse practitioners and physician assistants (referred to hereafter as advanced practice providers (APPs)) are properly credentialed and privileged to practice medicine and perform invasive procedures can appear onerous at first glance. The purpose of this chapter is to digest these requirements into their key elements and equip the APP or administrator with the accepted terminology and knowledge necessary to successfully comply with the requirements of the various regulatory and accrediting bodies.

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The terms privileging and credentialing are often incorrectly interchanged. They are two separate and distinct processes; both of which are key to establishing the qualifications and competency of a medical provider prior to a clinical appointment within a healthcare organization. Credentialing is the formal process of vetting a provider prior to medical practice, while privileging is the formalized process of authorizing a healthcare provider's scope of practice once the credentialing process has been successfully completed. Credentialing consists of collecting, assessing, and verifying all the candidate's qualifications or credentials to determine if the minimum requirements for practice are satisfied. Much of the requisite documentation is standardized by external regulatory agencies, but individual institutions may establish requirements that exceed the minimum standard. It is imperative that the APP and institution are familiar with the requirements specific to their state and practice.

The privileging process is internal and governed by practice administration and medical staff bylaws. The prevailing principle is to establish a competency standard and apply this standard equally to all providers requesting permission to practice at the facility. During the privileging process, documentation of a candidate's competency is again evaluated through the collection, verification, and assessment of supporting documentation. Once completed, the privileging status of all pro-

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viders is to be readily accessible by all hospital staff. This serves as an added safety measure to ensure that healthcare providers practice within their authorized scope of practice.

The chapter concludes with a discussion outlining the key concepts of maintenance of certification (MOC). Certification and licensure can be granted by a state and/or national body depending on the profession. Certification and licensure are typically applied for after successful completion of academic and clinical training and granted upon the successful completion of formal standardized examinations assessing the candidate's competency of medical, ethical, and regulatory knowledge. Certification and licensure are required before initial credentialing and privileging and in most states have a maintenance period of two years with varying criteria based on state and profession. We will discuss the MOC typical to the APP practice with the understanding that the requirements may vary from state to state.

Credentialing

The history of regulatory agencies in the United States dates back to 1917 when the American College of Surgeons (ACS) created a one-page guide titled "Minimum Standard for Hospitals" with the purpose of measuring patient satisfaction. A year later, the ACS looked at 692 hospitals, and a mere 89 of them met the minimum standard. This evolved into the ACS developing the first "Minimum Standard" manual in 1926; a total of 18 pages. In 1951, the American College of Physicians, the American Medical Association, and the Canadian Medical Association joined the ACS to create The Joint Commission on Accreditation of Hospitals. Additionally, the Centers for Medicare and Medicaid Services (CMS) now publishes specific "Conditions of Participation" (CoP) with which healthcare organizations must comply in order to participate in the Medicaid and Medicare programs [1].

Collecting and vetting the qualifications of an APP are required by The Joint Commission. The goals of vetting include patient protection, risk management and avoidance of legal liabilities such as claims of negligence, compliance with regulatory and accrediting agencies, and protecting the reputation of the organization.

In 2007, The Joint Commission (HR.1.20) renewed focus on verifying qualifications of APPs and established the expectation that physician assistants and nurse practitioners must be credentialed through medical staff offices. Standards set by The Joint Commission require that all APPs entering a facility must be vetted by the same body, ensuring equitable opportunity and scope of practice in the same facility.

In addition to The Joint Commission standards, many states require collaborative or supervisory agreements between APPs and physician colleagues. These requirements can vary from PA to NP profession and from state to state. It is important for APPs and hospital administrators to be current and knowledgeable of the established requirements. These requirements can typically be found on the state medical or nursing board website.

Each provider practices under accepted medical staff bylaws approved at the hospital or practice level. These bylaws establish the minimum credentialing criteria and ensure compliance with state and federal regulations of practice. They describe the duties, rules, and regulations, hearing and appeals processes, as well as policies and procedures for all provider practice and allied health caregivers. The hospital is responsible for outlining its credentialing process in its bylaws.

The APP may also be referred to in some hospital systems as an "allied health practitioner" or AHP, meaning an individual other than a physician (excluding dentist, oral and maxillofacial surgeon, podiatrist, or psychologist) who is qualified by academic and clinical training and by prior and continuing experience and current competence in a discipline which the AHP Review Committee has determined to allow to practice in the hospital" [2].

The Joint Commission standards require the hospital to obtain primary verification in writing the qualifications of skills and clinical knowledge. Primary sources may include the certifying boards, letters from professional schools, and let-

ters from specific training programs. When reviewing the information presented for credentialing, the medical staff office will ensure that the current or previous licenses or certifications have never been challenged or in question. Further evaluation will be made in the event of voluntary or involuntary relinquishment of licenses or certifications. These efforts evaluate for current liability or patterns suggesting an increased risk of future liability.

Insurance is usually covered by a supervising or collaborative physician to the APP. Requisites are the APP's name, limits of liability, and effective dates with expiration. Hospitals should automatically suspend APPs who do not provide proof of current coverage.

Once the medical staff office has collected and vetted all of the required qualifications, they then must present the information in its entirety to a committee, specific to the credentialing and privileging of the APP. The four steps to final approval are department chair's review, credentialing committee's review, medical executive committee's review, and governing board's review and final decision. In the event of an unfavorable decision among the credentials committee and board, the medical staff office will want to consult with their legal counsel to discuss the appropriate steps to accommodate proper legal requirements. Denial of privileges entitles the APP the rights to a hearing.

An APP applying for privileging and credentialing to a hospital has the responsibility of providing all documentation to fulfill the criteria requested. The medical staff office may close the request for credentialing if the information has not been presented in completion. If this occurs, the hospital would then send a letter to the applicant explaining the discontinuance of the process.

Privileging

Although the terms credentialing and privileging are often used together and sometimes interchangeably, they are two distinct processes. The Joint Commission defines privileging as "the process whereby a specific scope and content of patient care services (i.e., clinical privileges) are authorized for a healthcare practitioner by a healthcare organization, based on an evaluation of the individual's credentials and performance." A "privilege" is defined as an advantage, right, or benefit that is not available to everyone; the rights and advantages enjoyed by a relatively small group of people, usually as a result [3] of education and experience." Privileges are usually granted by an institutional medical staff committee.

Privileges can be further separated into "bundled/core" or "special" privileges. The core privileges represent the everyday activities that a competent APP should be able to perform based on their general education and training, such as history taking, performing physical exams, and interpreting laboratory tests. Special privileges are for procedures that are either performed infrequently, carry greater risk of complications, or both. For APPs, this category usually includes procedures that are learned on the job as opposed to in school. As this is a textbook for interventional critical care, many of the procedures addressed in this text will fall into the "special" category, requiring separate privileging. One might assume that the definition of "core" and "special" is standardized across institutions, but studies have found wide disparity between what individual institutions consider core or special [4]. It is the responsibility of the APP to know which procedures his or her institution considers "special" and to apply for those specific procedural privileges as appropriate.

Privileging takes place at three distinct times: during initial application to the medical staff of a healthcare institution, during routine re-credentialing/re-privileging process (typically every two years), and when an APP wishes to request new privileges or a set of core privileges. There are many resources that address processes for requesting initial core privileges and core re-privileging. As this is a procedural text, the focus here will be on special procedure privileging.

Institutions are free to set their own standards for initial privileging for special procedures. However, most institutions will request either an activity record demonstrating sufficient practice in the requested procedure, an attestation from a

competent supervisor or preceptor stating the applicant's competency in the requested procedure, or both. No standard exists as to how many procedures are satisfactory, but many institutions set a bar at three to five in the prior two years.

Once a privilege for a special procedure is granted, the APP will need to re-privilege, typically every two years. For many years, most institutions considered a log or other proof of activity sufficient for re-privileging. But emerging evidence suggests that such logs may not be sufficient to demonstrate competence, proficiency, or breadth of experience [5]. In short, performing a procedure often, but poorly, is not an adequate demonstration of skill. Therefore, some institutions are migrating away from re-privileging based purely on volume and are incorporating additional objective evaluations of proficiency. This may take the form of a peer evaluation, review of outcomes, or evaluation in a simulation/under direct observation.

The other opportunity for requesting special procedure privileges is when the APP is learning a new procedure. In the current regulatory environment, the old adage of "see one, do one, teach one" is no longer sufficient. A dilemma exists, however: the institution will not allow an APP without a privilege for a procedure to perform the procedure, but the APP cannot gain the privilege without demonstrating proficiency at the procedure. To resolve this dilemma, many institutions have developed specific requirements to obtain new procedure privileges. These may begin with a formal didactic curriculum and then may move on to incorporate simulation and observation of the procedure. There is evidence that simulation can enhance skill and confidence with new procedures and should be utilized whenever available [6].

At some point, the APP must be able to demonstrate proficiency in the procedure with an actual patient. There are two components to this. Precepting involves a clinician with proficiency in the procedure teaching the APP how to perform it. The preceptor has an existing relationship with the patient, is responsible for the outcome, will document the procedure, and will submit any billing. Once the APP has learned the procedure, he or she can then be proctored. A proctor is a neutral clinician who holds the privilege being demonstrated, does not have an existing relationship with the patient, and does not assume responsibility for the patient outcome. In this circumstance, the APP documents the procedure (acknowledging the presence of the proctor) and submits any billing. The proctor records his or her observations, which are then submitted with the privileging request. This proctoring relationship requires a formal plan that outlines what is to be proctored, what criteria will be used for evaluation, and how/to whom the final assessment will be submitted. Once the APP has met the conditions specified in the proctoring agreement, the APP may then submit a request for privileges in the new procedure through the medical staff.

APPs are subject to state and federal rules that may restrict what procedures are performed and in what circumstances. Advanced practice registered nurses and physician assistants may have different privileging requirements, and procedures may be considered "core" for one group and "special" for another. Therefore, it is the responsibility of the APP to ensure he or she is appropriately privileged before performing any procedure.

Maintenance of Certification

Maintenance of certification (MOC) provides an expectation that the APP will engage in certain activities to maintain clinical competency allowing governing bodies and hospital systems to verify the status of their APPs.

In some circumstances, APPs may be required to retest on a cycle to maintain certification. For example, both physician assistants (PAs) and advanced practice registered nurses (APRNs) must pass an initial credentialing examination after completion of their respective training programs. Licensure is then maintained every two years with proof of continued medial education.