

# Successfully Navigating the First Year of Surgical Residency:

Essentials for  
Medical Students  
and PGY-1 Residents

American College of Surgeons  
Division of Education



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## ◆ ACKNOWLEDGMENT ◆

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A large, blue, stylized letter 'W' graphic that serves as the first letter of the word 'We' in the opening sentence. The 'W' is composed of thick, rounded strokes and is positioned at the top left of the page, partially overlapping the 'FOREWORD' header.

We would like to welcome you to the profession of surgery, with its many exciting opportunities. Mastery of surgery requires a solid foundation of knowledge and skills. This publication, **“Successfully Navigating the First Year of Surgical Residency: Essentials for Medical Students and PGY-1 Residents,”** lists the critical cognitive, clinical, and technical skills needed to build such a foundation. The document is designed to lay the groundwork for education and training in all surgical specialties and includes contemporary topics in surgery within the context of the six core competencies identified by the Accreditation Council for Graduate Medical Education as essential for all residents. Heavy emphasis has been placed on patient safety issues throughout the document.

The new “Essentials” publication is composed of two parts. The first part specifically addresses the essential areas of knowledge and skills that surgical residents should possess at the beginning of the first year of residency education. The second part lists the essential areas of knowledge and skills expected of residents at the completion of the first year. Definition of the knowledge and skills at these two critical junctures in the early education of residents should be helpful to medical students interested in surgery, surgical residents, and residency program directors. Medical students may want to use this document as an educational guide to prepare for entry into surgery residency programs. Residents may use this resource to define the knowledge and skills that they need to acquire over the course of the first year. Program directors may use this document as a blueprint for a competency-based curriculum for the first year of residency education and to help residents with various learning activities.

This publication represents the revised version of the previous American College of Surgeons' publication, "Prerequisites for Graduate Surgical Education: A Guide for Medical Students and PGY-1 Surgical Residents," which has remained popular since it was published several years ago. Under the stellar leadership of Toni M. Ganzel, MD, MBA, FACS, and Myriam J. Curet, MD, FACS, the Editorial Board of "Essentials" has done a spectacular job to create a very valuable educational resource. Vital input has been provided by the Committee on Resident Education of the American College of Surgeons, representatives from the Residency Review Committee–Surgery, the Association of Program Directors in Surgery, and the various surgical specialties.

I would like to express my sincere gratitude to all of the individuals involved with the creation of "Essentials." They have volunteered enormous amounts of their time and have generously shared their expertise to make this an outstanding educational resource. I would also like to gratefully acknowledge the support for this project from a grant from the Agency for Healthcare Research and Quality, U18 HS12021.

We hope you will find this publication helpful as you pursue your education and training in surgery, and we wish you the very best in your career ahead.



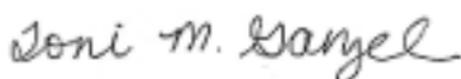
Ajit K. Sachdeva, MD, FACS, FRCSC  
Director, Division of Education  
American College of Surgeons



Congratulations on choosing a surgical career! We are confident that you will find the profession of surgery professionally and personally rewarding and that you will be pleased with the decision you made.

This document, **“Successfully Navigating the First Year of Surgical Residency: Essentials for Medical Students and PGY-1 Residents,”** is the culmination of several years of work by more than 100 surgeons whose goal was to help surgical residents be better prepared for the challenges they face during their first year. Based on feedback from students, surgical residents, and program directors regarding the original version titled “Prerequisites for Graduate Surgical Education: A Guide for Medical Students and PGY-1 Surgical Residents,” a number of changes were made to make this new document more useful. First, it has been streamlined by paring down existing items and including only those considered essential. Second, it has been updated by adding areas related to contemporary topics such as patient safety and the core competencies defined by the Accreditation Council for Graduate Medical Education (ACGME)—medical knowledge, patient care, professionalism, interpersonal and communication skills, practice-based learning and improvement, and systems-based practice. Finally, it has been reformatted to be more user friendly.

We hope you will use the new “Essentials” as an educational tool to guide your learning during your last year of medical school as well as during your first year of residency training, and that, as a result, you will be better prepared for the exciting road ahead.



Toni M. Ganzel, MD, FACS  
Immediate Past Chair  
Committee on Resident Education



Myriam J. Curet, MD, FACS  
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# Essentials for Surgical Residents Entering PGY-1

## Essentials for Surgical Residents Entering PGY-1

Surgical residents entering the first postgraduate year are expected to be well grounded in the scientific basis of surgical diseases and disorders and should be able to apply their knowledge and skills to provide optimum patient care and ensure patient safety. The essential areas of knowledge and skills for entering PGY-1 surgical residents are listed here within the context of the core competencies: Medical Knowledge and Patient Care, Professionalism, Interpersonal and Communication Skills, Practice-Based Learning and Improvement, and Systems-Based Practice.

# Medical Knowledge and Patient Care

## Clinical Assessment and Perioperative Management

- ◆ Effectively and efficiently perform a history and a physical examination that is appropriate for age, sex, and clinical problem
- ◆ Identify factors that increase perioperative risk
  - ◆ Diseases:
    - ◆ *Cardiac*
    - ◆ *Endocrine*
    - ◆ *Hepatic*
    - ◆ *Infectious*
    - ◆ *Psychiatric*
    - ◆ *Pulmonary*
    - ◆ *Renal*
  - ◆ Conditions:
    - ◆ *Extremes of age*
    - ◆ *Immune suppression*
    - ◆ *Metabolic disorders*
    - ◆ *Pregnancy*
    - ◆ *Substance abuse*
- ◆ Develop appropriate differential diagnoses and management plans
- ◆ Write daily inpatient notes in an appropriate format, noting progress and changes in health status
- ◆ Write concise clinic encounter notes in an appropriate format
- ◆ Write routine orders
  - ◆ Admission
  - ◆ Preoperative
  - ◆ Postoperative
- ◆ Maintain medical records in a legible, legally appropriate professional manner
- ◆ Consider the possibility of pregnancy in women of childbearing age and discuss the special needs and concerns of surgical patients who are pregnant or may be pregnant
- ◆ Discuss the impact of extremes of age on diagnosis and management of the surgical patient

## Assessment of Basic Diagnostic Tests and Radiographs

- ◆ Interpret normal and abnormal biochemical and hematologic laboratory test results
- ◆ Interpret normal and common abnormal findings in radiographs of:
  - ◆ Abdomen
  - ◆ Chest
  - ◆ Skeleton
- ◆ Interpret a standard 12-lead electrocardiogram and identify common abnormalities

## Nutrition

- ◆ Assess nutritional status
- ◆ Describe nutritional requirements in health and disease
- ◆ Describe the risks, and benefits of enteral and parenteral nutrition

## Airway Management and Anesthesia

- ◆ Obtain Advanced Cardiovascular Life Support certification, including:
  - ◆ Assessing the adequacy of the airway
  - ◆ Obtaining oropharyngeal control of the airway and providing bag/mask ventilation (simulated)
  - ◆ Performing orotracheal intubation (simulated)
- ◆ Describe the actions, risks, and optimum use of local and general anesthetic agents

## Management of Fluid/Electrolytes and Acid/Base Balance

- ◆ Calculate routine maintenance fluid requirements appropriate for age and clinical problem, and write orders for them
- ◆ Write orders for appropriate monitoring, and calculate intake and output
- ◆ Make changes in maintenance fluid and electrolyte orders based on biochemical and clinical assessment
- ◆ Calculate and interpret acid/base balance
  - ◆ Anion gap
  - ◆ Arterial blood gases

## Fever and Surgical Infections

- ◆ Describe the pathophysiology and common causes of fever in the surgical patient
- ◆ Identify the common postoperative infections
- ◆ Describe the evaluation of a patient with postoperative fever, including appropriate use of physical examination, cultures, and other diagnostic tests
- ◆ Describe the systemic inflammatory response syndrome and associated findings
- ◆ Discuss common pathogens in surgical wounds
- ◆ Describe the principles of surgical treatment of infection

## Wound Management

- ◆ List wound classifications
- ◆ Describe the phases of normal wound healing, including the major cell types involved (platelets, polymorphonuclear leukocytes [PMNs], macrophages, and fibroblasts) and the timing of each phase and the maximum strength of a wound
- ◆ Describe the principles of tetanus prophylaxis
- ◆ Perform simple wound debridement under supervision
- ◆ Perform dressing changes for sterile and contaminated wounds

## Shock and Critical Care

- ◆ List the types of shock
  - ◆ Describe clinical findings of each
  - ◆ Outline principles of management of each
- ◆ List the indications for and risks of a red cell transfusion
- ◆ Identify the physical findings of abnormal intravascular volume

## Trauma and Surgical Emergencies

- ◆ Discuss the primary survey of the trauma patient, including the ABCs
- ◆ Control bleeding from external wounds
- ◆ Correctly identify clinical and radiologic findings in common fractures
- ◆ Describe the findings and appropriate treatment of:
  - ◆ Airway compromise
  - ◆ Pericardial tamponade
  - ◆ Tension pneumothorax
- ◆ Describe the estimation of total body surface area burn in thermal injury
- ◆ Describe initial fluid resuscitation in thermal injury

## Stroke and Transient Ischemic Attack

- ◆ Describe the clinical manifestations of:
  - ◆ Hemorrhagic stroke
  - ◆ Ischemic stroke
  - ◆ Transient ischemic attack (TIA)

## Coagulation and Anticoagulation

- ◆ Discuss the coagulation cascade
- ◆ List a differential diagnosis of coagulopathies according to history and laboratory tests
- ◆ Discuss prevention of deep vein thrombosis (DVT) and pulmonary embolism
- ◆ Describe signs of acute DVT
- ◆ List drug regimens for therapeutic anticoagulation
- ◆ List indications and contraindications of anticoagulation
- ◆ Recognize chronic venous insufficiency and its implications

## Pharmacology and Pharmacokinetics

- ◆ Discuss basic pharmacology of common drugs:
  - ◆ Analgesics
  - ◆ Antibiotics
  - ◆ Anticoagulants
  - ◆ Antiemetics
  - ◆ Antihypertensives
  - ◆ Antiplatelet agents
  - ◆ Corticosteroids
  - ◆ Diuretics
  - ◆ Gastric acid-reducing drugs
  - ◆ Laxatives
  - ◆ Nonsteroidal antiinflammatory drugs (NSAIDs)
  - ◆ Oral hypoglycemic agents
  - ◆ Sedatives
- ◆ Discuss age- and metabolic-specific implications of drug dosing

## Complications and Conditions in Surgical Patients

- ◆ Identify and outline age-appropriate initial evaluation of the following:
  - ◆ Abdominal distention
  - ◆ Acute abdomen
  - ◆ Acute alcohol intoxication
  - ◆ Alcohol or drug withdrawal
  - ◆ Altered mental status
  - ◆ Arterial bleeding
  - ◆ Aspiration
  - ◆ Aspiration pneumonia
  - ◆ Atelectasis
  - ◆ Bleeding and coagulopathy
  - ◆ Bowel obstruction
  - ◆ Chest pain
  - ◆ Congestive heart failure
  - ◆ Constipation
  - ◆ Cyanosis
  - ◆ Deep vein thrombosis
  - ◆ Diabetic ketoacidosis
  - ◆ Dyspnea
  - ◆ Dysrhythmias (as covered in Advanced Cardiovascular Life Support)
  - ◆ Fecal impaction
  - ◆ Fever
  - ◆ Gastrointestinal bleeding
    - ◆ *Lower*
    - ◆ *Upper*
  - ◆ Hemothorax
  - ◆ Hyperosmolar coma
  - ◆ Hypertension

- ◆ Hyperventilation
- ◆ Hypotension
- ◆ Hypoventilation
- ◆ Hypovolemia
- ◆ Hypoxia
- ◆ Jaundice
- ◆ Malignancies  
(common; eg, breast, colon, lung)
- ◆ Nausea
- ◆ Oliguria
- ◆ Peripheral ischemia
  - ◆ *Acute*
  - ◆ *Chronic*
- ◆ Peritonitis
  - ◆ *Generalized*
  - ◆ *Localized*
- ◆ Phlebitis, superficial
- ◆ Pleural effusion
- ◆ Pneumonia
- ◆ Pneumothorax
- ◆ Postoperative pain
- ◆ Pulmonary edema
- ◆ Pulmonary embolus
- ◆ Seizures
- ◆ Substance abuse
- ◆ Transfusion reaction
- ◆ Urinary retention
- ◆ Vomiting
- ◆ Wound hematoma or seroma

## Surgical and Technical Skills

- ◆ Practice universal precautions routinely
- ◆ Administer a local anesthetic
- ◆ Insert and maintain nasogastric tubes
- ◆ Insert and maintain urinary catheters
- ◆ Assess the presence of peripheral blood flow using handheld Doppler instruments
- ◆ Perform venipuncture and insert peripheral intravenous catheters
- ◆ Perform an arterial stick and obtain an arterial sample
- ◆ Scrub, gown, and glove properly
- ◆ Maintain appropriate sterile technique in the:
  - ◆ Clinic
  - ◆ Emergency department
  - ◆ Intensive care unit
  - ◆ Operating room
  - ◆ Patient's room
- ◆ Use proper techniques for skin preparation and draping of the incision site
- ◆ Remove sutures and staples
- ◆ Perform minor surgical procedures under supervision; eg,
  - ◆ Incision and drainage of superficial abscesses
  - ◆ Minor excisions
  - ◆ Skin suture using simple, subcutaneous, and mattress sutures as well as staples
- ◆ Understand potential complications of the above procedures as they relate to patient safety

## Professionalism

- ◆ Adhere to the local institutional code of conduct, demeanor, behavior, and attire
- ◆ Demonstrate altruism in patient care
- ◆ Respect all individuals
- ◆ Use discretion in private and public communications
- ◆ Maintain an inquisitive mind and lifelong learning habits
- ◆ Demonstrate an awareness of one's own limitations
- ◆ Accept feedback appropriately and use it effectively for self-learning and improvement
- ◆ Demonstrate self-directed learning skills
- ◆ Know when and where to obtain help for professional and personal issues
- ◆ Describe the principles of informed consent
- ◆ Describe the basic principles of medical ethics:
  - ◆ Beneficence
  - ◆ Patient autonomy
- ◆ Be illegal/illicit substance free
- ◆ Use time management skills appropriately in order to balance one's personal and professional responsibilities
- ◆ Demonstrate a strong work ethic, and consistently and dependably carry out one's duties with honesty, personal integrity, self-motivation, and self-discipline
- ◆ Work collaboratively with other members of the health care team
- ◆ Accept responsibility for one's actions
- ◆ Be punctual
- ◆ Attend required conferences

## *Interpersonal and Communication Skills*

- ◆ Listen actively with cultural, ethnic, gender, racial, and religious sensitivity
- ◆ Communicate effectively with patients, families, and professional associates
- ◆ Begin patient encounters, educate and advise patients, and end encounters, conveying sensitivity, compassion, and concern
- ◆ Discuss medical errors or professional mistakes honestly and openly in ways that promote learning
- ◆ Convey key information accurately to the transition team assuming care
- ◆ Appreciate and be able to discuss sensitive issues with patients, including:
  - ◆ Death and dying
  - ◆ Health maintenance and disease prevention
  - ◆ Substance abuse
- ◆ Give accurate, clear, and concise oral presentations

## *Practice-Based Learning and Improvement*

- ◆ Demonstrate self-directed and lifelong learning skills
- ◆ Demonstrate the ability to access, analyze, and use the scientific literature
- ◆ Describe the principles of evidence-based practice
- ◆ Be proficient with computer applications; eg, word-processing programs, spreadsheets, simple databases, and electronic presentations
- ◆ Use electronically available medical information in patient care

## Systems-Based Practice

- ◆ Identify barriers to access to health care
- ◆ Use the medical record appropriately
- ◆ Describe the principles of patient safety and patient safety practices, such as Joint Commission on Accreditation of Healthcare Organizations (JCAHO) patient safety standards; eg,
  - ◆ Improving the accuracy of patient identification
  - ◆ Improving the effectiveness of communication among caregivers
  - ◆ Improving the safety of using high-alert medications
  - ◆ Eliminating wrong-site, wrong-patient, wrong-procedure surgery
    - ◆ *Using a time-out in operative procedures*
  - ◆ Improving the effectiveness of clinical alarm systems
  - ◆ Reducing the risk of health care–acquired infections
  - ◆ Describing the roles of various health professionals in the patient care team

- ◆ Comply with Health Insurance Portability and Accountability Act of 1996 (HIPAA) regulations regarding patient privacy and confidentiality
- ◆ Understand the concept of risk management and the need for appropriate documentation in the medical record
- ◆ Use electronically available medical information effectively
- ◆ Demonstrate collegiality in working with all of those associated with the care of patients
- ◆ Apply information technology effectively to enhance patient care





# Essentials for Surgical Residents Completing PGY-1

## Essentials for Surgical Residents Completing PGY-1

Upon completing the first postgraduate year, surgical residents should have acquired the knowledge and skills listed here in order to provide optimum patient care and ensure patient safety. The knowledge and skills should serve as the foundation for further education and training in the various surgical specialties. The areas of knowledge and skills are listed in the context of the core competencies: Medical Knowledge and Patient Care, Professionalism, Interpersonal and Communication Skills, Practice-Based Learning and Improvement, and Systems-Based Practice.

# Medical Knowledge and Patient Care

## Clinical Assessment and Perioperative Management

- ◆ Obtain a detailed surgical history that is appropriate for age, sex, and clinical problem
- ◆ Obtain and review relevant medical records and reports
- ◆ Perform a detailed physical examination
- ◆ Develop a focused differential diagnosis
- ◆ Assess, document, and manage perioperative risk factors:
  - ◆ Diseases:
    - ◆ *Cardiac*
    - ◆ *Endocrine*
    - ◆ *Hepatic*
    - ◆ *Infectious*
    - ◆ *Psychiatric*
    - ◆ *Pulmonary*
    - ◆ *Renal*
  - ◆ Conditions:
    - ◆ *Extremes of age*
    - ◆ *Immune suppression*
    - ◆ *Metabolic disorders*
    - ◆ *Pregnancy*
    - ◆ *Substance abuse*
- ◆ Write a succinct and thorough history and physical
- ◆ Obtain a written informed consent

- ◆ Document the treatment plan in the medical record, including the indications for treatment
- ◆ Dictate an appropriate operative note and discharge summary
- ◆ Write comprehensive admission, preoperative, and postoperative orders including:
  - ◆ Activity level
  - ◆ Management of medications
  - ◆ Pain management
- ◆ **Obtain relevant medical information from:**
  - ◆ Previous hospitalizations in the same institution
  - ◆ Previous hospitalizations in other institutions
  - ◆ The patient's other physicians
- ◆ **Make appropriate patient discharge arrangements including:**
  - ◆ Follow-up appointments
  - ◆ Urgent contact information for the doctor to reach the patient
  - ◆ Urgent contact information for the patient to reach the doctor
- ◆ Obtain consultation appropriately from other specialists as needed
- ◆ Read and use the multidisciplinary medical record and patient data

## Assessment of Basic Diagnostic Tests and Radiographs

- ◆ Order and interpret appropriate laboratory and imaging studies in a cost-effective manner
- ◆ Manage abnormalities identified by basic laboratory tests
- ◆ Recognize the following abnormalities based on imaging studies:
  - ◆ Abdominal mass
  - ◆ Aortic aneurysm
  - ◆ Aortic dissection/rupture
  - ◆ Appendicitis
  - ◆ Atelectasis
  - ◆ Bowel gas patterns
  - ◆ Diaphragm abnormalities
  - ◆ Fractures, long bones
  - ◆ Free air in abdomen
  - ◆ Hemothorax
  - ◆ Intracranial hematoma
  - ◆ Lung mass
  - ◆ Paraesophageal hernia
  - ◆ Pleural effusion
  - ◆ Pneumonia
  - ◆ Pneumothorax
  - ◆ Pulmonary embolism
  - ◆ Pulmonary infiltrate
  - ◆ Retroperitoneal abnormalities and injuries
  - ◆ Spinal column fractures
  - ◆ Visceral abnormalities and injuries

- ◆ Verify radiographically the appropriate placement of:
  - ◆ Central venous line
  - ◆ Chest tube
  - ◆ Endotracheal tube
  - ◆ Feeding tube
  - ◆ Nasogastric tube
  - ◆ Tracheostomy
- ◆ Recognize and initiate treatment of cardiac ischemia and arrhythmia in the surgical patient

## Nutrition

- ◆ Perform a metabolic assessment of the surgical patient
- ◆ Describe the metabolic implications of trauma and surgical stress
- ◆ Calculate nutritional requirements in health and disease
- ◆ Recognize the indications, options, and timing for nutritional support of the surgical patient
- ◆ Initiate enteral and parenteral nutritional support
- ◆ Manage and monitor nutritional support
- ◆ Describe complications of enteral and parenteral nutrition
- ◆ Manage:
  - ◆ Central venous lines
  - ◆ Gastrostomies
  - ◆ Jejunostomy feeding tubes
- ◆ Assess appropriate timing of resumption of oral intake after an operation

## Airway Management and Anesthesia

- ◆ Diagnose and manage common causes of airway obstruction in the surgical patient
- ◆ Describe indications for and how to perform surgical airways:
  - ◆ Cricothyroidotomy
  - ◆ Open tracheostomy
  - ◆ Percutaneous tracheostomy
- ◆ Describe indications for and be able to perform orotracheal intubation
- ◆ Position the patient properly for operative exposure, temperature control, and protection from pressure/traction
- ◆ Describe the appropriate level of intraoperative monitoring for a given patient
- ◆ Describe the complications of and be able to order appropriately:
  - ◆ Barbiturates
  - ◆ Local anesthetics
  - ◆ Neuromuscular blockade reversal agents
  - ◆ Neuromuscular blockers
  - ◆ Sedatives
- ◆ Describe the role and indications for use of epinephrine in local anesthesia

## Management of Fluid/Electrolytes and Acid/Base Balance

- ◆ **Appropriately manage preoperative and postoperative fluid requirements, as guided by:**
  - ◆ Vital signs
  - ◆ Physical examination
  - ◆ Urine output
  - ◆ Central venous pressure
  - ◆ Pulmonary capillary wedge pressure
- ◆ **Recognize acid-base disorders and manage them correctly**
- ◆ **Make adjustments in fluid administration for comorbid conditions:**
  - ◆ Cardiac insufficiency
  - ◆ Diabetes
  - ◆ Extremes of age
  - ◆ Intestinal fistula
  - ◆ Pregnancy
  - ◆ Renal insufficiency
- ◆ **Recognize and treat abnormalities in the levels of the following electrolytes:**
  - ◆ Calcium
  - ◆ Magnesium
  - ◆ Phosphate
  - ◆ Potassium
  - ◆ Sodium

## Fever and Surgical Infections

- ◆ Initiate appropriate evaluation of fever and provide supportive treatment
- ◆ Initiate definitive treatment of fever with source control and appropriate antibiotics
- ◆ Describe how to monitor antibiotic levels appropriately
- ◆ Describe antibiotic-related complications, and discuss methods of prevention
- ◆ Discuss the normal flora of various organ systems
- ◆ Describe the common bacteria involved in site-specific infections
- ◆ Discuss the principles of prevention of nosocomial infections, sterile technique, and universal precautions
- ◆ Order and interpret appropriate imaging studies for localization of infection
- ◆ Discuss the principles of abscess drainage
- ◆ Discuss the indications for and appropriate administration of prophylactic antibiotics
- ◆ Discuss the causes and mediators of the systemic inflammatory response syndrome and its pathophysiology
- ◆ Recognize the systemic inflammatory response syndrome, and initiate appropriate supportive treatment
- ◆ Discuss the development of bacterial resistance and the basic characteristics of epidemics
- ◆ Discuss the common opportunistic infections associated with immunocompromised patients

## Wound Management

- ◆ Describe the differences in primary, secondary, and delayed primary healing
- ◆ Describe the management of traumatic wounds, including tetanus prophylaxis
- ◆ Describe wound management based on the classification of wounds (clean, clean-contaminated, contaminated, infected)
- ◆ Describe the signs of necrotizing soft tissue infection
- ◆ Identify, differentiate, and treat wound complications of infection, hematoma, and seroma
- ◆ Perform extensive wound debridement under supervision
- ◆ Debride and pack wounds and apply dressings
- ◆ Identify wound dehiscence and evisceration, and initiate care
- ◆ Discuss specific recommendations for management and prevention of complications in animal and insect bites
- ◆ Obtain a proper wound specimen for Gram stain and cultures

## Critical Care and Management of Shock

- ◆ Differentiate types of shock, and initiate appropriate therapy:
  - ◆ Anaphylactic
  - ◆ Cardiogenic
  - ◆ Hemorrhagic
  - ◆ Neurogenic
  - ◆ Septic
- ◆ Maintain pulmonary artery and arterial catheters, interpret data, and direct therapy
- ◆ Discuss principles of mechanical ventilation, including volume and pressure-controlled modes
- ◆ Outline the indications for blood component therapy, and direct treatment
- ◆ Identify major and minor transfusion reactions, and initiate management
- ◆ Institute measures to prevent complications in critically ill patients:
  - ◆ Aspiration
  - ◆ Deep vein thrombosis
  - ◆ Line sepsis
  - ◆ Pressure ulcers
  - ◆ Upper gastrointestinal bleeding

## Trauma and Surgical Emergencies

- ◆ Obtain Advanced Trauma Life Support® certification if caring for multisystem trauma
- ◆ Under supervision:
  - ◆ Resuscitate patients from shock
  - ◆ Interpret data from primary and secondary surveys
  - ◆ Initiate further evaluation
  - ◆ Initiate definitive management
  - ◆ Insert:
    - ◆ *Chest tubes*
    - ◆ *Nasogastric tubes*
    - ◆ *Nasotracheal tubes*
    - ◆ *Orotracheal tubes*
    - ◆ *Peripheral and central lines*
    - ◆ *Trauma lines*
    - ◆ *Urinary catheters*
- ◆ Discuss options for rapid assessment of intraabdominal bleeding
- ◆ Order and interpret screening radiographs and computed tomographic scans
- ◆ Identify and initiate treatment of neurologic injuries:
  - ◆ Intracranial hemorrhage
  - ◆ Spinal fractures
- ◆ List injuries most commonly missed on primary and secondary surveys
- ◆ Discuss basic principles of fracture management
- ◆ Describe the symptoms, signs, diagnosis, and management of inhalation injuries
- ◆ Describe the symptoms, signs, diagnosis, and management of the acute abdomen

## Stroke and Transient Ischemic Attack

- ◆ Differentiate between focal and nonfocal neurologic signs
- ◆ Order appropriate imaging studies to investigate cerebrovascular events

## Coagulation and Anticoagulation

- ◆ Develop a differential diagnosis and institute appropriate management of basic hyper- and hypocoagulable states (eg, deep vein thrombosis [DVT] and pulmonary embolism [PE], disseminated intravascular coagulation [DIC])
- ◆ Perform risk assessment for DVT and PE
- ◆ Describe appropriate DVT/PE prophylaxis based on risk assessment

## Pharmacology and Pharmacokinetics

- ◆ Interpret drug levels and use pharmacokinetics for drug administration
- ◆ Describe indications and complications of common drugs used in surgical patients:
  - ◆ Analgesics
  - ◆ Antibiotics
  - ◆ Anticoagulants
  - ◆ Antiemetics
  - ◆ Antihypertensives
  - ◆ Antiplatelet agents
  - ◆ Chemotherapeutic agents
  - ◆ Corticosteroids
  - ◆ Diuretics
  - ◆ Gastric acid-reducing drugs
  - ◆ Laxatives
  - ◆ Nonsteroidal antiinflammatory drugs (NSAIDs)
  - ◆ Oral hypoglycemic agents
  - ◆ Sedatives
- ◆ Discuss the implications of hepatic or renal insufficiency and extremes of age on the use of various drugs
- ◆ Identify common drug interactions

## Complications and Conditions in Surgical Patients

- ◆ Evaluate and outline age-appropriate initial management of the following:
  - ◆ Abdominal distention
  - ◆ Acute abdomen
  - ◆ Acute alcohol intoxication
  - ◆ Alcohol or drug withdrawal
  - ◆ Altered mental status
  - ◆ Arterial bleeding
  - ◆ Aspiration
  - ◆ Aspiration pneumonia
  - ◆ Atelectasis
  - ◆ Bleeding and coagulopathy
  - ◆ Bowel obstruction
  - ◆ Chest pain
  - ◆ Congestive heart failure
  - ◆ Constipation
  - ◆ Contrast allergy
  - ◆ Contrast-induced nephropathy
  - ◆ Cyanosis
  - ◆ Deep vein thrombosis
  - ◆ Diabetic ketoacidosis
  - ◆ Dyspnea
  - ◆ Dysrhythmias (as covered in Advanced Cardiovascular Life Support)
  - ◆ Fecal impaction
  - ◆ Fever
  - ◆ Gastrointestinal bleeding
    - ◆ Lower
    - ◆ Upper
  - ◆ Hemothorax
  - ◆ Hyperosmolar coma
  - ◆ Hypertension

- ◆ Hyperventilation
- ◆ Hypotension
- ◆ Hypoventilation
- ◆ Hypovolemia
- ◆ Hypoxia
- ◆ Intestinal ischemia
- ◆ Jaundice
- ◆ Malignancies (common; eg, breast, colon, lung)
- ◆ Nausea
- ◆ Oliguria
- ◆ Peripheral ischemia
  - ◆ *Acute*
  - ◆ *Chronic*
- ◆ Peritonitis
  - ◆ *Generalized*
  - ◆ *Localized*
- ◆ Phlebitis, superficial
- ◆ Pleural effusion
- ◆ Pneumonia
- ◆ Pneumothorax
- ◆ Postoperative pain
- ◆ Pulmonary edema
- ◆ Pulmonary embolus
- ◆ Retroperitoneal hematoma
- ◆ Seizures
- ◆ Substance abuse
- ◆ Transfusion reaction
- ◆ Urinary retention
- ◆ Vomiting
- ◆ Wound hematoma or seroma

## Surgical and Technical Skills

- ◆ Describe concepts of atraumatic tissue handling
- ◆ Perform as first assistant
- ◆ Obtain hemostasis of small vessels in the operative field
- ◆ Identify common surgical instruments and suture materials and their proper uses
- ◆ Perform basic surgical maneuvers (suture of skin, soft tissues, and fascia; knot tying)
- ◆ Demonstrate appropriate techniques of dissection, handling of tissues, and wound closure
- ◆ Under supervision, perform basic surgical procedures such as the following:
  - ◆ Anorectal procedures (simple)
  - ◆ Anoscopy
  - ◆ Appendectomy
  - ◆ Breast biopsy
  - ◆ Burr hole
  - ◆ Digital amputation
  - ◆ Doppler examination (handheld) to evaluate arterial circulation
  - ◆ Examination under anesthesia
  - ◆ Excision of benign lesions of skin and subcutaneous tissues
  - ◆ Implanted venous access
  - ◆ Incision and drainage of an abscess
  - ◆ Insertion of central venous catheters
  - ◆ Insertion of gastrostomy tubes

- ◆ Insertion of pulmonary artery catheters
- ◆ Lymph node biopsy
- ◆ Paracentesis
- ◆ Removal of superficial foreign bodies
- ◆ Repair of simple lacerations
- ◆ Repair of umbilical and inguinal hernias
- ◆ Skin grafts
- ◆ Thoracentesis
- ◆ **Manage central venous lines and gastrostomy and jejunostomy feeding tubes**
- ◆ **Insert, maintain, and remove drains and chest tubes**
- ◆ **Insert and manage tubes and drains placed operatively or percutaneously**
- ◆ **Perform orotracheal intubation**
- ◆ **Perform surgical airways (cricothyroidotomy, open and percutaneous tracheostomy)**
- ◆ **Immobilize extremities**
- ◆ **Insert indwelling arterial and venous lines**
- ◆ **Demonstrate appropriate methods of routine and reverse isolation procedures**
- ◆ **Maintain appropriate sterile technique in the emergency department, intensive care unit, office, and at the patient's bedside**
- ◆ **Describe potential complications of procedures and how they relate to patient safety**

## *Professionalism*

- ◆ Adhere to the local institutional code of conduct, demeanor, behavior, and attire
- ◆ Demonstrate altruism in patient care
- ◆ Respect all individuals
- ◆ Use discretion in private and public communications
- ◆ Maintain an inquisitive mind and lifelong learning habits
- ◆ Know when and where to obtain help for professional and personal issues
- ◆ Demonstrate self-directed learning skills
- ◆ Care for patients in a compassionate way, consistently demonstrating respect for the privacy and dignity of all patients
- ◆ Accept feedback appropriately, and use it effectively for self-learning and improvement
- ◆ Work collaboratively with other members of the patient care team
- ◆ Use the resources available when ethical or professional behavior problems arise (department, institution, American College of Surgeons, etc)
- ◆ Demonstrate a strong work ethic, and consistently and dependably carry out one's duties with honesty, personal integrity, self-motivation, and self-discipline

- ◆ Demonstrate mentoring and positive role-modeling skills
- ◆ Develop teaching skills, and facilitate medical student learning
- ◆ Be well organized and efficient; demonstrate good time management to balance personal and professional responsibilities
- ◆ Know one's limitations and when to ask for help
- ◆ Discuss issues of ethics:
  - ◆ Advanced directives
  - ◆ Surrogacy
- ◆ Complete medical records in a timely fashion
- ◆ Fulfill administrative responsibilities in a timely fashion
- ◆ Accept responsibility for one's actions
- ◆ Be illegal/illicit substance free
- ◆ Attend required conferences
- ◆ Be punctual
- ◆ Develop and maintain evidence of good professional standing:
  - ◆ State licensure
  - ◆ Membership in professional organizations

## *Interpersonal and Communication Skills*

- ◆ Actively listen with cultural, ethnic, gender, racial, and religious sensitivity
- ◆ Communicate effectively with patients, families, and professional associates
- ◆ Give an accurate, clear, and concise oral presentation
- ◆ Discuss effectively with patients such sensitive issues as:
  - ◆ Advanced directives
  - ◆ Brain death
  - ◆ End-of-life care
  - ◆ Permission for postmortem examination
- ◆ Communicate information to coworkers accurately and effectively to ensure continuity of care
- ◆ Share information regarding adverse events and changes in conditions of patients with other members of the health care team in a timely and effective fashion
- ◆ Discuss medical errors or professional mistakes honestly and openly within the context of quality improvement to promote patient safety, trust, and self-learning
- ◆ Discuss strategies to share information regarding adverse outcomes with patients and families
- ◆ Obtain informed consent
- ◆ Demonstrate appropriate interactions when performing and obtaining professional consultations
- ◆ Present medical information completely and appropriately, both written and oral

## *Practice-Based Learning and Improvement*

- ◆ Maintain a personal patient log
- ◆ Describe methods of outcomes assessment, including measures of health status and patient satisfaction
- ◆ Discuss the principles of continuous quality improvement and their role in improving patient care and the learning environment
- ◆ Use independent self-study and assessment programs, such as Surgical Education and Self-Assessment Program (SESAP)
- ◆ Critically analyze available literature and its application to patient care
- ◆ Discuss the common sources of medical errors, and outline steps to avoid or minimize them
- ◆ Use discussions about adverse events and near misses as a means of self-reflection, enhancing patient safety and improving patient care
- ◆ Participate in root cause analyses of adverse events, including implementation of corrective measures
- ◆ Be proficient with computer applications; eg, word-processing programs, spreadsheets, simple databases, and electronic presentations
- ◆ Use electronically available medical information in patient care
- ◆ Apply the principles of evidence-based medicine in patient care
- ◆ Demonstrate critical, literature review skills
- ◆ Understand basic statistical techniques, and interpret statistics related to clinical data

## *Systems-Based Practice*

- ◆ Identify barriers to access to health care
- ◆ Use the medical record appropriately
- ◆ Use institutional resources, such as social services, home health care, outpatient services, etc, for effective discharge planning; be able to begin this process well in advance for efficient and patient-oriented discharge
- ◆ Discuss the need for cost-benefit analysis of workup and treatment options, and participate in the development of a cost-effective patient management plan
- ◆ Apply the appropriate documentation needed for coding and billing
- ◆ Describe and apply the principles of clinical research
- ◆ Have specific information about accessing rehabilitation services, indications for referral, and the potential benefits to be anticipated
- ◆ Describe how types of medical practice and delivery systems differ from one another, including methods of controlling costs and allocating resources

- ◆ Describe and participate in implementation of patient safety practices, such as Joint Commission on Accreditation of Healthcare Organizations (JCAHO) patient safety standards; eg,
  - ◆ Improving the accuracy of patient identification
  - ◆ Improving the effectiveness of communication among caregivers
  - ◆ Improving the safety of using high-alert medications
  - ◆ Eliminating wrong-site, wrong-patient, wrong-procedure surgery
    - ◆ *Using a time-out in operative procedures*
  - ◆ Improving the effectiveness of clinical alarm systems
  - ◆ Reducing the risk of health care–acquired infections
- ◆ Comply with Health Insurance Portability and Accountability Act of 1996 (HIPAA) regulations regarding patient privacy and confidentiality
- ◆ Demonstrate collegiality in working with all of those associated with the care of patients
- ◆ Use electronically available medical information effectively
- ◆ Apply information technology effectively to enhance patient care
- ◆ Understand the concept of risk management and the need for appropriate documentation in the medical record
- ◆ Practice cost-effective medical care
- ◆ Practice patient safety
- ◆ Describe the process and benefits of root cause analysis











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