Trauma & Surgical Critical Care
Goals and Objectives
Competency Based Curriculum

Patient Care

R1: The intern will develop a fundamental understanding of specific concepts in the following areas:

Resuscitation and Diagnostic Decision Making:
- History taking: the ability to collect an appropriate history as it relates to traumatic injury and critical illness.
- Physical exam: perform both a comprehensive and directed physical exam relevant to the traumatically injured or critically ill patient.
- Establishment of resuscitative, diagnostic, and treatment priorities in patients with multiple non-life-threatening injuries.
- Basic means of establishing intra-vascular access
- Basic indications, contraindications, risks and potential benefits of invasive patient monitoring

Operative Management of Trauma:
- Indications for immediate operative management of the traumatically injured patient

R2: The resident will build upon his/her fundamental understanding of the above concepts and demonstrate the ability to integrate them into their daily practice. In addition the resident will demonstrate a comprehensive understanding of concepts in the following areas:

Resuscitation and Diagnostic Decision Making:
- The essential elements of a complete medical history and integrate those elements into the development of a therapeutic, diagnostic and treatment plans.
- Advanced knowledge of the physical exam including maneuvers that can elicit significant physical exam findings not present on routine exam (e.g.: pathologic neurologic reflexes)
- Establish resuscitative, diagnostic and treatment priorities patients with multiple life-threatening injuries.
- Establish basic airway management
- Focused neurological evaluation
- Importance of thermal control
- Advanced means of establishing intra-vascular access
- Pharmacology of resuscitative fluids and vasoactive agents
- Advanced indications, contraindications, risks and potential benefits of invasive patient monitoring, including limitations and utility in clinical decision making.

**Operative Management of Trauma:**
- Principles of operative patient positioning
- An advanced understanding of indications for immediate operative intervention.

**R3:** In addition to understanding concepts mastered during the junior years, the senior resident will develop an in-depth understanding of key elements in each of the following areas:

**Resuscitation and Diagnostic Decision Making:**
- Basic and advanced airway management
- Management of immediately life threatening blunt and penetrating chest injury
- Extensive knowledge of invasive monitoring procedures and ability to integrate these methods to the development of diagnostic and therapeutic plans. In addition the resident will also assist junior peers in procedural skill acquisition.
- Capabilities and limitations of various diagnostic studies including plain radiographs, ultra-sound, diagnostic peritoneal lavage, CT scan, angiography
- Decision making regarding patient flow to further diagnostic studies, operating room, intensive care unit, or surgical floor
- Indications and performance of various unusual trauma bay procedures including resuscitative thoracotomy, post-mortem cesarean section, reduction and splinting of fractures and dislocation
- Decision making with respect to patient discharge and follow-up care
- Consistent integration of medical facts with clinical data, while incorporating potential risks, benefits and alternatives.

**Operative Management of Trauma:**
- Establish intra-operative treatment priorities
- Advanced vascular exposure
- Operative sequence of multiple complex injuries in all body areas and organ systems
- Comprehensive knowledge of injury identification and treatment of injuries involving all body areas
- Basic knowledge of orthopedic, urologic, plastic, ENT, and neurosurgical operations including indications, timing, complications, and limitations
- Principles of damage control, including temporizing techniques for vascular and enteric injuries

**Medical Knowledge**

**R1:**
The intern is expected to develop an understanding of the key elements in each of the following areas:

**Principles of Post-injury Care:**
- Consistently apply basic science principles to common clinical situations.
- Familiarity with various modes of mechanical ventilation, as well as learning techniques to improve gas exchange.
- Refined ability to interpret radiographic findings, EKGs, laboratory data, and intravascular and intra-cranial monitoring systems.
- Basic pharmacological principles of anesthesia
- Basic knowledge of the evaluation, resuscitation, treatment, and long-term effects of injuries to the following organ systems or body areas:
  - Central and peripheral nervous system.
  - Head and neck
  - Cardiac system
  - Major vascular structures including great vessels, carotid, upper extremity, aorta and its major braches, as well as lower extremity. This also includes corresponding major venous structures.
  - Thoracic contents including ribs, pleural space, lungs
  - Intra-abdominal contents including the stomach, small bowel, colon, spleen, pancreas, hepato-biliary system and diaphragm
  - Genito-urinary system
  - Bony structures including face, extremities, spine, skull, and pelvis
  - Soft tissues including skin and muscles
  - Endocrine organs
  - Psychiatric disorders including substance abuse, post-traumatic stress disorder
- Fundamentals of surgical nutrition including nutrition evaluation as well as routes of access, TPN, eternal nutrition, and nutritional supplements
R2: The resident will build upon his/her fundamental understanding of the above concepts. In addition the resident will develop a comprehensive understanding of concepts in the following areas:

**Principles of Post-injury Care:**
Progression in analytical thinking through the application of basic science principles to clinical problems.

- Evaluate and treat a variety of post-operative or general medical problems that are common after traumatic injury or during critical illness. This requires a comprehensive understanding of the physiology, pathophysiology, diagnosis, and treatment of disorders in the following systems:
  - Neurologic
  - Cardiovascular
  - Respiratory
  - Gastrointestinal
  - Hepato-biliary
  - Endocrine
  - Musculoskeletal
  - Hematologic
  - Infectious disease
  - Immunologic
  - Genito-urinary
  - Systemic inflammatory response syndrome and sepsis
  - Pharmacokinetics and dynamics of drug metabolism
  - Acute and chronic pain management

R3: In addition to understanding concepts mastered during the junior years, the senior resident will develop an in-depth understanding of key elements in each of the following areas:

**Principles of Post-injury Care:**

- Integration of his/her knowledge of the injures to various organ systems and the interaction of each as well as organ-organ interactions.
- Limitations and indications for monitoring
- Brain death evaluation and certification
- Organ donation including procurement, preservation, harvest, allocation, and the activities of major organ donation agencies
- Diagnosis and management of persistent vegetative state
- Importance of infection control
• Outpatient management of the trauma patient

Practice-Based Learning and Improvement

R1/2:

• Interns and junior residents will learn how to effectively utilize hospital and University educational resources and begin to apply literature based and evidence based concepts as well as experimental evidence to their daily practice of surgery.

• Interns and junior residents will demonstrate ability to use electronic references including hand-held computers, web-based resources, and common electronic databases (i.e.: Medline) to support patient care and self-education.

• Develop and maintain a willingness to learn from failures and use failures to improve both personal performance and the overall process of patient care.

R3:

• Senior level residents will consistently analyze their clinical experience of practice, identify areas for improvement and take appropriate educational steps to strengthen these weaknesses.

• Senior level residents will be able to critically evaluate information in the surgical and critical care literature as it pertains to their practice of surgery.

Interpersonal and Communication Skills

R1: The intern is expected to develop an understanding of the key elements in each of the following areas:

Resuscitation and Diagnostic Decision Making:
  • Effective communication and interaction with the emergency department
  • Effective communication and interaction with ancillary support staff

Principles of Post-injury Care:
  • Develop effective verbal and written communication skills

R2: The resident will build upon his/her fundamental understanding of the above concepts. In addition the resident will develop a comprehensive understanding of concepts in the following areas:

Resuscitation and Diagnostic Decision Making:
  • Effective communication with sub-specialty services
**R3:** In addition to understanding concepts mastered during the junior years, the senior resident will develop an in-depth understanding of key elements in each of the following areas:

**Resuscitation and Diagnostic Decision Making:**
- Principles of trauma team leadership and command presence during resuscitation.

**Operative Management of Trauma:**
- Timely, effective communication and interaction with the anesthesia team
- Effective communication with OR staff and leadership within the OR

**Professionalism**
- All residents will demonstrate personal integrity, honesty, accountability, respect, compassion, patient advocacy and dedication to patient care and well-being that supersedes self-interest.
- All residents will demonstrate a commitment to excellence and continuous professional development.
- All residents will demonstrate a commitment to ethical principles pertaining to the provision of critical care, patient confidentiality, and informed consent.
- All residents are expected to demonstrate sensitivity and responsiveness to patients’ culture, age, gender, and disabilities.
- All residents will demonstrate respect and a professional demeanor in relationships with colleagues.
- All residents will develop lifelong learning skills through the application of basic science concepts to clinical management, critical reading and critical thinking.

**R1/2:** Junior level residents are expected to demonstrate a basic understanding of the following:
- Ethical, Economic and Legal Aspects of Trauma Care
- Basic ethical principles for commonly encountered ethical dilemmas
- Societal impact of traumatic injury and trauma care
- Economic impact upon the patient and family
- Elements of malpractice and strategies for limiting risk

**R3:** The resident is expected to develop the following:
- Organizational skills
- Leadership skills including personnel management, negotiation, team development, and conflict resolution.

**System-Based Practice**

**R1:** The intern will develop a basic understanding of key elements in the following areas:
- Epidemiology of Trauma and Injury Prevention
- The local, regional, national and international economic, societal, and clinical impact of traumatic injury.

**Pre-hospital Care:**
- Organization, supervision, and coordination of emergency medical services

**Principles of Post-injury Care:**
- Develop an appreciation for the benefits of a multi-disciplinary approach to management of critically ill surgical patients.

**R2:** The resident will develop a more in-depth understanding of the above concepts. In addition the resident is required to demonstrate understanding of:

**Pre-hospital Care:**
- Influence of environmental factors on pre-hospital care
- Communication between EMS, aeromedical transport, referral hospitals and the trauma center

**Resuscitation and Diagnostic Decision Making:**
• Resource management within the emergency department
• Management of limited blood resources
• Cost-effective care within the emergency department
• Safety concerns in the trauma resuscitation area

**R3:** The resident will develop an appreciation and understanding of:

- Epidemiology of Trauma and Injury Prevention
- Basic principles of risk identification and development of preventive strategies
- Fundamental aspects of public health issues

**Pre-hospital Care:**

- Principles, risks, and benefits of EMS and aeromedical transport
- Organization, supervision, coordination, and interaction with aeromedical agencies
- EMS and aeromedical safety issues
- Identification and understanding of the limitations of regional healthcare delivery systems, including EMS, intra-hospital transport agencies, and referral hospitals
- Priorities of on-scene and in-transit patient evaluation and resuscitation

**Operative Management of Trauma:**

- Resource limitations and availability of the operating room including the conflicting duty to provide both elective and emergency surgical care
- Fundamentals of management including triage, communication, manpower management, and resource utilization.

**Fundamentals of Rehabilitation:**

- Physical medicine and rehabilitation
- Effective communication and collaborative practice with ancillary services including speech therapy, occupational therapy, physical therapy, respiratory therapy, and substance abuse counselors
- Management of common complications that occur in the rehabilitation environment