

Parkland SICU and Parkland MICU Goals and Objectives

The program is designed to give the Fellow in-depth instruction in the many aspects of surgical critical care. The multi-disciplinary nature of the Fellowship with rotations in Burn Surgery, Neurosurgery and Pediatric Surgery allows application of knowledge and skills across multiple disciplines. This is further ensured through the delivery of critical care to a large volume of patients.

I. Cardiopulmonary Systems/Monitoring and Medical Instrumentation

Knowledge	Skills
1. Understand pathophysiology associated with different causes of hemodynamic instability. <i>Examples include types of shock, cardiac arrest.</i>	Utilize advanced technology (ECHO and ultrasound) to optimize patient care. Insert pulmonary artery, central venous and arterial lines and obtain hemodynamic data; interpret data and initiate therapy. Instruct junior residents in insertion of invasive monitors and interpretation of data. Resuscitate patients from shock and cardiac arrest.
2. Know and apply treatments for arrhythmias, congestive heart failure, acute ischemia and pulmonary edema.	Recognize and treat ischemia and arrhythmia on ECG. Utilize correct class of anti-arrhythmic, vasodilators and diuretics as they pertain to cardiac disease. Be able to interpret and instruct current ACLS guidelines.
3. Understand factors associated with assessment of preoperative surgical risk. <i>Examples include evaluation of the high risk cardiac patient undergoing non-cardiac surgery</i>	Ability to assess preoperative risk based on history, physical exam, laboratory and radiographic data. Correctly interpret data and optimize the high-risk cardiopulmonary patient for surgery.
4. Understand pathophysiology associated with respiratory failure.	Proficiency and ability to instruct in endotracheal intubation and tracheostomy through multiple routes. Interpret arterial blood gas analysis and chest radiography and institute appropriate therapy. Use of diagnostic and therapeutic bronchoscopy.
5. Understand pathophysiology, indications for, and complications associated with various modes of mechanical ventilation. <i>Examples include ventilator management of ALI, ARDS and thoracic trauma, as well as weaning from ventilatory support.</i>	Ventilator management in common surgical disease. Ability to set up initial and advanced ventilator settings including salvage modes. Ability to treat common complications of mechanical ventilation including tube thoracostomy. Ability to wean from ventilatory support.
6. Understand adjuncts to the analysis of respiratory mechanics and gas exchange. <i>Examples include work of breathing, rapid shallow breathing index, single breath CO₂ analysis and dead space measurements.</i>	Appropriately use adjuncts to assist in the management of ventilated patients. Interpretation of work of breathing, dead space measurements and institute therapy based on determination. Use of pressure/volume curves and other computer graphics.

II. Fluids/Electrolytes/Renal Systems

Knowledge	Skills
1. Understand fluid and electrolyte as well as acid/base abnormalities associated with complex surgical procedures and complications. <i>Examples include massive fluid shifts associated with trauma, shock and resuscitation, high output fistulas and renal failure.</i>	Correctly evaluate patient's volume status, interpret electrolyte and arterial blood gas analysis in the context of the underlying surgical disease or complication and initiate appropriate fluid therapy based on results. Instruct junior residents in the above.
2. Understand the pathophysiology of oliguria, anuria and acute renal failure. Understand the indications for and different modes of dialysis.	Correctly interpret volume and electrolyte status and determine cause of oliguria. Initiate appropriate pharmacological mode of dialysis when indicated.

III. Metabolic/Nutrition/Endocrine Systems

Knowledge	Skills
1. Understand the role of hormones and cytokines in the graded metabolic response to injury, surgery and infection.	Correctly determine the protein, caloric, electrolyte, fat and vitamin needs of surgical patients, taking into account their underlying disease process. Instruct junior residents in fluid and electrolyte disorders in the ICU.
2. Understand the indications, routes and complications of administration of parenteral and enteral forms of nutrition.	Initiate appropriate nutritional support through the most optimal route. Manage complications of nutritional support. <i>Examples include hyperglycemia.</i> Perform and instruct junior residents in performance of bedside percutaneous gastrostomy.
3. Understand the pathophysiology associated with endocrine emergencies in the ICU. <i>Examples include thyroid storm, hyper, hypoparathyroid states and adrenal insufficiency.</i>	Correctly interpret physiologic and laboratory data associated with endocrine emergencies and initiate therapy.

IV. Infection/Immune System

Knowledge	Skills
1. Understand the mechanism of action as well as the spectrum of antimicrobial activity of the different antibiotic classes. <i>Examples include carbapenams, extended spectrum penicillins and fluoroquinolones.</i>	Consider the most likely microbial pathogen and select the correct empiric antibiotic. Interpret culture and sensitivity data when available and refine antibiotic choice.
2. Understand the risk factors that result in multiply resistant organisms. <i>Examples include antibiotic dosing, antibiotic synergy and transmission patterns.</i>	Utilize pharmacokinetics and drug levels to adjust antibiotic dosing. Utilize appropriate combinations of antibiotics to achieve synergy. Appropriately utilize isolation precautions.
3. Understand the risk factors and common pathogens that are associated with nosocomial infections.	Identify and minimize factors associated with nosocomial infections. Instruct junior residents in sterile techniques and application of maximum barrier precautions. Utilize appropriate adjunctive measures to diagnose and treat nosocomial infection. <i>Examples include bronchoscopy to aid in the diagnosis of ventilator-associated pneumonia.</i>
4. Understand the factors that result in an immunocompromised state. <i>Examples include malignancy, major trauma and steroids.</i>	Identify unique infections found in immunocompromised hosts and select appropriate antibiotic/antifungal therapy.

V. Hematologic System

Knowledge	Skills
1. Understand the indications for, and complications of blood component therapy.	Correctly diagnose and treat anemia, and thrombocytopenia. Correctly diagnose and treat transfusion reactions. Appropriately use pharmacologic therapy to minimize the need for transfusion.
2. Understand the factors associated with bleeding disorders. <i>Examples include DIC, ITP, hemophilia, coagulopathy associated with shock and hypothermia.</i>	Correctly diagnose and treat coagulopathy associated with either acquired or congenital disease.

VI. Neurologic System

Knowledge	Skills
1. Understand the pathophysiology of traumatic brain injury. <i>Examples include knowledge of intracranial pressure monitoring and maneuvers to normalize ICP.</i>	Appropriately use intracranial pressure monitoring. Interpret hemodynamic ICP and cerebral metabolic data. Initiate therapy to maintain cerebral perfusion pressure and oxygenation and minimize secondary brain injury.
2. Understand the factors associated with altered mental status. <i>Examples include traumatic, septic, metabolic and pharmacologic causes.</i>	Correctly diagnose and treat causes of altered mental status in the ICU.

VII. Gastrointestinal/Hepatobiliary Systems

Knowledge	Skills
1. Understand fluid compositions and the effect of the losses of such fluids as gastric, pancreatic and biliary from fistulas at various levels.	Correctly diagnose and treat complex fistulas arising from any place in the GI tract.
2. Understand the risk factors associated with stress gastritis.	Correctly utilize prophylaxis for stress gastritis in high risk ICU patients.
3. Understand the causes and treatment regimens for gastrointestinal bleeding. <i>Examples include bleeding from upper and lower GI sources.</i>	Correctly diagnose and treat gastrointestinal bleeding associated with ulcers, portal hypertension and lower GI sources. Perform rigid sigmoidoscopy when indicated.
4. Understand the pathophysiology of hepatic failure.	Diagnose cause and appropriately alter treatment regimens to compensate for hepatic failure. <i>Examples include altering fluid, protein and drug regimens.</i> Performance of paracentesis with and without ultrasound guidance.

VIII. Administrative/Ethical Issues

Knowledge	Skills
1. Understand end of life and legal and ethical issues. <i>Examples include organ donation and withdrawal of support.</i>	Work with family to respect patient's end of life wishes, including withdrawal of care in a dignified manner. Work with the organ bank and trainees to coordinate care for organ donation. Pass Texas Jurisprudence Exam.
2. Understand the role of surgeons in the ICU as well as the role of consultants	Appropriately use consultants when indicated.
3. Understand rationale for admission and discharge criteria in the ICU and cost implications of ICU care.	Appropriately admit and discharge?? critically ill and recovering patients as indicated.
4. Understand the mechanism and need for performance improvement.	Take part in, and address performance improvement issues.

IX. Special Patient Populations

Knowledge	Skills
1. Understand physiology of Obstetric and Gynecologic patient requiring ICU care including those with postpartum hemorrhage, pregnancy induced hypotension and obstetric conditions resulting in ARDS	Collaboration with specialty residents to interpret fetal monitoring. Use of advanced hemodynamic monitoring in obstetric patients.
2. Understand diagnostic modalities used in workup of the adult injured patient	Resuscitation of injured patients operative management under graded supervision.
3. Understanding thermal, electrical, inhalation and immersion injuries.	See BICU Goals and Objectives See PICU Goals and Objectives
4. Understanding injuries in and pathophysiology of multiply injured adolescent and pediatric patients.	Resuscitation of injured patients operative management under graded supervision.

X. Miscellaneous

Knowledge	Skills
1. Understand descriptive and computational biostatistics and principles of experimental design and evidence based therapy.	Select and critique articles for monthly journal club. Complete a retrospective research project from administrative database.
2. Understand principles of pharmacokinetics and pharmacodynamics.	In collaboration with SICU pharmacist prescribe medication dosed appropriately for organ function status.
3. Understand the use of specialty beds and device applications.	Employ prone therapy as salvage modality in ARDS. Apply pelvic binder for hemorrhagic control.

Conferences for the Fellow include:

1. Mandatory conferences of the Department of Surgery
2. Trauma QI and Morbidity and Mortality Conferences
3. Monthly SICU advanced lecture series
4. Monthly SICU Journal Club

Parkland BICU Goals and Objectives

Knowledge	Skills
1. Understand the resuscitation of patients with thermal burns with and without associated traumatic injury.	Application of burn resuscitation formulas to patients with thermal burns and instruction of junior residents in same.
2. Recognition of smoke inhalation injury by physical exam and use of ancillary diagnostic tools.	Use bronchoscopy to diagnose inhalation injury and apply standard and nonconventional ventilatory methods.
3. Understand principles of burn wound care, use of topical antibiotics and specialty wound care products. Understand care of patients with electrical burns, chemical burns and toxic epidermal necrolysis	Supervise junior residents in performance of escharotomies, fasciotomies and burn wound excision and grafting.
4. Appreciate the ancillary care of the burn patient including nutritional support, infection control and glucose management.	Order and supervise ordering of appropriate enteral and parental nutrition, antibiotics and strict glycemic control.

Children's Medical Center PICU Goals and Objectives

The rotation at Children's Medical Center of Dallas will focus on evaluation and management of critically ill and injured infants and children. The Fellow will be under the direct supervision of the Pediatric Trauma Medical Director but will work with the entire Pediatric Surgery Staff, Pediatric Emergency Medicine and Pediatric Critical Care services. The goal of the rotation will be to provide exposure to the physiologic and pathologic differences of infants, children and adolescents as well as strategies for management of these patients while in the intensive care unit. The fellow will participate in the evaluation and management of injured children in the Emergency Department and will be responsible for patient care in the 5A ICU. The Fellow will participate in scheduled lectures/conferences during the rotation that are pertinent to pediatric surgical critical care. The Director of the Pediatric Trauma Program will be responsible for the Resident's evaluation while on the service.

Knowledge	Skills
Cardiovascular System <ul style="list-style-type: none"> • Understand the fetal circulatory system and developmental anomalies of the heart. Understand how these various anomalies shunt blood and what the physiologic consequences are. • Understand how to estimate circulating blood volume and how children manifest shock and cardiac failure. • Understand the indication and action of pharmacologic agents for cardiac support • Understand the indications and physiology for ECMO. 	<ul style="list-style-type: none"> • Invasive and non-invasive monitoring techniques including central venous and arterial access. • Calculate circulating blood volume and fluid requirements.
Respiratory System <ul style="list-style-type: none"> • Understand the pathophysiology, indications for and complications associated with various 	<ul style="list-style-type: none"> • Correctly interpret Pediatric Chest X-rays. • Airway management including rigid

<ul style="list-style-type: none"> • Understand the pathophysiology of various congenital abnormalities that affect ventilation. 	<ul style="list-style-type: none"> • Demonstrate correct set-up of a pediatric ventilator.
<p>Fluid/Electrolytes/Renal System</p> <ul style="list-style-type: none"> • Understand calculations of circulating blood volume, fluid and electrolyte requirements per weight and body surface area. • Understand glomerular filtration and renal concentrating ability of the kidney for children of various ages. 	<ul style="list-style-type: none"> • Correctly estimate patients weights based on age and body habitus. • Demonstrate proficiency in TPN management. • Evaluate renal function for patients of difference ages.
<p>Metabolic/Nutrition/Endocrine System</p> <ul style="list-style-type: none"> • Understand metabolic (caloric, protein, lipid) needs for children of various ages. • Understand the changes in metabolic demand with various forms of injury and stress. • Understand the common endocrine abnormalities seen with injury and stress in children. 	<ul style="list-style-type: none"> • Correctly assess a child's nutritional status and needs. • Correctly determine feasibility of enteral nutrition • Correctly monitor patients on parenteral nutrition.
<p>Infection/Immunity</p> <ul style="list-style-type: none"> • Understand the treatment of the most common types of infections in the pediatric patient. • Understand drug dosing in the pediatric population. • Understand how the relative immune deficiency of the infant and injured child contributes to the likelihood of infection. • Understand the role of immunizations in children. 	<ul style="list-style-type: none"> • Classify infections and application of isolation techniques. • Demonstrate understanding of immunization schedules. • Correctly interpret culture data and use antibiotics appropriately.
<p>Hematologic System</p> <ul style="list-style-type: none"> • Understand the indication and administration of blood and blood products in children. • Understand the factors associated with abnormal bleeding in children. • Understand the more common hematologic diseases that affect bleeding in children. 	<ul style="list-style-type: none"> • Appropriate use of component therapy for patients with abnormal bleeding. • Appropriate transfusion of blood. • Correctly estimate circulating blood volume. • Demonstrate correct treatment of common inherited bleeding disorders.
<p>Neurologic System</p> <ul style="list-style-type: none"> • Understand the physiology of brain injury in children. • Understand the management of increased intra-cranial pressure in children. 	<ul style="list-style-type: none"> • Performance of a complete neurological examination in children of various ages. • Interpretation of EEG data • Interpretation and trouble-shooting of intra-cranial pressure monitoring.
<p>Gastrointestinal/Hepatic System</p> <ul style="list-style-type: none"> • Understand the most common sources of gastro-intestinal bleeding in children. • Understand the pathophysiology of short-gut syndrome in children. • Understand the management and evaluation of solid organ injury in children. • Understand the management of suspected bowel injuries in children. 	<ul style="list-style-type: none"> • Appropriate utilization of gastrointestinal intubation techniques including endoscopy. • Appropriate grading of solid organ injuries. • Management of stomas, fistula and percutaneous catheter devices.

<p>Development/Abuse/Neglect</p> <ul style="list-style-type: none"> • Understand the appropriate developmental milestones in children. • Develop age appropriate physical exam skills • Understand the signs and symptoms of abuse/neglect. • Understand the work-up of suspected physical and sexual abuse. 	<ul style="list-style-type: none"> • Accurately identify developmental milestones in children. • Accurately identify Tanner stages in children. • Complete the abuse assessment sheet and CPS affidavit • Interpret a skeletal survey and retinal exam for hemorrhages.
<p>Administration/Ethics</p> <ul style="list-style-type: none"> • Understand the legalities of end-of-life issues including withdrawal of support, organ donation in children. • Understand the role of the surgeon in the Pediatric ICU. • Understand the criteria for admission and discharge from the ICU. • Understand the Performance Improvement process. • Understand the ACS guidelines for Pediatric Trauma Centers. 	<ul style="list-style-type: none"> • Demonstrate a brain-death exam in a child. • Participate in a family care conference. • Participate in the Trauma PI program.

Conferences for the Fellow:

1. Mandatory conferences for the Department of Surgery and BTCC
2. Pediatric Trauma PI and M&M
3. ER/Pre-Hospital M&M

**East Texas Medical Center (ETMC)
Goals and Objectives**

Knowledge	Skills
<p>Understand the management of the RURAL TRAUMA patient. Appreciate the impact of prolonged prehospital transport times and unique mechanisms of injury in this population in a clinical setting (a Level I ACS-verified trauma center) without additional trainees.</p>	<p>Resuscitate and provide ICU care to injured patients in this setting under the direct supervision of surgeons; perform data-driven retrospective research on a rural trauma patient population trained by surgeons with Added Qualifications in Surgical Critical Care.</p>
<p>Understand the management of the THORACIC Trauma patient in a setting without additional trainees. Appreciate the various diagnostic modalities to evaluate for aortic, pulmonary, cardiac, esophageal and chest wall injury.</p>	<p>Participate in the resuscitative and operative care of the patient with thoracic trauma including</p> <ul style="list-style-type: none"> • thoracoscopic/minimally invasive evaluation for bleeding, hematoma • thoracotomy/sternotomy with open repair.