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Evaluation & Management of a Trauma Patient

Description of the Activity	Trauma is a common clinical problem encountered by pediatric surgeons. The pediatric surgeon should be able to triage, diagnose, and treat injured patients and understand when local resources require consultation of additional health care providers or transfer to a higher level of care. The pediatric surgeon is expected to assess, stabilize, and treat patients in the emergency department as their condition warrants.
Functions	❖ Trauma bay: ➢ Activate the trauma response based on the projected acuity of the patient as described by prehospital personnel. ➢ Manage the trauma bay receiving area, including room setup, equipment check (Breslow tape, guided resuscitation equipment, fluid warmers and rapid infusers, thoracotomy instrumentation and chest tube insertion sets, chest tubes, central line kits, Foley catheters, nasogastric tubes). ➢ Ensure the room is at a temperature regulated to receive a trauma patient and recognize the potential cold sensitivity in infants. ➢ Manage personnel and ensure adequate staffing, including nursing, pharmacy, and transport, for the safe management of trauma patients. ➢ Delegate responsibilities as necessary. ➢ Receive the trauma patient from emergency medical services or other transport teams with adequate debriefing of the injury mechanism and resuscitation status. ➢ Transfer the patient to the trauma bay, taking precautionary measures to prevent iatrogenic injury, ensure adequate pain control, and alleviate anxiety in the trauma patient using Child Life or other resources. ❖ Primary survey: ➢ Confirm patency of the patient's airway. Remove debris from the oral cavity, including loose teeth, blood, and secretions, using a chin lift or jaw thrust maneuver. ➢ Perform advanced airway methods such as intubation, cricothyroidotomy, or tracheostomy as necessary. ➢ Assess breathing by inspecting and auscultating the chest. Manage sucking chest wounds using occlusive dressing taped on 3 sides. ➢ Diagnose a pneumothorax by clinical findings, and confirm on chest x-ray if necessary. Decompress with a tube thoracostomy. ➢ Evaluate circulation by assessing capillary refill and age-appropriate heart rate and blood pressure. Establish venous access by cannulation, cut down, central venous, or intraosseous access. Activate the massive transfusion protocol if necessary. ➢ Perform disability assessment and prevention of secondary injury by assessing the pediatric Glasgow Coma Scale score, ensuring satisfactory oxygenation and perfusion, maintaining C-spine precaution, and using a log roll until the thoracolumbar spine can be cleared. Clear a cervical spine to allow for collar removal in an awake pediatric patient. ➢ Assess exposure, recognizing higher ambient temperature needs in infants and toddlers. ➢ Provide pain control and alleviate anxiety, using Child Life expertise if available. ➢ Recognize the importance of decreasing exposure to radiation in the form of unnecessary computed tomography scans and use alternate imaging modalities.

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- Use Breslow tape to determine the size of equipment to be used in resuscitation.
- Order and interpret laboratory tests and imaging (following ALARA [“as low as reasonably achievable”] protocols) based on a patient's clinical presentation.
- Perform a secondary survey. When able, obtain a history and physical, and elicit pertinent positive and negative signs and symptoms. Determine if additional diagnostic evaluation should be obtained.
- Consider history and comorbidities that can modify patient care, including:
  - Bleeding and clotting disorders
  - Chronic health conditions (cardiac history, asthma, previous surgery, cancer)
  - Differently abled children with special needs
  - Recognition of nonaccidental trauma (NAT)
- HEENT (head, eyes, ears, nose, and throat):
  - Assess for signs of severe head injury and raised intracranial pressure, bleeding from the ear, and cerebrospinal fluid otorrhea/rhinorrhea.
  - Prevent the development of secondary brain injury due to elevated intracranial pressure, hypoxia, or hypovolemia.
  - Assess ocular movement and integrity of vision, recognizing entrapment.
  - Identify fractures of nasal and facial bones, recognizing their impact on the patient’s airway. Identify Le Fort fractures.
  - Assess for fractures of the maxilla and the mandible and loose teeth.
  - Maintain C-spine precautions. Evaluate for penetrating neck injury and the integrity of the aerodigestive track as well as vascular structures in the neck.
- Chest:
  - Assess chest wall integrity and the presence of pneumothorax and sucking chest wounds.
  - Assess for flail chest and paradoxical respiration.
  - Evaluate for diaphragmatic integrity. Consider placing a nasogastric or orogastric tube after excluding base of skull injury to decompress the stomach.
  - Recognize the signs of respiratory failure due to trauma and the need for intubation.
  - Assess for signs of cardiac contusion and pericardial effusion, and obtain an electrocardiogram if there is a concern. Look for evidence of penetrating cardiac trauma.
  - Recognize the signs of major vessel injury in the chest on chest x-ray imaging.
  - Manage a hemothorax, and be aware of the need to activate the operating room if initial drainage is significant or there is ongoing drainage (e.g. based on weight parameters).

- Abdomen/pelvis:
  - Use E-FAST (Extended Focused Assessment with Sonography in Trauma) to evaluate for blood in the peritoneal cavity.
  - Examine the pelvis and perineum, and be aware of signs of urethral transection such as blood at the meatus or a floating prostate.
  - Diagnose blunt splenic trauma, with awareness of the ATOMAC (Arizona-Texas-Oklahoma-Memphis-Arkansas Consortium) protocol to decrease blood draws, start early mobilization, and discharge all patients but those with the most severe splenic trauma grades. Recognize physiological instability as a guide to intervention.

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- Recognize the importance of splenic conservation in children.
- Diagnose blunt liver injury with awareness of ATOMAC guidelines in managing liver injury, including minimizing laboratory draws and performing early mobilization and discharge in all patients but those with the most severe liver trauma grades. Recognize physiological instability as a guide to intervention.
- Use interventional radiology procedures when available, such as coil and gel foam embolization in severe liver and spleen injuries that are hemodynamically stable.
- Perform nonoperative management of blunt renal injury. Document the grade and assessment of pelvicalyceal injury. Evaluate for urine leak by further imaging if necessary.
- Diagnose blunt and penetrating hollow viscus injury, and determine the need for surgical intervention.
- Diagnose open and high-grade pelvic fractures. Use a pelvic binder to reduce bleeding. Consider referral for early fixation in patients with unstable ring fractures or open fractures. Consider embolization in pelvic fractures/bleeding. Consider injury to the bladder, urethra, and pelvic vessels.
- Determine the level of care based on patient acuity (pediatric intensive care unit vs floor).
- Musculoskeletal and soft tissue injury:
  - Provide washout and antibiotics promptly for patients with open fractures.
  - Stabilize fractures to minimize pain, and perform early intervention using splints and other adjuncts as necessary and by internal or external fixation after orthopedic consultation.
  - Determine if there are associated vascular or neurological injuries, and set expectations with the family and other members of the health care team.
  - Diagnose a mangled extremity and provide wound care in the immediate setting. Employ a multidisciplinary team for limb salvage if possible.
- NAT:
  - Recognize injury patterns that are indicative of NAT, including:
    - Evidence of frequent previous injuries or healed fractures of different ages in the absence of osteogenesis imperfecta
    - Injury to the genital or perianal area
    - Multicolored bruising
    - Perioral injuries
    - Retinal hemorrhage
    - Ruptured internal viscera without antecedent trauma
    - Skull or rib fractures in children younger than 24 months
  - Ensure the safety of the child from ongoing abuse and exposure to the perpetrator.
  - Involve social work and activate child protection services or law enforcement to investigate as necessary.
  - Develop care coordination with other specialists as necessary, including a pediatric abuse specialist, ophthalmologist, child psychologist, other state agencies, and Child Life.
- Burn injury:
  - Recognize inhalation injury, and plan to secure the airway early.

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- Start resuscitation in patients with more than 10% body surface area (BSA) after diagnosing the percentage of BSA that is burned using the Lund and Browder chart and identifying the greater percentage allocated to facial burn.
- Start prophylactic antibiotic treatment (single dose) and tetanus toxoid if necessary.
- Recognize burn criteria that warrant transfer to a burn center, including:
  - Burn greater than 5% BSA
  - Burn involving the face, hands, feet, or perineum or over a joint
  - Circumferential burn
  - Inhalation injury or part of polytrauma
  - Nonaccidental burn
  - Electrical and chemical burns
- Use either the Brooke or Parkland formula to begin resuscitation in all children with greater than 10% BSA burns using clinical endpoints for volume resuscitation.
- Address pain control and anxiety associated with burn dressing changes.
- Optimize temperature in treatment areas, recognizing that patients with burns are predisposed to hypothermia with loss of skin integrity.
- Be aware of indications for early burn wound excision and grafting and options for skin coverage, including meshed autograft, meshed allograft, and other artificial skin substitutes.
- Recognize burn wound sepsis early, and develop a plan to manage it.

- Burn injury procedures:
  - Identify the need for and safely perform or delegate indicated bedside procedures, including but not limited to:
    - Advanced airway management
    - Application of a pelvic binder or tourniquet
    - Arterial line placement
    - Arterial puncture for arterial blood gases
    - Central line placement
    - Chest tube placement
    - Debridement and closure of skin and scalp lacerations
    - E-FAST
    - Foley catheter placement
    - Splinting/traction
    - Resuscitative thoracotomy

❖ Abdominal trauma:
- Determine the operative approach (laparoscopy versus open).
- Safely access the abdominal cavity. Control hemoperitoneum using 4-quadrant packing. Control enteral contamination by stapling or suturing.
- Communicate with the anesthesia team and operating room support staff, and allow time for resuscitation to catch up.

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- Perform methodical inspection of all quadrants of the peritoneal cavity, including evaluation of the retroperitoneal duodenum, and enter the lesser sac to evaluate the posterior wall of the stomach, body and neck of the pancreas, and the hilum of the spleen.
- Diagnose hollow viscus injury in patients with blunt and penetrating trauma, and manage small and large bowel injuries. Identify when to perform damage control versus anastomosis. Identify the indications for colon resection anastomosis versus colostomy.
- Manage splenic injury, and use spleen preservation techniques, including splenorraphy and partial splenectomy.
- Manage major liver injury, including concepts of hepatorrhaphy, selective debridement, selective hepatic artery ligation, perihepatic packing, and other techniques.
- Manage pancreatic and duodenal penetrating and blunt trauma using distal pancreatectomy, pyloric exclusion, triple-tube technique, and other rare procedures.
- Manage intraperitoneal and extraperitoneal bladder rupture.
- Manage retroperitoneal hematomas in blunt and penetrating injuries, recognizing the importance of classifying hematomas as midline, lateral, and pelvic retroperitoneal hematomas.
- Select sutures and close the fascia, or apply temporary abdominal closure techniques.
- Recognize injury to the kidney and pelvis, and consider additional imaging to determine interventions for urine leak such as placement of a ureteral stent.

❖ Thoracic trauma:

- Determine the operative approach (thoracoscopy vs thoracotomy).
- Position the patient for access, providing adequate padding for bony prominences. Access the thoracic cavity.
- Manage traumatic diaphragmatic injury in the setting of blunt trauma and penetrating trauma. Use suture material in repairs of the diaphragm.
- Perform resuscitative thoracotomy in exsanguinating intrathoracic hemorrhage, open cardiac massage, evacuation of tamponade, and cross-clamping of the descending aorta to allow for ongoing resuscitation in major abdominal trauma.
- Manage cardiac tamponade by ultrasound/echocardiography-guided subxiphoid drainage and placement of a pigtail catheter in the pericardial space.
- Manage tracheobronchial injuries and disruption. Demonstrate understanding of the concept of selective intubation and delayed management.

❖ Neck trauma:

- Recognize the zones of neck injury:
  - Zone 1: between the clavicles and the cricoid
  - Zone 2: between the cricoid and the angle of the mandible
  - Zone 3: superior to the angle of the mandible
- Manage zone 2 injuries that penetrate the platysma by surgical exploration, recognizing the anatomy of the neck. Expose and control vascular structures that are injured, and repair or ligate vessels as indicated. Expose the cervical esophagus, and repair esophageal injury. Repair tracheal injury. Involve other specialists as indicated.

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	❖ Extremity trauma: ➢ Develop a collaborative approach with the orthopedic and plastic surgery teams. If necessary, collaborate with the vascular surgery team. ➢ Manage wounds, and perform debridement with careful evaluation of viable and nonviable structures and preservation of function. ➢ Evaluate elevated compartment pressures, and recognize the need for fasciotomy. ❖ Transition of care: ➢ Recognize and triage patients with hemodynamic instability who need to be taken to the operating room immediately. ➢ Determine the disposition of the patient. ➢ Communicate a postoperative treatment plan to other health care team members, considering location, postoperative needs, outcome expectations, and follow-up. Discuss the plan with the patient's family/caregiver(s). ➢ Manage postoperative patient resuscitation, and determine the timing of return to the operating room for patients who have undergone damage control laparotomy. ➢ Anticipate and try to prevent complications that can delay recovery in a trauma patient, including secondary brain injury, pressure ulcers, and deep vein thrombosis. ➢ Complete a tertiary survey, and remain vigilant for potentially missed injuries. Consult with additional services based on identified associated injuries. ➢ Maintain awareness of the social determinants of trauma.
Scope	❖ In scope • Diagnoses ▪ Blunt trauma ▪ NAT ▪ Penetrating trauma • Procedures ▪ Damage control laparotomy ▪ Laparoscopy ▪ Pericardial window ▪ Pericardiocentesis ▪ Thoracoscopy ▪ Trauma exploratory laparotomy

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	❖ Out of scope • Diagnoses/procedures ▪ Nontraumatic injury ▪ Patients >18 years of age

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Level	Trauma Bay	Procedures	Transition of Care
1 **Framework:** The learner demonstrates understanding of information and has basic skills What a new pediatric surgery fellow should know Entrustment: The attending will show and tell or the learner acts as first assistant.	• With active guidance, gathers prehospital information for a stable prehospital pediatric trauma patient • With active guidance, prepares the trauma bay with equipment and personnel for a straightforward trauma resuscitation • With direct supervision, gathers relevant information from the patient, family and prehospital personnel, and performs an ATLS/PALS survey for a non-critically ill patient • With direct supervision, develops a differential for a non-critically ill pediatric trauma patient • With active guidance, orders and interprets routine diagnostic studies for a pediatric trauma patient, including radiologic and lab evaluations, exhibiting awareness of the need to limit radiation exposure in children • With active guidance, initiates fluid resuscitation in a pediatric patient with trauma or burns; demonstrates limited awareness of risks for inhalational injury and criteria for burn center transfer • With active guidance, recognizes when a patient may need procedural or operative intervention based on significant changes in vital signs and considers hemorrhagic shock in a hypotensive trauma patient	• With direct supervision, intervenes on a nonoperative pediatric trauma patient with straightforward problems (eg, sutures lacerations, debrides contaminated wounds, applies bandages) • With direct supervision, performs a FAST exam when appropriate and interprets the findings • With direct supervision, performs resuscitative trauma bay procedures (airway management, IV access, thoracostomy) in a pediatric trauma patient • With active guidance, implements nonoperative management in pediatric solid organ trauma and recognizes when intervention in the form of IR embolization or surgery is necessary • With active guidance, performs exploration of simple neck trauma without major vascular or aerodigestive tract penetration • Functions as a first assistant for maximally invasive procedure such as resuscitative thoracotomy, rapid access to an abdominal cavity, cross- clamping the aorta, 4- quadrant packing, and damage control principles	• Communicates to a patient/family and healthcare team with cultural humility and provides timely updates • Places indicated consults for a pediatric trauma patient who is not critically ill • With active guidance, accurately documents trauma resuscitation • Participates in trauma debriefs with active guidance • Performs effective handoff to the healthcare team of a trauma patient who is not critically ill • With direct supervision, initiates the process of floor/ICU admission or transition to the OR for nonemergent care of a stable patient • With active guidance, applies national best practice guidelines for the management of a pediatric trauma patient • With active guidance, elicits patient and family preferences and incorporates their needs into a plan for transition of care after pediatric trauma in an uncomplicated patient • With active guidance, performs an effective handoff to a rehab unit or

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Level	Trauma Bay	Procedures	Transition of Care
	• With active guidance, identifies social disparities in health, including the identification of children at risk for NAT	• Requires active guidance to communicate with the OR and subspecialty teams regarding the need for transition to the OR and the priorities of operative management by multiple services • With direct supervision, performs a burn dressing change, recognizing the need for excision and grafting	home care delivery system for a patient recovering from a complex injury • With active guidance, implements a care plan that considers the priorities of multiple injuries • With active guidance, communicates with all health care team members and coordinates complex care plan discussions for a pediatric trauma patient • With active guidance, identifies system factors that can impact pediatric trauma patient safety and lead to deviation from best practice guidelines
2 **Framework:** The learner demonstrates understanding of the steps of the operation but requires direction through principles and does not know the nuances of a basic case Entrustment: The learner can use the tools but may not know exactly what, where, or how to do it.	• With indirect supervision, gathers prehospital information for a stable prehospital pediatric trauma patient • With indirect supervision, prepares the trauma bay with equipment and personnel for a straightforward trauma resuscitation • With indirect supervision, gathers relevant information from the patient, family and prehospital personnel, performs an ATLS/PALS survey for a non-critically ill patient • With indirect supervision, develops a comprehensive differential for a non-critically ill pediatric trauma patient	• With indirect supervision, intervenes on a nonoperative pediatric trauma patient with straightforward problems (eg, sutures lacerations, debrides contaminated wounds, applies bandages) • With indirect supervision, performs a FAST exam and interprets normal and obviously abnormal findings • With indirect supervision, performs a trauma bay resuscitative procedure in a pediatric trauma patient such as airway management, central line, or thoracostomy • With indirect supervision, implements nonoperative management in pediatric solid organ trauma and recognizes when	• Customizes communication to a patient/family and healthcare team about management plans, considering personal/systemic biases; addresses some elements when discussing expected outcomes and the anticipated treatment course • Independently implements consultant recommendations and leads interdisciplinary communication in the care of a non–critically ill pediatric trauma patient • With direct supervision, provides timely and complete communication in the medical record for members of the health care team

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The attending gives active help throughout the case to maintain forward progression or may need to take over the case at a certain point	• With indirect supervision, orders and interprets routine diagnostic studies for a pediatric trauma patient, including radiologic and lab evaluations, exhibiting awareness of the need to limit radiation exposure in children • With indirect supervision, initiates fluid resuscitation in a pediatric patient with trauma or burns, recognizes inhalational burn injury, and demonstrates knowledge of the criteria for burn center transfer • With passive guidance, recognizes when a patient may need procedural or operative intervention based on significant changes in vital signs and considers hemorrhagic shock in a hypotensive trauma patient • With indirect supervision, identifies social disparities in health, including the identification of children at risk for NAT	intervention in the form of IR embolization or surgery is necessary • With indirect supervision, performs exploration of simple neck trauma without major vascular or aerodigestive tract penetration • With direct supervision performs maximally invasive procedure such as resuscitative thoracotomy, rapid access to an abdominal cavity, cross- clamping the aorta, 4- quadrant packing, and damage control principles • With direct supervision, manages communication with the OR and subspecialty teams regarding the need for transition to the OR and the priorities of operative management by multiple services • With indirect supervision, performs a burn dressing change, recognizing the need for excision and grafting	• With direct supervision, leads the trauma debrief process • With direct supervision, communicates with all pediatric trauma team members regarding next steps in trauma management • With direct supervision, initiates the process of floor/ICU admission or transition to the OR for nonemergent care of a stable patient • With passive guidance, applies national best practice guidelines for the management of a pediatric trauma patient and considers priorities of multiple injuries • With indirect supervision, elicits patient and family preferences and incorporates their needs into a plan for transition of care after pediatric trauma in an uncomplicated patient • With direct supervision, performs an effective handoff to a rehab unit or home care delivery system for a patient recovering from a complex injury • With direct supervision, implements a care plan that considers the priorities of multiple injuries • With direct supervision, communicates with all health care team members and coordinates complex care plan

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			discussions for a pediatric trauma patient • With direct supervision, identifies system factors that can impact pediatric trauma patient safety and lead to deviation from best practice guidelines
3 **Framework:** The learner has a good understanding of surgical options and techniques but does not recognize abnormalities and does not understand the nuances of a complicated case Entrustment: The learner can perform the operation/task independently in the uncomplicated patient or The attending provides passive/indirect supervision/suggestions in the complicated patient but still allows the learner to perform the operation/task themselves	• With indirect supervision, gathers information from a prehospital provider or OSH information for a critically ill pediatric trauma patient • With indirect supervision, prepares the trauma bay with equipment and personnel for resuscitation of a critically ill pediatric trauma patient • With indirect supervision, gathers all relevant clinical information and performs ATLS/PALS on a critically injured pediatric trauma patient using an evidenced-based protocolized approach • With indirect supervision, develops a comprehensive differential for a critically ill pediatric trauma patient • With indirect supervision, orders and interprets all diagnostic studies, including radiologic and lab evaluations, for a pediatric trauma or NAT patient, exhibiting awareness of the need to limit radiation exposure and blood draws • With indirect supervision, initiates fluid resuscitation in a pediatric patient with	• With indirect supervision, intervenes on a nonoperative trauma patient with more complex problems (eg, venous access by cutdown or IO access, splinting, pelvic binder application) • With indirect supervision, performs a FAST exam and identifies subtle anomalies, adjusting technique and considering patient-specific factors and mechanism of injury • With indirect supervision, performs a complex pediatric resuscitative bedside procedure using resources like pediatric sedation protocols and child life (eg, airway management, central line placement and tube thoracostomy) • With indirect supervision, implements nonoperative management in pediatric solid organ trauma and initiates intervention in the form of IR embolization or surgery as necessary • With indirect supervision, repairs major aerodigestive tract injury and adjacent	• Communicates patient care information with cultural humility to the family and healthcare team of a complex pediatric trauma patient • Independently implements consultant recommendations and leads interdisciplinary communication in the care of a critically ill pediatric trauma patient • With indirect supervision, provides timely and complete communication in the medical record for members of the health care team • Provides feedback to team members about performance and independently leads the debrief process (ICS2 L3, P3 L3, SBP2 L3) • With indirect supervision, communicates with all team members regarding the next steps in trauma and NAT; involves social services and other state resources in addressing the safety of the injured patient

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	trauma or burns, secures the airway in inhalational injury, and articulates the criteria for burn center transfer ● With indirect supervision, recognizes when a pediatric trauma patient needs an operative or procedural intervention by responding to subtle changes in vital signs and initiates a massive transfusion protocol when indicated ● With indirect supervision, recognizes and individualizes care for at-risk pediatric trauma patients, including patients experiencing burns, NAT, and social disparities in health	vascular injury in major head and neck trauma ● Requires indirect supervision for a maximally invasive procedure such as resuscitative thoracotomy, rapid access to an abdominal cavity, cross-clamping the aorta, 4-quadrant packing, and damage control principles ● With indirect supervision, manages communication with the OR and subspecialty teams regarding the need for transition to the OR and the priorities of operative management by multiple services ● With indirect supervision, performs burn wound excision and grafting	● With indirect supervision, initiates floor/ICU admission or transition to the OR for a complex pediatric trauma patient ● With indirect supervision, applies national best practice guidelines to address a pediatric trauma patient's comprehensive needs and analyzes outcomes ● With indirect supervision, elicits patient and family preferences and incorporates their needs into a plan for transition of care after pediatric trauma in a complicated patient ● With indirect supervision, performs an effective handoff to a rehab unit or home care delivery system for a patient recovering from a complex injury ● With indirect supervision, implements a care plan that considers the priorities of multiple injuries ● With indirect superivsion, clearly communicates with all health care team members and coordinates complex care plan discussions for a pediatric trauma patient ● With indirect supervision, identifies system factors that can impact pediatric trauma patient safety and attempts to

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			mitigate deviation from best practice guidelines
4 **<u>Framework</u>:** The learner has a strong and indepth understanding of surgical options and techniques <u>Entrustment</u>: Can perform the operation/task independently in complicated cases or The attending may need to provide indirect supervision or suggestions in the context of extremely rare or severely complicated cases	• Independently synthesizes prehospital data and leads a trauma team for a pediatric trauma patient • Independently prepares the trauma bay with equipment and personnel for a pediatric trauma patient • Independently gathers all relevant clinical information and performs ATLS/PALS for a pediatric trauma patient using an evidence-based protocolized approach that individualizes care and recognizes when deviation from protocol is necessary; identifies missed injuries • Independently develops a comprehensive differential for a critically ill pediatric trauma patient • Independently orders and interprets diagnostic studies for a pediatric trauma patient or NAT patient, limiting cross-sectional imaging, using alternative imaging technology to decrease radiation exposure, and limiting blood draws • Independently initiates fluid resuscitation in a pediatric patient with trauma or burns, secures the airway in inhalational injury, and initiates burn center transfer as indicated	• Leads and independently intervenes on a nonoperative trauma patient with complex problems • Independently adjusts technique to perform and interpret a FAST exam, considering patient-specific factors and mechanism of Injury • Independently performs a bedside resuscitative procedure, requiring passive assistance for maximally invasive procedures such as resuscitative/clamshell thoracotomy or cross-clamping the aorta) • Independently implements nonoperative management in pediatric solid organ trauma, including intervention in the form of IR embolization or surgery as necessary • Independently performs neck exploration/endoscopy, requiring assistance with corrective procedures in major neck trauma • Independently performs maximally invasive procedures, such as resuscitative thoracotomy, rapid access to an abdominal cavity, cross-clamping the aorta, 4-quadrant packing, and damage control principles	• Empathetically delivers emotionally difficult news (eg, changes to the operative plan, adverse outcome, end-of-life discussion) to a patient and family with cultural humility, negotiating conflicts with the patient/family or health care team and facilitating goals-of-care discussions • Coordinates and leads the identification and placement of indicated consults and integrates recommendations for a pediatric trauma patient • Independently reviews and provides feedback about documentation in the medical record • Leads trauma debriefs and provides counseling when necessary • Independently coordinates the transfer of a patient to a long-term or home care setting and effectively navigates barriers for a NAT victim or a patient with limited social and economic resources • Leads and coordinates admission to the floor/ICU or transition to the OR for all trauma patient

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	• Independently manages all aspects of a critically ill pediatric trauma patient, including initiation of a massive transfusion protocol • Independently recognizes and individualizes care for at-risk pediatric trauma victims, including patients experiencing burns, NAT, and social disparities in health	• Manages communication with the OR and subspecialty teams regarding the need for transition to the OR and the priorities of operative management by multiple services • Independently manages burns and burn wound sepsis by burn wound excision and grafting, with awareness of skin replacement options	• Critically appraises evidence and integrates national best practice guidelines in local management protocols, tailoring recommendations to a pediatric trauma patient • Independently elicits patient and family preferences and incorporates their needs into a plan for transition of care after pediatric trauma in a complicated patient • Independently performs an effective handoff to a rehab unit or home care delivery system for a patient recovering from a complex injury • Independently implements a care plan that considers the priorities of multiple injuries in a critically ill patient • Independently maintains clear communication in high-stress situations with health team members and provides constructive feedback to supervisors • Independently Identifies system factors that can impact pediatric trauma patient safety and mitigates deviation from best practice guidelines