Clinical Pathways Program

Guideline: TRAUMA ACTIVATION, PEDIATRIC

Updated: August 23, 2022

Clinical guideline summary

PATIENT POPULATION AND DIAGNOSIS: Pediatric Trauma Activation Criteria: Age < 18 years

APPLICABLE TO: Helen DeVos Children's Hospital

BRIEF DESCRIPTION: Formally designate the process of activating a trauma response.

OVERSIGHT TEAM LEADER(S): Dr. James DeCou

OWNING EXPERT IMPROVEMENT TEAM (EIT): N/A

MANAGING CLINICAL PRACTICE COUNCIL (CPC): Children's Health

CPC APPROVAL DATE: 9/15/22

LAST REVISED: 8/23/22

FOR MORE INFORMATION, CONTACT: James DeCou

Clinical pathways clinical approach

TREATMENT AND MANAGEMENT:

Pediatric Trauma Activation Criteria: Age < 18 years
Level 1 Pediatric Trauma Activation Criteria:

- Intubated patients transferred from the scene OR transferred from outside facility with GCS ≤8 prior to intubation
- Patients who have respiratory compromise or are in need of an emergent airway
    - Includes intubated patients who are transferred from another facility with ongoing respiratory compromise (does not include patients intubated at another facility who are now stable from a respiratory standpoint)
- Confirmed age-specific hypotension: Systolic blood pressure less than 70 mm Hg + (2 X age in years)
- Transfer patients from other hospitals receiving blood to maintain vital signs
- Glasgow Coma Score ≤ 8 with mechanism attributed to trauma
- Presence of paralysis or suspected spinal cord injury

- Penetrating injury to the head, neck, chest, abdomen
- Partial or complete amputation proximal to wrist or ankles
- Discretion of ED physician

Level 2 Pediatric Trauma Activation Criteria:
Does not meet any Level 1 criteria, plus any of the below:

- Stable intubated patient transferred from outside facility with GCS ≥9 prior to intubation (HDVCH Trauma Attending and ED Attending must be in agreement of this plan)
- Two or more long bone fractures
- Injury to the limb requiring a tourniquet
- Pregnancy greater than 20 weeks (notify OB Charge (x75509) prior to arrival)
- Ejection from enclosed vehicle
- Death of occupant in same vehicle
- Auto versus pedestrian/bike at >20 mph or run over
- Motorcycle/ATV/snowmobile crash at >20 mph
- Falls >10 feet (or 3 x patient's height)
- Glasgow Coma Score 9-12 with mechanism attributed to trauma
- Discretion of ED physician

Level 3 pediatric trauma team consultation criteria:
Does not meet any Level 1 or Level 2 criteria
Consult the pediatric trauma service for any patient with multisystem trauma injuries requiring trauma evaluation, including suspected non-accidental trauma, non-isolated severe traumatic brain injury, injured patients requiring admission to non-surgical services, and patients with blunt abdominal injury with firm or distended abdomen or abdominal seatbelt sign. Any patient with a trauma mechanism transferring from the scene or an emergency department should be seen first in the HDVCH or Butterworth Emergency Department.

Adult Activation Criteria patients ages 18+.

Activation Level Changes:
Upgrading activation level:

- Any trauma patient may be upgraded to a Trauma 1 or 2 at any time after arrival based on updated EMS information or change in the clinical presentation that require resources to the bedside.

Downgrading activation level:

- Downgrading of activations is discouraged. If the patient was inappropriately activated, then the activation can be cancelled but there must be physician documentation in the chart explaining the downgrade or cancellation of the activation level.

Activation Process:
Upon receiving notification by EMS or HDVCH Direct of a patient meeting criteria for pediatric trauma activation, a trauma team activation process will be implemented. At the direction of the emergency department charge nurse or physician, the emergency department unit secretary will send the activation page via the notification system, which will include level of activation, estimated time of arrival, and a brief description of the trauma. The pediatric group phone paging system will be used as a backup, and will include a numeric code for trauma activation level, destination, and estimated arrival time. See example below.

Example: **1*1680*2130 → Level 1 Trauma Code at Trauma Bay arriving at 2130**
2*71090*0100 → Level 2 activation at HDVCH ED arriving at 0100

Level 1 trauma team activation “Trauma Codes” with advance notice will be directed to and initially managed in the Butterworth Trauma Bay. The adult trauma surgeon and trauma team will respond to all Level 1 Trauma Codes to the department indicated by the pager and will manage patient care. The adult trauma surgeon will be relieved after giving report to the pediatric trauma surgeon. When the pediatric trauma surgeon is physically present, the location of the trauma code may be at their discretion, in consultation with the ED physician. A patient may be upgraded at any time using the above process.

Transfer from Referring Hospital:

- Spectrum Health Transfer Center is to be utilized to provide structured process for communication with the trauma surgeon, and regional providers for trauma patients transfer to Spectrum Health Butterworth (SHBW) or Spectrum Health Helen DeVos Children’s Hospital (SH HDVCH)
- Spectrum Health Transfer Center will PerfectServe the on-duty pediatric trauma surgeon to speak directly with the referring facility provider. The trauma surgeon will determine the activation level based on the above activation criteria and referring facility patient report. The Transfer Center nurse will document key information in the conversation and the requested activation level in the Transfer Center Epic intake note.

Response Times:

Level 1 trauma team activation “Trauma Code:”

Pediatric trauma surgeon and trauma team must report to the bedside immediately. If unable to immediately attend the activation, the pediatric trauma surgeon must call the adult trauma surgeon (**267-4036**) to communicate his or her arrival time.

Level 2 trauma team activation “Immediate Trauma Consult:”

Trauma team must report to the bedside immediately. Discussion of the patient will then occur within 15 minutes of notification, directly between the trauma surgeon, the emergency attending, and the trauma resident. The emergency department physician will manage patient care until relieved by the pediatric trauma surgeon or another admitting physician. *Patient may only be downgraded to an evaluation or consult by the attending present at the bedside of the patient.* Documentation of the notification and response from the trauma surgeon will be documented in the EMR by the emergency department team for performance tracking.

Level 3 Evaluation “Trauma Consult:”

Response to trauma evaluation will be per Medical Staff Rules and Regulations for consults.

Request for Neurosurgical response within 30 minutes of notification

Trauma patients with the following clinical scenarios require an assessment within 30 minutes of request:

- Severe TBI (GCS less than 9) with head CT evidence of intercranial trauma
- Moderate TBI (GCS 9-12) with head CT evidence of potential intracranial mass lesion
- Neurological deficit as a result of potential spinal cord injury (applicable to spine surgeon, whether a neurosurgeon or orthopedic surgeon)
- Trauma surgeon discretion

*Neurosurgical consultation can be completed by a neurosurgery resident or APP as long as there is documented communication with the neurosurgery attending. The 30-minute timeframe starts from the time of request until the start of the neurosurgical evaluation. If the resident or APP is the primary assessor, the case should be discussed within the expected 30-minute time frame with the attending neurosurgeon. The attending neurosurgeon, if not physically present, is expected to review all relevant radiology studies within the 30-minute time frame to determine if emergent treatment is required.

*The Adult Neurosurgeon on-call provides back up as a contingency plan and the schedule is published in Perfect Serve. If the contingency plan is utilized, it will be reviewed and monitored by the trauma medical director at the Pediatric Trauma Executive Committee meeting.

Request for Orthopaedic response within 30 minutes of notification

Trauma patients with the following clinical scenarios require an assessment within 30 minutes of request:

- Hemodynamically unstable, secondary to pelvic fracture
- Suspected extremity compartment syndrome
- Fractures/dislocations with risk of avascular necrosis (e.g. femoral head or talus)
- Vascular compromise related to a fracture or dislocation
- Trauma surgeon discretion

*Orthopaedic evaluation may be done by an orthopaedic resident or APP. There must be documented communication with the attending orthopaedic physician. The time is measured from time of request until orthopaedic surgery representative at bedside.

Triage:

Triage decisions should be documented by attending physician making the decision. Over-triage, under-triage, response times, and other performance improvement measures will be reviewed according to the American College of Surgeons recommendations and the pediatric trauma program performance improvement plan.

HDVCH Pediatric Trauma Activation

Level 1 Pediatric Trauma Activation Criteria

- Intubated patients transferred from the scene OR transferred from outside facility with GCS ≤8 prior to intubation
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- Confirmed age-specific hypotension: Systolic blood pressure less than 70 mm Hg + (2 x age in years)
- Transfer patients from other hospitals receiving blood to maintain vital signs
- Glasgow Coma Score ≤8 with mechanism attributed to trauma
- Presence of paralysis or suspected spinal cord injury
- Penetrating injury to the head, neck, chest, abdomen
- Partial or complete amputation proximal to wrist or ankles
- Discretion of ED physician

YES

NO

Page Pediatric Trauma Level 1 Activation via the notification system

Assess for Level 2 Trauma criteria

Level 2 Pediatric Trauma Activation Criteria

Does not meet any Level 1 criteria, plus any of the below:

- Stable intubated patient transferred from outside facility with GCS ≥9 prior to intubation (HDVCH Trauma Attending and ED Attending must be in agreement of this plan)
- Two or more long bone fractures
- Injury to the limb requiring a tourniquet
- Pregnancy greater than 20 weeks (notify OB Charge (x352-9982) prior to arrival
- Ejection from enclosed vehicle
- Death of occupant in same vehicle
- Auto versus pedestrian/bike at >20 mph or run over
- Motorcycle/ATV/snowmobile crash at >20 mph
- Falls > 10 feet (or 3 x patient's height)
- Glasgow Coma Score 9-12 with mechanism attributed to trauma

Page Pediatric Trauma Level 2 Activation

If YES

If NO

Pediatric Trauma Consultation:

- Multi-system trauma injuries
- Known or suspected non-accidental trauma
- Non-isolated severe traumatic brain injury (eg. MVC, pedestrian, fall, etc)
- Injured patients requiring admission to a non-surgical service
- Blunt abdominal injury with firm or distended abdomen or with abdominal seatbelt sign
- Discretion of ED physician or designee

*Transfer patients should be directed to the ED

Trauma Code Team Roles

ED Attending
- Supervises Airway MD
- Assists with FAST exam
- If ACLS code, runs code

Primary RN
- Attach monitor devices
- Obtains vitals- reports vitals Q5-15 mins
- Ensures patency of current IV
- Hangs IVF and blood with 2nd RN

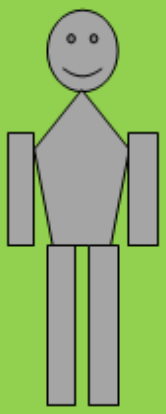
Second MD
- Primary Survey- calls out exam
- Fem Stick
- Secondary Survey- calls out exam
- Conduct AMPLE history
- Foley Placement

Trauma Surgeon
- Supervises Code
- Supports Trauma Leader
- Assists with assessment/plan
- Takes Team Leader role if involved in procedure
- Communicates emergent consults to attending MDs

Third MD
- Enter CPOE orders
- Delegate H&P
- Pulls up x-rays
- Ensures outside films are sent to radiology
- Notify consultants and OR

Airway / FAST MD
- Assess Airway
- Intubate / place OG/NG as needed
- Ensure C-spine precautions
- FAST exam after airway assessed & secure

PATIENT



Trauma Leader MD
- Lead time out
- Gives all orders
- Manages Code
- Delegates Procedures/Task
- Priorities (x-ray, FAST, CT, OR)
- Decides on consults and pt destination

RN Scribe (Secondary RN)
- Scribe clinical information
- Monitor I/O's
- MRN obtained /correct
- Report CT availability

Respiratory Therapist
- Assists with airway
- Set up suction
- Places O_2
- Sets up vent/$ETCO_2$

Second RN
- Pushes medications
- Places 2nd IV if needed
- Assists with MTP/Belmont
- Sets up Central /art line

Medical Student
- Remove Clothes
- Assist w femI stick / foley
- Take direction from team leader and Second MD

Support Team

Tech
- Pre check equipment
- Place pt ID band
- Exposure/Blankets/ Bair hugger
- Set up for procedure

Pharmacy
- Calculate / prepare RSI and other resuscitation meds

Charge Nurse
- Secure additional resources / communication
- Crowd Control- excuse unnecessary people

X-Ray
Lab
MSW/Chaplain/child life

References:

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2. US Department of Health and Human Services, Center for Disease Control and Prevention. Guidelines for the Field Triage of Injured Patients. Recommendations of the National Expert Panel on Field Triage, 2011. MMWR January 13, 2012: 61 (1).
3. Nwomeh BC, Georges AJ, Groner JI, et al. A leap in faith: The impact of removing the surgeon from the level II response. J Pediatric Surgery 2006; 41: 693-9.
4. Mukherjee K, Rimer M, McConnell MD, et al. Physiologically focused triage criteria improve utilization of pediatric surgeon-directed trauma teams and reduce costs. J Pediatric Surgery 2010; 45: 1315-23.
5. Falcone RA, Haas L, King E, et al. A multicenter prospective analysis of pediatric trauma activation criteria routinely used in addition to the six criteria of the American College of Surgeons.J Trauma Acute Care Surg 2012; 73: 377-84.
6. Fallon SC, Delemos D, Christopher D, et al. Trauma surgeon becomes consultant: Evaluation of a protocol for management of intermediate-level trauma patients. J Pediatric Surgery 2014; 49: 178-183.
7. Krieger AR, Wills HE, Green MC, et al. Efficacy of anatomic and physiologic