

Optimizing trauma activation criteria into a nursing driven tool for appropriate activation levels

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The challenge identified:

During review of December 2017 statistics at our ACS verified Level I Trauma Center, we noticed that our under-triage rate per the Cribari method was on the rise nearing 10 percent. The issue of undertriage has long been a priority due to the potential preventable mortality and morbidity associated with delays in activation of trauma teams and definitive care provided to trauma patients (American College of Surgeons, 2014). We congruently discovered several trauma patients that were not properly activated based on our internal activation criteria. The patients ultimately were reviewed via our PIPS process and it was identified that improper activation and lack of communication between pre-hospital, nursing staff and providers led to some of the improper levels of activation for these patients.

Objectives:

A tool was developed for nurses to use for proper activation based on pre-hospital information. The time-frame of implementation of this tool has a direct correlation with our under-triage rates decreasing. After initial implementation of the tool in January 2018, our under-triage rate decreased from 9.4% in December 2017 to 3.6 by August 2018.

Project Design:

An internal activation criteria tool was developed to mirror our activation criteria. This tool was included in the trauma flowsheet packets. Check boxes indicated the mechanism, vital signs, and other criteria that met our internal activation levels. The focus of the tool is for nurses receiving the notification of impending arrival of injured patient to ask clarifying questions and be able to appropriately activate based on the information obtained. The trauma nurses in the Emergency Department (ED) were instructed on the tool and recent patient scenarios of improper activation levels were discussed during the monthly trauma nurse meeting as well as at shift change. The purpose and importance of the tool was also described to the nurses who would predominantly be completing the tool. The Trauma Program Manager (TPM) also educated the charge nurses who would potentially be getting notification of injured patient arrival via pre-hospital communication.

Sustaining the change:

Sustaining the change was done by focusing on the use of the tool with every potential trauma activation. The tool was continually addressed during the first quarter of 2018 and periodically through the second quarter at both the monthly trauma nurse meetings as well as the monthly trauma team leader meetings. The completion of the tool was also included as part of the trauma nurses' monthly flowsheet audits performed by the PI nurses. The discrepancy of incorrect activation or omission of tool was directly communicated to the nurses as well as TPM and ED Director to ensure compliance of use. Implications of the findings suggest that familiarity of trauma activation criteria and empowerment of nurses that are directly involved in trauma care will improve under-triage rates of trauma activation. Although there have been two outlier months with higher under-triage percentages, the data show a gradual decreasing trend. Future steps would be to use the trauma tool to review activation criteria with the addition of other morbidity and mortality inducing risk factors (Jammula, et al., 2018) to ensure judicious use of our resources for our highest level of activation.

References:

American College of Surgeons, Committee on Trauma. (2014). Resources for Optimal Care of the Injured Patient. Available from <https://www.facs.org/-/media/files/quality%20programs/trauma/vrc%20resources/resources%20for%20optimal%20care.ashx>

Jammula, S., Bradburn, E. H., Gross, B. W., Cook, A. D., Reihart, M. J., Rogers, F. B. (2018). The magic number: Are improved outcomes observed at trauma centers with undertriage rates below 5%? Journal of Trauma and Acute Care Surgery, 85(4), 752-755. doi: 10.1097/TA.0000000000002002

TRAUMA RED
Specific injury with abnormal vital signs and level of consciousness: <ul style="list-style-type: none"> <input type="checkbox"/> GCS ≤ 10 <input type="checkbox"/> Shock <input type="checkbox"/> Systolic BP ≤ 90 mm Hg <ul style="list-style-type: none"> • Age ≤ 8 ≤ 80mm Hg • Age ≥ 60 ≤ 110mm Hg <hr/> <ul style="list-style-type: none"> <input type="checkbox"/> Respiratory rate <ul style="list-style-type: none"> • ≤ 10 or ≥ 29 or ≤ 20 in a ≤ 1 yr old <input type="checkbox"/> Unstable airway (i.e. intubated or emergent airway needed) <hr/> Assess injury: <ul style="list-style-type: none"> <input type="checkbox"/> All penetrating injuries to: <ul style="list-style-type: none"> Head, neck, torso, and extremities proximal to elbow and knee <input type="checkbox"/> Chest trauma/ flail chest/ crepitus <input type="checkbox"/> Motorcycle crash > 20mph <input type="checkbox"/> 2 or more proximal long bone fractures (i.e. humerus or femur) <input type="checkbox"/> Crushed, degloved, mangled or pulseless extremity <input type="checkbox"/> Amputation proximal to wrist and ankle <input type="checkbox"/> Pelvic fractures <input type="checkbox"/> Skull fracture: open or depressed <input type="checkbox"/> Paralysis <input type="checkbox"/> Hanging with neurological or respiratory concerns <input type="checkbox"/> Ejection (partial or complete) from the vehicle <input type="checkbox"/> Auto vs. pedestrian/bicyclist thrown, run over, or with significant impact >20mph <input type="checkbox"/> Falls <ul style="list-style-type: none"> • Adults: > 20 feet (1 story = 10 feet) • Children: > 10 feet or 2-3 times the height of the child <input type="checkbox"/> Unstable patients transferred from other hospitals (i.e. receiving blood products to maintain vitals) <input type="checkbox"/> Physician discretion <input type="checkbox"/> Pregnancy > 16 weeks with an injury listed above-activate as Trauma Red OB

TRAUMA ALERT
Specific injury with abnormal vital signs: <ul style="list-style-type: none"> <input type="checkbox"/> GCS 10-13 <input type="checkbox"/> HR ≥ 120 bpm <hr/> Falls: <ul style="list-style-type: none"> <input type="checkbox"/> Adults: 8-20 feet <input type="checkbox"/> 60yr ≥ 6-20 feet <input type="checkbox"/> Children: 6-10 feet (1 story = 10 feet) <hr/> High risk auto crash: <ul style="list-style-type: none"> <input type="checkbox"/> Intrusion site: > 12 inches, occupant site; > 18 inches, any site <input type="checkbox"/> Death in same passenger compartment <input type="checkbox"/> Rollover motor vehicle collision with injury <hr/> Sustained injury with: <ul style="list-style-type: none"> <input type="checkbox"/> Patients at risk for severe TBI & on blood thinners or receives hemodialysis. (ASA, plavix, coumadin, factor Xa inhibitors, direct thrombin inhibitors, etc.) <input type="checkbox"/> Burns with trauma mechanism and injury <input type="checkbox"/> Physician discretion <input type="checkbox"/> Pregnancy ≥ 16 weeks with an injury listed above-activate as Trauma Alert OB

TRAUMA CONSULT
Orthopedic injury: <ul style="list-style-type: none"> <input type="checkbox"/> Requiring admission involving multiple extremities or pelvic fractures <hr/> Patients requiring admission: <ul style="list-style-type: none"> <input type="checkbox"/> Facial traumatic injuries <input type="checkbox"/> Neurological injuries <input type="checkbox"/> Abdominal seatbelt sign <input type="checkbox"/> Multiple rib fractures <hr/> Time-Sensitive: <ul style="list-style-type: none"> <input type="checkbox"/> Extremity injury (i.e. compartment syndrome)

ADDITIONAL INFORMATION CONCERNING TRAUMA ACTIVATION

- If EMS notifies us of a 'Level 1' or 'immediate' patient then we will activate either a trauma 'Red' or 'Alert' based on our internal trauma activation criteria. Feel free to specifically ask EMS if they consider this pt to be a 'level 1' or 'immediate'.
- The nurse/ medic answering the patch phone may ask additional questions to help determine our internal activation level, but should remain mindful that the time the paramedic spends on the phone may be limited due to the needs of the patient. Time on the phone takes away from patient care.
- In addition, if EMS does not consider an incoming pt as a 'level 1' or 'immediate', but based on our internal activation criteria, this pt will require a trauma activation, please advise the crew. Simply state that this pt meets our internal activation criteria and that the trauma team will be activated. This will help prevent those surprises when they arrive here and are confused about meeting the trauma team.
- Lastly, please activate all injury/trauma patients arriving via air i.e. rotary or fixed wing.

Trauma Activation Tool	
<p style="text-align: center;">Trauma RED activation (Mark your Rationale)</p> <p>Specific injury with abnormal vitals/LOC</p> <ul style="list-style-type: none"> <input type="checkbox"/> Airway or Respiratory Compromise <ul style="list-style-type: none"> <input type="checkbox"/> Intubated PTA or in trauma Bay <input type="checkbox"/> ≤ 10RR, ≥ 29RR <input type="checkbox"/> GCS ≤ 10 with trauma <input type="checkbox"/> Low Systolic BP with trauma <ul style="list-style-type: none"> <input type="checkbox"/> Confirmed ≤ 90mmHg <input type="checkbox"/> Age ≥ 60 & < 110mmHg <input type="checkbox"/> Shock with Hx of trauma <input type="checkbox"/> Transferred pts receiving blood products to maintain vitals <p>Assessment of Injuries</p> <ul style="list-style-type: none"> <input type="checkbox"/> Penetrating Injury <ul style="list-style-type: none"> <input type="checkbox"/> Head, Neck, Chest, Torso (Abd/Pelvis) <input type="checkbox"/> Extremities above elbow or above knee <input type="checkbox"/> Chest <ul style="list-style-type: none"> <input type="checkbox"/> Flail Chest or Crepitus in Chest <input type="checkbox"/> Neuro <ul style="list-style-type: none"> <input type="checkbox"/> Open or Depressed skull deformity <input type="checkbox"/> Paralysis <input type="checkbox"/> Hanging <input type="checkbox"/> Ortho <ul style="list-style-type: none"> <input type="checkbox"/> Pelvic FX - instability <input type="checkbox"/> ≥ 2 long bone FXs- Humerus, Femur, Etc <input type="checkbox"/> Crushed, degloved, mangled or pulseless extremity <input type="checkbox"/> Amputation above wrist or above ankle <input type="checkbox"/> MVC - MCC <ul style="list-style-type: none"> <input type="checkbox"/> Auto vs. pedestrian/bicyclist thrown, run over, or with significant impact >20mph <input type="checkbox"/> Ejection (partial or complete) from the vehicle <input type="checkbox"/> Motorcycle crash >20mph <input type="checkbox"/> Major Burns <ul style="list-style-type: none"> <input type="checkbox"/> % TBSA & Injury <input type="checkbox"/> Falls <ul style="list-style-type: none"> <input type="checkbox"/> Adults >20ft <input type="checkbox"/> Pediatrics >10ft or 2-3 times the child's height (Reference: 1 story = 10ft) <input type="checkbox"/> OB <ul style="list-style-type: none"> <input type="checkbox"/> Pregnancy > 16 weeks with an injury listed in RED criteria - activate as "Trauma Red OB" <input type="checkbox"/> Physician discretion (Name: _____) 	<p style="text-align: center;">Trauma ALERT activation (Mark your Rationale)</p> <p>Specific injury with abnormal vital signs/LOC</p> <ul style="list-style-type: none"> <input type="checkbox"/> GCS 10-13 with Hx of trauma <input type="checkbox"/> HR ≥ 120 bpm <p>Mechanism</p> <ul style="list-style-type: none"> <input type="checkbox"/> High Risk MVC <ul style="list-style-type: none"> <input type="checkbox"/> Intrusion: >12 inches - occupant site OR >18 inches - any site <input type="checkbox"/> Death in same passenger compartment <input type="checkbox"/> Rollover motor vehicle collision with injury <input type="checkbox"/> Falls <ul style="list-style-type: none"> <input type="checkbox"/> Adults: 8 ft - 20 ft <input type="checkbox"/> 60yr ≥ 6 ft - 20 ft <input type="checkbox"/> Children: 6-10 ft <p>(Reference: 1 story = 10 feet)</p> <p>Sustained injury with</p> <ul style="list-style-type: none"> <input type="checkbox"/> Burns <ul style="list-style-type: none"> <input type="checkbox"/> TBSA % & trauma / injury mechanism <input type="checkbox"/> Patients at risk for severe TBI & on blood thinners or receives hemodialysis Consider Age > 65 with LOC & use of ... ASA, Plavix, Coumadin, factor Xa inhibitors, direct thrombin inhibitors, etc. <input type="checkbox"/> OB <ul style="list-style-type: none"> <input type="checkbox"/> Pregnancy ≥ 16 weeks with an injury listed in Alert Criteria - activate as "Trauma Alert OB" <input type="checkbox"/> EMS Judgement <ul style="list-style-type: none"> <input type="checkbox"/> Called as an Immediate/Trauma but doesn't meet our criteria <input type="checkbox"/> Physician discretion (Name: _____) <hr/> <p>Consider:</p> <ul style="list-style-type: none"> -MVC/MCC- Rate of speed, Death on scene, intrusion -GSW - Caliber, Gun type (handgun, shotgun, rifle) -Did the patient lose consciousness? -Upgrade to Red: Intubation, Blood products <p>-Activate all helicopter/flight patients unless otherwise directed by the Trauma Surgeon. Name of Surgeon <i>not</i> activating.</p> <p>Print your Name & Title: _____</p>

