Appendix C: Facilitator Cheat Sheet & Debriefing Tips

Debrief Tips:

- The medical focus of this debrief is intra-abdominal and severe intracranial injuries. Below are possible discussion points for the junior or senior level regarding the pediatric polytrauma patient.

Start by asking one of the learners to summarize the case and describe what they thought was the patient's main issue.

Medical Aspects

Common Pediatric Trauma issues:

- Broselow Tape and weight-based dosing - *Ask learner how they decided on doses*
- IV access – how to obtain intraosseus access? *If learner had delayed vascular access, bring up how you can cognitively off-load the task up front giving clear criteria to the team "If we fail at 2 attempts, I'd like to proceed with IO at that point, please let me know if that's the case"* Video reference

Basics of Primary and Secondary survey in trauma

- *Explore the learner's frame when it comes to fluid resuscitation. Ask questions such as, "I noticed you decided to give crystalloid, can you tell me what your thought process was at that time".* Compensatory tachycardia with preserved BP indicating early hypovolemic shock in trauma scenarios. Also consider that this is a head injury and we might actually expect that this BP is representative of an early Cushing response. Blood (10-20mL/kg) preferable to crystalloid (20-40mL/kg) when you have trauma with tachycardia and signs of poor perfusion. Consider pain management.
- *State your observation that there were multiple competing priorities and ask the team why they addressed things like temperature and glucose (if they did).* Hopefully the learner's did so because of unique pediatric physiology with large body surface area leading to hypothermia and increased metabolic rates leading to earlier hypoglycemia
- Pediatric GCS vs. AVPU scores. The GCS is a useful tool but can be complicated to remember. A good way to decrease cognitive load is using the AVPU score.
- C-spine precautions – c-spine injuries tend to be higher in children due to large occiput and flexible ligaments.

Pediatric airway management – *Ask learner about airway management choice, "I noticed you had a robust airway plan up front. Pediatric patients are both easier and more difficult to intubate, can the team tell me what they were all thinking when planning for intubation". Hopefully they will address pediatric airway differences including:*

- Anatomical differences: Large occiput alters the position, large tongue and adenoid tissue, floppy epiglottis with anterior larynx, short trachea, narrow cricoid. Assure that pre-intubation positioning is appropriate to straighten the larynx and use a straight blade. Avoid pushing tube too distal as this can lead to right mainstem intubation.
- Percutaneous needle cricothyrotomy: The pediatric larynx is small and difficult to stabilize. Surgical cricothyroidotomy is contraindicated <8 years but may be performed in older children in which the membrane is palpable (10-12 years old). Needle cricothyrotomy should be considered as a rescue airway. Video reference

Traumatic head injury (severe) – *If the team noticed the Cushing response late, ask, " I noticed it took a while to recognize a Cushing response. When we have complex traumas, it can be hard to realize that there is a second injury causing changing physiology. I would like to explore if there was anyone on the team who may have been worried about this earlier, and it not, if there are any tools that we could use in the future to help recognize things like this sooner? "*

- Signs of intracranial hypertension / herniation?
  1) Cushing Reflex - triad of bradycardia, hypertension, irregular respirations.
  2) Ipsilateral pupil dilation + contralateral hemiparesis (uncal herniation)

- Treatment for elevated ICP / signs of herniation?

1) Head of bed at 30 degrees
2) Treat pain and anxiety
3) Treat seizures (phenytoin or levetiracetam for prevention; benzodiazepine as a fast-acting option)
4) Hypertonic saline 3% 3-4ml/kg boluses. Mannitol is also an option.
5) Normocapnia + hyperventilate (decrease PaCO2 to induce cerebral vasoconstriction) to target of pupillary constriction

- What Physiologic parameters should be monitored to protect the brain from secondary injury in severe head injury?
  1) Maintain euvolemia and normal systolic blood pressure
  2) Maintain normal oxygen saturation >90% and PACO2 35-40mmHG (unless signs of herniation)
  3) Prevent hypothermia with warmed fluids, blankets and overhead warmer.
  4) Euglycemia

Intrabdominal injury

- Interpretation of eFAST - *Ask the learner how they interpreted the FAST and how it affected their management? Did this affect the team's decision for volume expansion?*
  1) **Pediatric FAST has relatively low sensitivity**. Requires repeat assessment and resuscitation if abnormal vitals.
  2) In contrast to adults, few intra-abdominal injuries warrant surgical intervention. Liver, splenic, and kidney injuries are generally self-limited. Focus should be placed on the hemodynamic assessment.
  3) Algorithm with regards to abdominal imaging:
     - Positive FAST with a stable patient -> CT scan
     - Positive FAST and decompensated shock -> straight to OR ; if resuscitation leads to stabilization-> CT
     - Negative FAST with normal LFT's and low suspicion -> serial examination; high clinical suspicion and elevated LFT's -> CT

TXA in pediatrics? *Ask learner if they thought about using TXA*

- Not standard of care in pediatric polytrauma
- PED-TRAX – Military observational study of 766 pediatric patients suggesting an association with decreased mortality.
- No other study addressing TXA use in pediatrics, however some extrapolate CRASH-2 to adolescents within a 3-hour window.

Communication and crisis resource management

- Family Management – *Having family members in the room can be very stressful, what are some tools that we can employ to deal with this additional stressor?*
  Family presence may reduce stress on families and the patient without compromising team dynamics or medical care. However, in a situation where family members are disruptive, it is important to delegate a team member to care for the family to avoid distraction from patient care.
- *One really important CRM tool is that of setting dynamic priorities and this was especially true in this case. You can ask things like "I noticed there was a lot of information being fed back to the leader as things quickly evolved, what are some things that we can do as a team to make sure we are all on the same page and all in agreement of what the most pressing priority is"*
- Team dynamics – *Comment on closed loop communication, division of roles.*
- Discussion with receiving team and transport – *Comment on communication with consulting team.*
  If team opted to do scans prior to transferring – discuss that emphasis should be to move patient to definitive management (i.e. away from community center and to a tertiary care trauma center).

