ECHO Summary,13/February/2026 Session Title: Managing the Trapped Accident Victim: Best Practices in Emergency Medicine

Summary Author: Maulik Lathiya, MBBS

Edited by: Amy Bridges, MD

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The information presented in this summary is based on the presentation given by the panelists and is intended for general informational purposes only. The authors and collaborating partners do not accept responsibility for any outcomes resulting from the implementation of treatments outlined in this document. It is strongly recommended that individuals verify the information against their national guidelines and seek professional advice before making any decisions related to the content presented herein.

Areas Covered

- Comprehensive management of a trapped RTA (Road Traffic Accident) victim (polytrauma + crush injury)
- Scene approach: hazard identification, safety, team coordination
- Prehospital priorities: ITLS approach, rapid assessment, stabilization
- Extrication principles: controlled release, patient-centered removal
- Emergency department care: ABCDE resuscitation and reassessment
- Nursing care planning: prioritized interventions with rationale
- Pathophysiology, recognition, and management of crush syndrome (traumatic rhabdomyolysis)
- Complication prevention: AKI, hyperkalemia, compartment syndrome
- Transport, referral systems, and multidisciplinary care

ECHO Session Panelists:

Experts: Dr. Tracy – Emergency physician, prehospital and retrieval specialist
Johannes (Dr. Mona reference) – Extrication specialist (Germany)

Patient Case Presenters: Dr. Emmanuel – Emergency medicine resident

Moderator: Akatunda Precious – Critical Care Unit, Nsambya Hospital

Epidemiology

- RTAs are a leading cause of trauma morbidity and mortality
- Approx. 10 deaths/day from road traffic accidents
- High burden in low-resource settings due to:
    - Poor road infrastructure
    - Limited EMS systems
- Majority of trauma cases seen in emergency departments are RTA-related
- Polytrauma cases frequently involve:
    - Head injury
    - Chest injury
    - Limb crush injuries
- High incidence of preventable deaths due to delayed care

Risk Factors

- High-speed collisions (e.g., lorries, heavy vehicles)
- Prolonged entrapment (>30–60 min) → ↑ risk of crush syndrome
- Lack of pre-hospital emergency response systems
- Inadequate scene coordination (police, EMS, fire)
- Unsafe driving behaviors (overloading, speeding, poor signage compliance)
- Poor vehicle safety standards
- Delayed extrication due to lack of equipment
- Severe mechanism of injury (MOI):
    - Dashboard compression
    - Limb entrapment
    - Vehicle overturning
- Inadequate training of first responders/community rescuers

Clinical features

AIRWAY:

- Blood pooling in oral cavity → **aspiration risk**
- Gurgling sounds → **partial airway obstruction**
- Reduced GCS → loss of airway reflexes such as gag
- Facial trauma may worsen obstruction

- Risk of **airway compromise during extrication**

BREATHING:

- Tachypnea (RR ↑) due to hypoxia/acidosis
- Labored, shallow breathing → **fatigue and impending failure**
- Reduced air entry → **pneumothorax/hemothorax**
- Possible tension pneumothorax (which obstructs cardiac refill from intrathoracic trauma) → **life-threatening**
- Oxygen saturation may initially improve with oxygen -improvement does not eliminate risk for serious issue

CIRCULATION:

- External bleeding (scalp laceration) → may appear minor but significant
- Internal bleeding suspected (chest, pelvis, abdomen)
- Hypotension → **shock (likely hemorrhagic)**
- Tachycardia (compensatory)
- Weak, thready pulse
- Delayed capillary refill → **poor perfusion**
- Cold extremities → peripheral vasoconstriction
- Risk of **crush-related hypovolemia after release**

DISABILITY:

- GCS 7 → severe traumatic brain injury
- Reduced responsiveness
- Possible hypoxia, shock, or brain injury cause
- Pupils may be normal initially - unequal pupils are often a late sign
- Risk of deterioration

EXPOSURE:

- Multiple injuries (polytrauma)
- Limb crush injury → swelling, blisters, discoloration
- Hypothermia risk due to:
    - Blood loss
    - Environmental exposure
- Hidden injuries (pelvic, spinal)
- Skin integrity compromised → infection risk

Diagnostics

Primary (Immediate):

- ABCDE assessment (clinical diagnosis)
- Vital signs monitoring
- Pulse oximetry
- GCS assessment
- ECG monitoring (for hyperkalemia)

Secondary (Hospital):

- Imaging:
    - CT scan (polytrauma)
    - Chest X-ray
    - Pelvic X-ray
- FAST ultrasound → detect internal bleeding

Laboratory Investigations:

- Electrolytes → especially **potassium (hyperkalemia)**
- Renal function tests → detect AKI
- Creatine kinase (CK) → marker of muscle breakdown
- Blood gases → metabolic acidosis
- Full blood count → anemia
- Urinalysis:
    - Myoglobinuria (tea-colored urine)

Monitoring:

- Urine output (target ≥300 ml/hr in crush injury)
- Continuous ECG for arrhythmias
- Serial labs for progression

Treatment

1. **Scene Management**

- Ensure **scene safety (primary priority)**
- Identify hazards:
    - Fire risk
    - Fuel leaks
    - Unstable vehicle
    - Risk from continuing traffic

- Use PPE (gloves, goggles, protective clothing)
- Call for backup (fire brigade, police)
- Assign roles + team leader

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2. Primary Survey (ABCDE)

Airway:

- Suction blood/secretions
- Jaw thrust (avoid neck movement)
- Insert airway adjunct (OPA/NPA)

Breathing:

- High-flow oxygen (15 L/min)
- Needle decompression for suspected tension pneumothorax

Circulation:

- Control bleeding (direct pressure, bandaging)
- Insert **2 large-bore IV lines**
- Fluid resuscitation
- Consider blood transfusion

Disability:

- GCS monitoring
- Prevent secondary brain injury

Exposure:

- Full body exam
- Prevent hypothermia (cover patient)

3. Extrication

- Stabilize vehicle before access
- Use proper tools (avoid unsafe improvisation)
- Controlled, coordinated extrication
- Avoid sudden release of compressive force
- Patient-centered (self-extrication if possible)

4. Crush Syndrome Management

Pathophysiology:

- Muscle breakdown → myoglobin + potassium release
- Leads to:
    - Hyperkalemia → arrhythmias
    - AKI → renal failure
    - Metabolic acidosis

Management:

- Early **aggressive IV fluids** (before and after release)
- Monitor ECG for hyperkalemia
- Treat hyperkalemia:
    - Calcium gluconate → stabilizes heart
    - Insulin + glucose → shifts potassium
    - Salbutamol → intracellular shift
- Avoid routine tourniquet use (unless severe bleeding)
- Prepare for **sudden deterioration after release**

5. Emergency Department Care

- Repeat ABCDE
- Continue fluids (large volumes)
- Maintain urine output ≥300 ml/hr
- Insert chest tube if needed
- Immobilize fractures
- Pain control (analgesia titration)
- Monitor labs closely

6. Nursing Management

- Continuous reassessment
- Monitor vitals and perfusion
- Maintain warmth
- Wound care (aseptic technique)
- Pain management
- Psychological support
- Fluid balance monitoring

7. Transport & Handover

- Rapid transport (“load and go”)
- Pre-alert receiving hospital
- ISBAR handover:

- Identify
- Situation
- Background
- Assessment
- Recommendation

Complications

Immediate:

- Airway obstruction
- Tension pneumothorax
- Hemorrhagic shock
- Cardiac arrest

Early:

- Crush syndrome
- Hyperkalemia → fatal arrhythmias
- Acute kidney injury

Late:

- Compartment syndrome
- Sepsis
- Multi-organ failure
- ARDS

Long-term:

- Limb loss (amputation)
- Chronic kidney disease
- Disability

Disposition

- Admit to emergency/trauma unit
- Multidisciplinary management:
  - Orthopedics → fractures, fasciotomy
  - Surgery → internal injuries
  - Nephrology → dialysis
  - ICU → critical care
- Continuous monitoring (vitals, labs, urine output)
- Dialysis if:

    - Refractory hyperkalemia
    - Severe AKI
- Rehabilitation planning

Special Notes

- Scene safety ALWAYS comes first
- Do not rush extrication without stabilization
- Early fluids are lifesaving in crush injury
- Hyperkalemia is the **most immediate lethal complication**
- Reassess continuously (ABCDE cycle)
- Communication and leadership are critical
- Use proper equipment and trained personnel
- Hypothermia worsens bleeding and outcomes
- High mortality if poorly managed (20–50%)
- Documentation and proper handover improve outcomes

Collaborating Partners

1. Ministry of Health of the Republic of Uganda
2. Seed Global Health
3. Techies Without Borders

References

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Please email Dr. Amy Bridges with comments or questions at bridgesa@umsystem.edu, or message via WhatsApp at +1 234 380 3635.

TABLE 38-2

Glasgow Coma Scale

BEHAVIOR	RESPONSE	SCORE
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score:	*Best response*	15
	Comatose client	8 or less
	Totally unresponsive	3