



Trauma — Primary & Secondary Survey

Find and fix what kills first · Then look everywhere else

TXA WITHIN 3 h
later may harm

PRIMARY SURVEY *treat each problem as you find it, before moving on*

Step	Look for	Do now
<C>	Catastrophic external hemorrhage	Direct pressure, tourniquet, hemostatic dressing. Exsanguinating limb bleeding is addressed before the airway.
A	Airway obstruction, with cervical spine protection	Open the airway, suction, adjuncts, definitive airway if compromised. Manual in-line stabilization throughout.
B	Tension pneumothorax, open pneumothorax, massive hemothorax, flail chest	Tension is a clinical diagnosis — decompress immediately, then chest drain. Do not wait for a film.
C	Hemorrhagic shock, cardiac tamponade	Two large-bore cannulae, blood not crystalloid , control bleeding. Chest, abdomen, pelvis, retroperitoneum and long bones are the five places blood hides.
D	GCS, pupils, lateralising signs , glucose	Check a glucose in every altered trauma patient. A falling GCS demands CT and neurosurgical discussion.
E	Full exposure, then prevent hypothermia	Log-roll, inspect the back , then cover and actively warm. Hypothermia worsens coagulopathy and is easy to cause during resuscitation.

DAMAGE CONTROL RESUSCITATION *the modern approach to the bleeding patient*

- 1 Stop the bleeding — nothing else works until you do.** Pressure, tourniquet, pelvic binder, and early transfer to the OR or interventional radiology. **Resuscitation is a bridge to hemostasis, not a substitute.**
- 2 Give blood products, not crystalloid.** Large-volume crystalloid dilutes clotting factors, worsens acidosis and hypothermia, and increases bleeding. **Minimize crystalloid entirely.**
- 3 Balanced ratio transfusion** — roughly 1:1:1 red cells, plasma and platelets. Note the evidence honestly: in **PROPPR**, the **primary endpoints of 24-hour and 30-day mortality were not significantly different** between 1:1:1 and 1:1:2; the benefit in **death from exsanguination at 24 hours and achievement of hemostasis was a secondary finding**, and it is what drove practice change.
- 4 Tranexamic acid within 3 hours of injury — 1 g over 10 minutes, then 1 g over 8 hours.** **CRASH-2** showed a mortality benefit given early, and **harm when given after 3 hours.** **CRASH-3** supports early TXA in mild-to-moderate traumatic brain injury. **The time window is the whole point.**
- 5 Correct the lethal triad: hypothermia, acidosis and coagulopathy** reinforce one another. Warm the patient and the fluids, give calcium (citrate in stored blood chelates it), and use viscoelastic testing where available.

SECONDARY SURVEY *only once the primary survey is complete and the patient is stable*

HEAD-TO-TOE, FRONT AND BACK

A complete examination including scalp, face, **tympanic membranes**, neck, chest, abdomen, pelvis, perineum, **rectal and genital examination** where indicated, all four limbs, and the back on log-roll. **Take an AMPLE history:** Allergies, Medications, Past history, Last meal, Events and environment.

THE INJURIES MISSED HERE

Posterior and axillary wounds, compartment syndrome (pain on passive stretch — a normal pulse does not exclude it), **cervical and thoracolumbar spine** injury, hollow viscus perforation, **ocular injury**, and digit or hand injuries. **Re-examine repeatedly** — a formal tertiary survey within 24 hours exists precisely because injuries are missed on day one.

DECISIONS THAT CANNOT WAIT *where imaging is the wrong next step*

Scenario	Action
Unstable with a positive FAST	Straight to the OR. Do not send an exsanguinating patient to the CT scanner — the corridor is where they arrest.
Suspected pelvic fracture with shock	Apply a pelvic binder at the greater trochanters immediately. Avoid repeated "springing" of the pelvis, which disrupts clot.
Tension pneumothorax	Decompress on clinical grounds. Imaging first is a recognized cause of preventable death.
Traumatic cardiac arrest	Address the reversible causes in parallel — hypovolemia, tension pneumothorax, tamponade, hypoxia. Chest compressions are a low priority compared with hemorrhage control and decompression in this setting.
Head injury on anticoagulation	Urgent CT and immediate reversal. A lucid patient on a DOAC or warfarin can deteriorate rapidly, and delay to reversal drives outcome.

ADJUNCTS TO THE PRIMARY SURVEY *done alongside, not afterwards*

MONITORING & TUBES

Continuous ECG, oximetry, blood pressure, capnography · **urinary catheter** — but **not before excluding urethral injury** (blood at the meatus, scrotal hematoma, high-riding prostate) · **gastric tube**, using the oral route if there is a suspected base-of-skull fracture · **arterial blood gas with lactate and base deficit**, which quantify the shock better than blood pressure.

IMAGING & LABS

Chest and pelvic X-ray and **FAST** in the resuscitation room. **Whole-body CT** once stable enough to travel. Send **group and crossmatch, complete blood count, coagulation, and a pregnancy test** in every woman of childbearing age. Activate the **major hemorrhage protocol early** — it is easier to stand down than to catch up.

PEARLS & PITFALLS

- TXA is time-critical.** Within 3 hours it saves lives; after 3 hours it may cause harm. Document the time of injury, not just the time of arrival.
- Blood, not crystalloid.** Large-volume clear fluid worsens the coagulopathy you are trying to treat.
- Do not take an unstable patient to CT.** Positive FAST plus instability means the OR.
- Keep them warm.** Hypothermia is iatrogenic in most trauma resuscitations and directly worsens bleeding.
- A palpable pulse does not exclude compartment syndrome** — pain on passive stretch is the early sign.
- Do a tertiary survey.** Missed injuries are common and are found by re-examining, not by re-reading the first CT.

