Trauma: Primary and Secondary Survey

xABCDE priorities, hemorrhage control, shock classes, damage control resuscitation and chest injuries for trauma exams

PRIMARY SURVEY: XABCDE

ATLS 11 (xABCDE, 2025) and PHTLS (XABCDE) stop exsanguinating bleeding before the airway; TNCC 9th edition switches to C-ABC for uncontrolled bleeding.

STEP	LOOK FOR	DO
x	Spurting or pooling blood	Pressure, tourniquet, hemostatic packing
A	Obstruction, face or neck injury, burns	Open and protect; limit spine motion if blunt
B	Distress, unequal breath sounds, low SpO2	Oxygen; decompress tension; seal open wounds
C	Shock; chest, abdomen, pelvis, femur bleeding	IV or IO, blood, pelvic binder, eFAST
D	GCS, pupils, lateralizing signs, glucose	Prevent hypoxia and hypotension
E	Hidden wounds, temperature	Expose fully, then warm

EXAM TIP Exams: bleeding control comes first, and blood comes before intubating a hypotensive patient; post-intubation hypotension is linked to worse survival.

HEMORRHAGE CONTROL

- Tourniquet on skin 2–3 inches above the wound; "high and tight" if the source is unclear
- Tighten until bleeding stops and the distal pulse is gone; add a second beside it if needed
- Mark the time; don't loosen it to "check" the wound
- Junctional wounds: junctional tourniquet if one fits, or pack hemostatic gauze and press 3+ minutes
- Suspected pelvic fracture: binder or sheet centered on the greater trochanters; too high is the common error

SAFETY After 6 hours, a tourniquet comes off only with close monitoring and labs available.

HEMORRHAGIC SHOCK CLASSES

Base deficit worsens by class (about –2, –6, –10 mEq/L). Class III needs blood; class IV, massive transfusion.

CLASS	LOSS (70-KG ADULT)	WHAT YOU SEE
I	<15% (<750 mL)	Near-normal vital signs
II	15–30% (750–1,500 mL)	HR normal or up, narrow pulse pressure, BP normal
III	31–40% (1,500–2,000 mL)	HR up, BP may fall, confused, low urine output
IV	>40% (>2,000 mL)	HR high, hypotension, lethargy, little urine

EXAM TIP Hypotension first appears in class III. Age, beta-blockers and pacemakers blunt tachycardia, so add shock index (HR ÷ SBP; worry near 1), lactate and base deficit.

DAMAGE CONTROL RESUSCITATION

- Permissive hypotension until bleeding stops: SBP 80–90 (MAP 50–60) mm Hg
- Not for TBI (SBP 110+; MAP 80+ if GCS 8 or less) or spinal injury; caution if older or hypertensive
- Little crystalloid; early whole blood, or plasma, platelets and RBCs near 1:1:1
- MTP trigger, ABC score 2+: penetrating torso injury, SBP <90, HR >120, positive FAST
- TXA within 3 hours for hemorrhagic shock (often SBP <90 or HR >110): 1 g IV over 10 min, then 1 g over 8 h; EMS may give 2 g once
- Calcium: citrate in blood binds it; TCCC gives 1 g after the first unit; keep iCa 1.1–1.3 mmol/L
- Triad of death: hypothermia (<35 °C), acidosis, coagulopathy; low iCa makes the "lethal diamond"; cold crystalloid worsens all

SAFETY Never start TXA more than 3 hours after injury: in CRASH-2, late doses raised deaths from bleeding. Doses are typical adult ranges for exam study; follow your institution's or agency's protocols.

CHEST INJURIES THAT KILL FAST

Adult needle sites: 4th–5th space just anterior to the midaxillary line, or 2nd midclavicular (not medial to the nipple); about 8 cm. Decompression follows protocol; nurses recognize, prepare and assist.

INJURY	KEY SIGNS	INTERVENTION
Tension pneumothorax	Absent breath sounds, hyperresonant; late: low BP, JVD, tracheal shift	Needle decompression, then finger or tube thoracostomy
Massive hemothorax	Shock, decreased breath sounds, dull, neck veins usually flat	Blood, chest tube; surgery if >1,500 mL initially or >200 mL/h for 2–4 h
Open pneumothorax	Sucking or bubbling wound	Vented seal (else non-vented or 3-sided); chest tube; watch for tension
Flail chest	2+ (some say 3+) adjacent ribs broken in 2+ places; paradoxical motion	Oxygen, analgesia, ventilation if failing; watch the contusion
Traumatic asphyxia	Chest crush: purple face and neck, petechiae, bloodshot eyes	A marker of chest crush: oxygen; look for contusion, flail, pneumothorax
Cardiac tamponade	Beck triad, pulsus paradoxus >10 mm Hg, PEA; positive FAST	Volume, pericardiocentesis to buy time, surgery

EXAM TIP Tension pneumothorax is a clinical diagnosis: decompress before the x-ray. Neck veins may be flat if the patient is also bleeding. Burp a chest seal if distress worsens.

SECONDARY SURVEY, HEAD AND SPINE

- Begins after the primary survey and initial resuscitation; any decline sends you back to xABC
- AMPLE: allergies, medications (anticoagulants, beta-blockers), past illness or pregnancy, last meal, events
- Head-to-toe exam, log roll to inspect the back, then CT
- TNCC: F–G close the primary survey (full vitals/family presence, adjuncts/comfort); H–I are the secondary (history/head-to-toe, inspect the back); J: keep reevaluating
- TBI: SpO2 above 90%, EtCO2 35–45; hyperventilate to EtCO2 30–35 only for herniation signs
- Spinal motion restriction after blunt trauma with altered mentation, midline tenderness, focal deficit, deformity, intoxication or distracting injury; not for isolated penetrating trauma

Sources (29) are listed with links at icubasics.com/sheets/trauma-primary-survey.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.