EMT: Soft-Tissue and Musculoskeletal Trauma

Bleeding control, impaled objects, eviscerations, amputations, splinting, traction splints, pelvic binders, crush and mechanism of injury

BLEEDING CONTROL, IN ORDER

STEP	HOW
1. Pressure	Expose the wound, press hard directly on it, then a pressure dressing
2. Tourniquet (limb)	Commercial device on bare skin 2–3 in above the wound, not over a joint; tighten until bleeding stops and the distal pulse is gone
Still bleeding	Second tourniquet just above the first; on the thigh, two side by side
3. Packing	Groin or axilla, or bleeding that continues despite pressure or a tourniquet: pack gauze tightly to the depth of the wound, then hold pressure
After	Write the time on the patient and the report; leave it uncovered; reassess at every move

SAFETY Never loosen a tourniquet to relieve pain or to check the wound, and never remove packing to look. Survival is better when the tourniquet goes on before shock.

IMPALED OBJECTS, EVISCERATIONS, CHEST AND EYE WOUNDS

INJURY	DO	NEVER
Impaled object	Stabilize in place with bulky dressings; pressure around it	Remove, push in or cut flush (exceptions: cheek object blocking the airway, object preventing CPR)
Evisceration	Saline-moistened sterile dressing, occlusive layer over it, keep warm, nothing by mouth	Push organs back; dry dressing
Open chest wound	Vented or semi-occlusive seal; burp it if breathing worsens	Ignore rising distress: think tension
Penetrating eye	Stabilize the object, rigid shield without pressure, cover the other eye	Remove the object or press on the globe
Orbital blowout	Double vision looking up, numb cheek and upper lip, sunken eye (Merck): shield the eye, ice to the cheek	Blowing the nose; pressure on the globe

Tension pneumothorax and the other chest killers: see Trauma: Primary and Secondary Survey.

AVULSIONS, AMPUTATIONS AND THE FACE

- Skin flap or degloving: lay the tissue back in place, moist sterile dressing, pressure
- Stump: pressure or tourniquet; partial amputation is splinted in position, never completed
- Amputated part: dry sterile gauze, plastic bag, that bag on ice in a second bag; tissue never touches ice; goes with the patient
- Tooth: hold by the crown, rinse 10 seconds if dirty, carry in milk or saline
- Nosebleed: sit up, lean forward, pinch the soft nose 10–15 minutes without letting go
- Unstable jaw: cannot swallow; transport sitting up with suction if no spinal-care criteria
- Pinpoint wound from a paint or grease gun: surgical emergency despite mild pain
- Nail through a shoe: deep foot infection, Pseudomonas included; hospital for cleaning, tetanus and antibiotics (Pennycook 1994)
- Knuckle cut from a punch: a human bite into tendon or joint (Merck); cover, splint, hospital

SPLINTING RULES

- Life threats first; in an unstable patient, splint on the stretcher or en route
- Check distal pulse, motor and sensation before and after every splint and move; document both
- Fracture: immobilize the joints above and below. Joint injury: immobilize the bones above and below
- Splint as found. If distal circulation is lost, one gentle attempt to restore alignment, then recheck
- Pad, secure without constricting, remove rings and watches before swelling
- Pulse lost after splinting: loosen and readjust, recheck, transport promptly
- Cool packs (never ice on bare skin); elevate if no compartment signs

EXAM TIP Exams: painful, swollen, deformed limb with no way to tell sprain from fracture is splinted as a fracture.

OPEN FRACTURES AND DISLOCATIONS

INJURY	CLUE	EMT CARE
Open fracture	Bone end or wound over the fracture	Pressure around the bone, saline-moistened sterile dressing, splint as found; never push bone back
Anterior shoulder	At least 95% of dislocations; arm held out from the side	Sling and swathe as found; check deltoid sensation and radial pulse
Posterior hip	Knee hit the dash; leg short, adducted, internally rotated	Pillows as found; check distal function; urgent transport
Knee	Deformity reported, now looks normal	Treat as a reduced dislocation: compare both feet, recheck often
Posterior shoulder	After a seizure or electric shock; arm locked adducted and internally rotated; may look normal	Sling as found; often missed, so report it (Merck)
Child: wrist or elbow	Swelling or tenderness without deformity: growth plate fracture until imaged; supracondylar can hurt the brachial artery and nerves	Pulse and nerve checks before and after; splint as found, no reduction (Merck)

SAFETY A knee dislocation can tear the popliteal artery even with a pulse present; ischemia can stay hidden for hours.

TRACTION SPLINT AND PELVIC BINDER

DEVICE	USE FOR	DO NOT USE
Traction splint	Isolated closed midshaft femur fracture	Pelvis or hip injury, knee injury or injury near a joint, ankle or foot injury or avulsion. Many protocols add same-leg lower leg injury, partial amputation and open fracture. Classic list: follow local protocol
Pelvic binder or sheet	Suspected pelvic fracture from the mechanism or visible signs such as bruising; examination is unreliable, so do not wait for proof	Repeated rocking or springing of the pelvis; palpate once, gently

Binder level (greater trochanters) and shock care: see Trauma: Primary and Secondary Survey. Small children: traction splint per medical direction.

COMPARTMENT SYNDROME AND CRUSH

	CUES	ACTION
Compartment syndrome	Fracture, crush, tight splint or long lie; pain out of proportion, pain on passive stretch, tense limb, tingling; pulse lost late	Loosen splints and dressings, limb at heart level, rapid transport
Crush (long compression)	May look well; dark cola urine means muscle breakdown	Call ALS before release; oxygen, warmth, bleeding control
Paramedic	Release can cause hypovolemia, high potassium, arrhythmia	IV normal saline before release (not LR); monitor before and after

MECHANISM AND KINEMATICS

MECHANISM	EXPECT
Frontal, down and under	Knee, femur, hip dislocation, pelvis
Frontal, up and over	Head, neck, chest, abdomen
Side impact	Near-side chest, abdomen, pelvis, neck
Rear impact	Neck hyperextension then flexion
Lap belt only, belt bruise	Bowel, mesentery, pancreas, lumbar Chance fracture (Masudi 2017)
Airbag, short or close-seated driver	Face abrasions, forearm fractures, chest from the wheel; rarely upper neck (Huelke 1998)
Scapula fracture	High energy; 55% had lung injury: contusion, hemothorax, pneumothorax (Zarei Jelyani 2022)
Fall, feet first	Heels, legs, hips, lumbar spine
Gunshot	Energy rises with velocity squared; velocity mainly sets the temporary cavity; never label entry or exit
Blast	Pressure wave hits air-filled organs (ears, lungs); blast lung can appear later

2021 field triage, highest-level center: penetrating head, neck, torso or proximal limb wound; crushed, degloved, mangled or pulseless limb; amputation above wrist or ankle; suspected pelvic fracture; 2+ proximal long-bone fractures; bleeding needing a tourniquet or packing. Trauma center: intrusion over 12 in at the occupant (18 in anywhere), ejection, fall over 10 ft.

CLOSED INJURIES

- Contusion or hematoma: cold pack 15–20 minutes at a time, elevate, splint if painful
- Blow to the left upper abdomen with left shoulder pain: splenic bleeding; treat for shock
- Chest stab wound below the nipple line: assume the abdomen (liver right, spleen left) is hit too
- Burns: see the Burns page

Sources (34) are listed with links at erbasics.com/sheets/emt-soft-tissue-msk.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ER Basics is an independent study aid not affiliated with any certifying body.