

Key Points of Extremity Trauma:

Definitions:

- Partial Amputation: bone, muscle, or tissue keeps the amputated segment connected to the body
 - o Commonly seen w/ civilians
 - o Ideal treatment = revascularization
- Complete Amputation: no connecting tissue
 - o More common in military
 - o Ideal treatment = re-implantation
- Sharp/Guillotine Amputation: well-defined edges, minimal damage to associated anatomy
 - o Best prognosis for re-implantation
- Crush Amputation: extensive soft tissue and arterial damage
 - o Re-implantation less likely to be successful
- Avulsion Amputation: forceful overstretching & tearing of nerves & vascular tissue at many different levels from the site of separation
 - o Re-implantation unlikely

Mangled Extremity Severity Score (MESS)

Tissue Injury	Characteristics	Details	Points
1	Low energy	Stab wound, simple closed #, small-caliber	1
2	Medium energy	Opened #, dislocate, moderate crush	2
3	High energy	Short gun, high velocity	3
4	Massive crush	Logging, rail road	4
Shock			
1	Normotension	BP stable	0
2	Hypotensive transient	BP unstable, SBP < 90 mmHg	1
3	Hypotension	In OR	2
Ischemia			
1	None	No signs of ischemia	0
2	Mild	Diminish pulse	1
3	Moderate	Paresthesia, diminish motor activity	2
4	Advanced	Pulseless	3
Age			
1	< 30 y		0
2	30 - 50 y		1
3	> 50 y		2

Score ≤ 6: salvageable limb, Score ≥ 7: highly predictive of amputation

A Classification System for Penetrating Vascular Trauma⁴

Wound Category	Description	Feasibility of Hemorrhage Control
Tier 1	Located in the extremities/periphery, distal to the axillary or common femoral vessels	Amenable to immediate control with direct pressure and tourniquets
Tier 2	Occur in the axillae and groin	Hemorrhage control can be difficult
Tier 3	Intracavitary wounds in the thorax, abdomen, or pelvis	Often are fatal unless injury is minor and prompt surgical control is available; heroic measures, such as resuscitative thoracotomy or resuscitation endovascular balloon occlusion of the aorta (REBOA), may provide temporization

Nerve Testing and Associations

Nerve	Associated Vessel(s)	Motor Testing	Sensory Testing
Median nerve	Brachial artery and radial artery	Wrist flexion, "OK" sign	Palmar index and middle fingers
Radial nerve	Radial artery	Wrist extension, "thumbs up"	Dorsal web space
Ulnar nerve	Ulnar artery	Finger spreading	5th digit and ulnar side of 4th digit
Femoral nerve	Femoral artery	Knee extension	Anteromedial thigh and shin
Tibial nerve	Popliteal artery, posterior tibial artery	Plantarflexion	Sole of foot
Peroneal nerve	Anterior tibial artery*	Dorsiflexion	Anterolateral shin, dorsum of foot

(*The anterior tibial artery runs with the deep branch of the peroneal nerve, which innervates the first webspace on the foot; it continues on into the dorsalis pedis artery.)

Hard signs

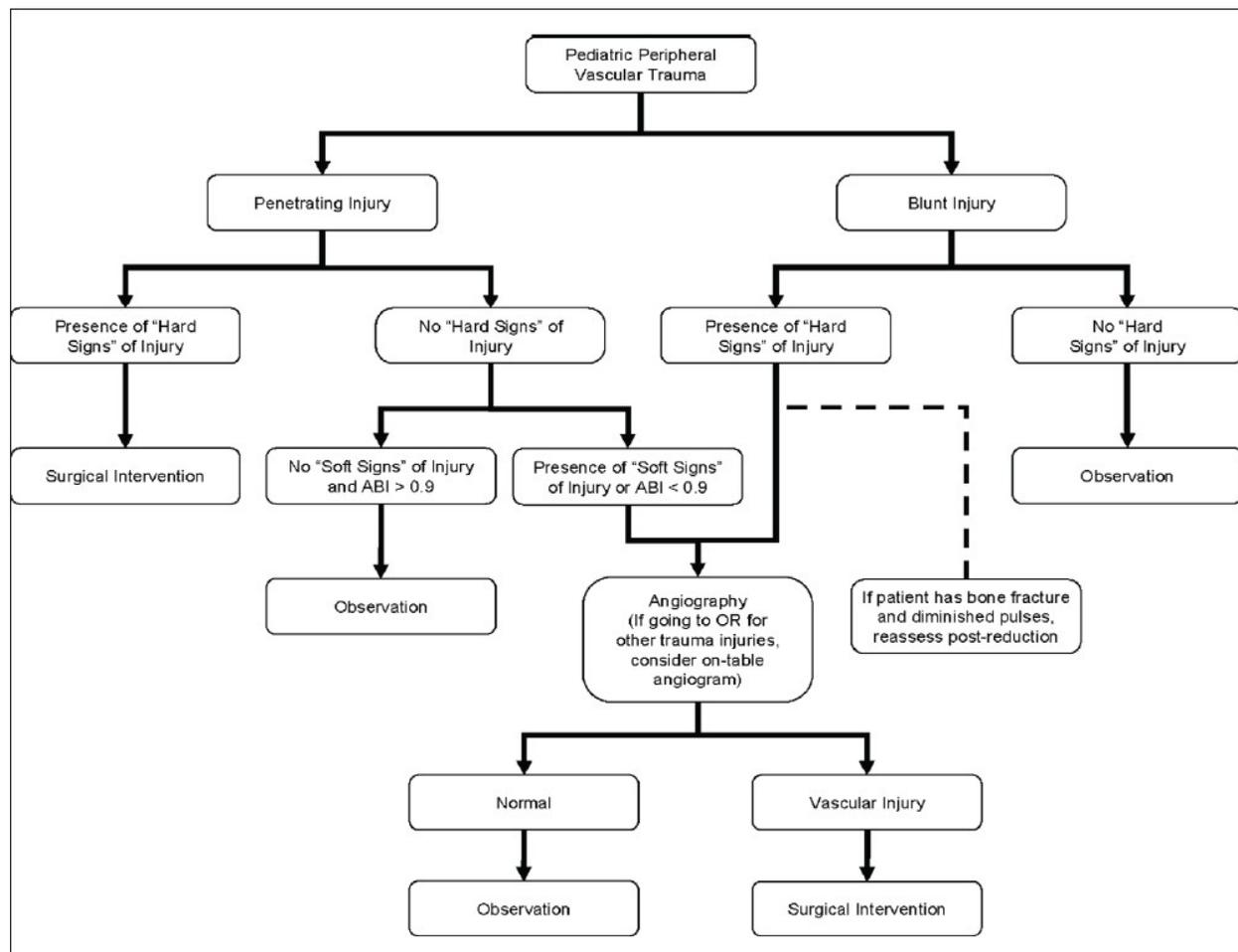
Rapid external hemorrhage
Expanding or pulsatile hematoma

Signs of distal ischemia
Thrill/bruit
Absent pulses

Soft signs

History of arterial bleeding
Proximity of wound/blunt injury to a named artery

Nonpulsatile hematoma
Neurologic deficit



PENETRATING TRAUMA → ENSURE HEMORRHAGE CONTROL BEFORE ABCs! "CABC"
"RESUSCITATE BEFORE YOUR INTUBATE" & "LIFE OVER LIMB"