Crush Injury

Assessment

Pediatric Pearls:
- Use pediatric dosing of medications or electrical therapy for a pediatric patient < 37 kg and as defined by the PEDIA Tape.
- Pediatric hypotension is defined as SBP < 70 + (age in years x 2) mmHg

Signs & Symptoms:
- Compartment Syndrome
  - Pain on passive stretch
  - Paresthesia
  - Paralysis
  - Pallor
  - Pulselessness
- Hypoperfusion
- Hypotension
- Altered Mental Status

Differential:
- Skin irritant exposure
- Dust concentrations in airway
- Hypo/Hyperthermia
- Hyperkalemia
- Dehydration
- Additional trauma

Clinical Management Options

PL1	PL2	PL3	PL4	PL5	PL6	
■	■	■	■	■	■	• Treatment in a confined space should be performed only by appropriately trained personnel. • Air quality monitoring should be conducted and documented prior to entry into confined space. Continuous air quality monitoring must be maintained once contact is made with victim and when any rescuer is in a confined space. Document air quality measurement at patient location on PCR. • Remove rings, bracelets, and other constricting items • N95 mask PRN for dust environment • Oxygen: Target SPO2 92% - 96%
	■	■	■	■	■	• Nebulized Albuterol or saline PRN for patients with dust concentrations in airway.
		■	■	■	■	• Vascular access x2 at 1.5 L/hr of Isotonic Crystalloid during extrication. If adequate hemodynamics, then may reduce to 500 mL/hr of Isotonic Crystalloid after extrication.
			■	■	■	• Continuous $ETCO_2$ and ECG monitoring once practical. • If goes into cardiac arrest, then treat for hyperkalemia with both Calcium Chloride and Sodium Bicarbonate in conjunction with cardiac arrest guidelines.
				■	■	• Push Sodium Bicarbonate immediately prior to release • Add Sodium Bicarbonate to each liter of Isotonic Crystalloid • If MAP ≥ 65 and no respiratory failure, then Fentanyl for pain and Ketamine for refractory pain • If MAP < 65 and/or respiratory failure, then Ketamine for pain

Consult Online Medical Control As Needed

Pearls:
- Refer to drug formulary charts for all medication dosing for both adults and pediatric patients.
- Hydration should begin prior to extrication whenever possible. Large volume resuscitation prior to removal of the crush object and extrication is critical to preventing secondary renal failure and death.
- Crush injury is usually seen with compression of 4-6 hrs. but may occur in as little as 20 min.
- If possible, monitor patient for signs of compartment syndrome.
- Crush injury victims can 3rd space > 12L in the first 48 hours.
- Elderly patients should be monitored closely for volume overload but do NOT withhold fluids unless clinical signs/symptoms of volume overload.
- The larger the mass crushed (ie more limbs) the greater the likelihood of severe rhabdomyolysis and renal failure.
- Crush injury may cause profound electrolyte disturbances resulting in dysrhythmias. Monitor as soon as practically possible.
- Do not overlook treatment of additional injuries, airway compromise, hypothermia/ hyperthermia.
- ETCO2 if multiple doses of Narcotic Medication administered.