Section: ALS Hazardous Materials
Subject: CONFINED SPACE MEDICINE
Section #: 346.13
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1. Indications:
    a. A patient who has been subject to a significant blunt force trauma over a significant body surface area (BSA) for a more than 150 minutes.
        i. The significance of the BSA involved and the compressive force shall be determined at the discretion of the senior MSOT paramedic on the scene.
    b. If there is doubt, contact the HCFR medical director for guidance.

2. Contraindications - Do not initiate this protocol for:
    a. Patients who would be triaged as expectant under HCFR triage protocols.
    b. Unmovable patients in a location that is or will imminently become an immediate life threat.

3. Initial Assessment
    a. Obtain medically relevant information prior to physical contact with the patient.
    b. Upon first physical contact initiate standard HCFR assessment protocols with the following variations:
        i. Apply oxygen only if the patient's room air oxygen saturation (SpO_2) is less than 93%.
        ii. Titrate to maintain SpO_2 between 93% and 95%.
        iii. For purposes of this protocol, the external jugular vein shall be considered to be a peripheral vein.
    c. Assess for the presence of any risk factors for crush injury. If any indications (see above) are present, and there are no contraindications, continue with this protocol.
    d. Contact the HCFR Medical Director and provide a status report.

4. MSOT Medic Level Care - Crush Injury treatment and Crush Syndrome prophylaxis
    a. Initial resuscitation and management
        i. Administer **normal saline** 20 mL/kg as a bolus.
            1. If the patient does not have a peripheral pulse, repeat the bolus up to two more times (60 mL/kg max.) until peripheral pulses are regained.
            2. Notify Medic 1 or the HCFR Medical Director for >60 mL/kg of fluid resuscitation is needed.
        ii. Utilize HCFR PROTOCOL PAIN MANAGEMENT if indicated
        iii. If not done so already, place appropriate personal protective equipment on the patient.
    b. Pre-release management
        i. Maintain the patient as warm and dry as permitted by the immediate environment.
        ii. If possible, monitor the cardiac rhythm.
        iii. If ordered by a physician, draw blood for point of care (if available) or off-site analysis.
        iv. Vital signs shall be recorded at least hourly, and also every time there is a significant movement of the patient.
        v. Once physical contact has been made with the patient, maintain at least one caregiver with the patient at all times unless safety concerns supervene.
        vi. Proceed with hyperkalemia treatment if ordered to do so by the HCFR Medical Director or Medic 1
            1. Hyperkalemia treatment:
                a. Administer **sodium bicarbonate** 1 mEq/kg IV/IO over 10 minutes.
                b. Administer **dextrose** and **insulin**:
                    i. For adult patients: **regular insulin** 10 units IV/IO, immediately followed by **dextrose** 50% solution in water ($D_{50}W$) 25 grams (50 mL) IV/IO.

ii. For pediatric patients: **regular insulin** 0.1 units/kg IV/IO, immediately followed by 25% dextrose ($D_{25}W$) 0.5 gm/kg (2 mL/kg) IV/IO.

c. Administer **albuterol**:
   i. Adults and Pediatrics weighing ≥ 20 kg., 5 mg nebulized.
   ii. Pediatrics weighing < 20 kg., 2.5 mg nebulized.

c. Immediately pre-release
   i. Administer **albuterol** if it has not been given within the past hour.
      1. Adults and Pediatrics weighing ≥ 20 kg., 5 mg nebulized.
      2. Pediatrics weighing < 20 kg., 2.5 mg nebulized.
   ii. Administer **normal saline** (0.9% NaCl) 20 mL/kg bolus IV/IO.
   iii. Administer **sodium bicarbonate** 1.0 mEq/kg IV/IO if it has not been given within the past hour.

d. Immediate post-release
   i. Be prepared to immediately treat the following conditions:
      1. Hypovolemia with **normal saline** (0.9% NaCl) 20 mL/kg bolus IV/IO.
      2. Hyperkalemia (as above).
      3. Cardiac arrhythmias – see appropriate HCFR protocol

e. After the patient has been moved to a secure location:
   i. Variations to standard HCFR assessment protocols:
      1. Repeat vital signs hourly, after every significant move, and upon arrival at the medical treatment area.
      2. Monitor blood glucose hourly.
      3. Document urine output hourly and report to the physician the urine's color and appearance, pH (if possible), and hourly flow rate.
      4. Apply a clean dry dressing to all disruptions in the skin on the crushed extremity.
      5. Apply a non-compressive splint to any affected extremities.
      6. Do not apply ice to the affected area.
      7. Maintain any affected extremities level with the patient's heart.
   ii. Initiate the following maintenance fluid: add 50 mEq of **sodium bicarbonate** to a premixed liter of **dextrose** 5% in water (D_5W) plus 0.45% **normal saline** (D_5 ½NS) and infuse at 2 mL/kg/hr.

5. ALS evaluation/transport criteria:
   a. All patients treated under this protocol are ALS
   b. Once stabilized, a crush injury patient may be transferred to another agency at the discretion of the Incident Commander.