

# Crush Syndrome

## Protocol

Douglas County KS EMS System

November 2022

**Referenced Procedures:** None

### **Goals of Patient Care:**

- Safety of provider and extrication of patient
- Recognition and treatment of dangers related to crush syndrome

### **Medications:**

<u>ADULT Medications:</u>	<u>PEDIATRIC Medications:</u> Refer to HandTevy
<ul style="list-style-type: none"><li>• <b>Fentanyl:</b> 25-100mcg IV/IO Slow Push, IM/IN (Titrate to effect, may repeat 5-10 min) (<i>Total Max. dose 400mcg</i>)</li><li>• <b>Albuterol:</b> 5 mg in 6cc NS (double respiratory dose) repeat PRN</li><li>• <b>Normal Saline:</b> 500mL, IV/IO for dehydration, hemodynamic instability</li><li>☎ <b>Sodium Bicarb:</b> 50 mEq IV/IO slow push</li><li>☎ <b>Calcium Chloride:</b> 1 g IV/IO push (<i>contraindicated without pulse in crush syndrome</i>)</li></ul>	<ul style="list-style-type: none"><li>• <b>Fentanyl:</b> 1 mcg/kg, up to 100mcg. IV/IO Slow Push, IM/IN (Titrate to effect, may repeat 5-10 min) (<i>Total Max. dose 400mcg</i>)</li><li>• <b>Albuterol:</b> 2.5 mg in 3cc NS repeat PRN</li><li>• <b>Normal Saline:</b> 20 ml/kg, IV/IO for dehydration, hemodynamic instability</li><li>☎ <b>Sodium Bicarb:</b> 1.0 meq/kg IV/IO Push</li><li>☎ <b>Calcium Chloride:</b> 20mg/kg IV/IO push (<i>contraindicated without pulse in crush syndrome</i>)</li></ul>

### **Background:**

Crush syndrome can present with any patient that is trapped under a crushing weight for a significant length of time. These patients may be trapped from earthquakes, tornadoes, building collapse or entrapment in storage facilities. If a patient has been entrapped for a prolonged period (usually >2 hours, certainly >4 hours) with prolonged compression of one of more extremities, they are in grave danger. Suspect crush syndrome in patients requiring extrication or in those with such as an upper or lower extremity(s) and/or trunk pinned against a hard surface, particularly if accompanied by sensory loss, flaccid paralysis, and/or peaked T-waves(hyperkalemia)

If this subset of patients does not receive aggressive medical treatment during the extrication, they may suffer the three serious dangers of crush syndrome:

- Hypovolemia
- Life-threatening cardiac arrhythmias
- Renal failure

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### **Procedures/Interventions:**

#### **Prolonged Entrapment (Potential Crush Syndrome)**

##### **PRIOR TO EXTRICATION:**

- Support ABC's per General Trauma Protocol
- Secure airway and administer oxygen as required
- Establish IV/IO access
- ☎ Consider contacting medical control

When vital signs are stabilized, consider the following:

- Fluid challenge initially (500ml) and consider repeat doses
- Administer Fentanyl as needed for pain
- ☎ Administer Sodium Bicarbonate
  - *Sodium Bicarb and Calcium Chloride cannot be administered in the same line, unless first flushed with a minimum of 50cc NS*
- Administer Albuterol to treat hyperkalemia
- ☎ Administer Calcium Chloride if life threatening changes occur
  - Sodium Bicarb and Calcium Chloride cannot be administered in the same line, unless first flushed with a minimum of 50cc NS
- Consider then environment and warm/cool pt. as appropriate
- Monitor cardiac rhythm and treat dysrhythmias as needed

#### **For Associated Penetrating Extremity Wounds**

- Apply pressure with sterile gauze pads and elevate to control external bleeding. If direct pressure fails- use a tourniquet on the proximal part of the extremity to control bleeding
- Splint extremity
- Transport while monitoring vital signs frequently

### **Considerations**

Considerations for crews on scene prior to ambulance arrival

- Determine the entrapment time along with basic history of the patient and the incident.
- Consider then environment and warm/cool pt. as appropriate
- Apply pressure with sterile gauze pads and elevate to control external bleeding. If direct pressure fails- use a tourniquet on the proximal part of the extremity to control bleeding