## Compartment Syndrome

**Definition:** Compartment Syndrome is caused when there is an injury involving swelling of the tissue inside a confining fibrous sheath of muscle compartments. This swelling causes further destruction of intra-compartmental muscle and nerves and loss of arterial blood flow.

Signs and symptoms:

- Pain out of proportion to exam which is increased with movement, touch, pressure, and stretch
- Loss of feeling below compartment radiating farther away
- Pressure, tight palpable tenseness
- Pulselessness (late sign)
- 6 P's. Pain out of proportion to injury, Paleness, Paresthesia, Paralysis, Poikilothermia (limb assumes room temperature), Pulseless

1. Follow the **General Pre-Hospital Care Protocol**
2. Protect c-spine, per **Spinal Precautions Protocol**, as indicated
3. Identify and treat life threats per **General Trauma Protocol**
4. Provide psychological support.
5. Assess for signs of compartment syndrome, noting onset time. Make sure to reassess throughout the treatment of patient for any changes.
    a. **Do not ice** (ice increases vasoconstriction)
    b. **Do not elevate** (keep in position found or position of comfort)
6. Splint for comfort or protection only when necessary.
7. Avoid tight compression or constriction Establish vascular access
    a. Administer IV fluids to achieve or maintain systolic blood pressure of 90 mm Hg.
    b. Consider push-dose epinephrine 10-20mcg IVP every 3-5 minutes to maintain systolic blood pressure of 90 mm Hg.
    c. Correct hypovolemia with crystalloid solution at infusion rate of 500 mL/Hr. Lactated Ringers is preferred over NS but use what is available at the time.

8. Treat Rhabdomyolysis, if suspected or present
    a. Ensure adequate hydration – administer 1-2 L/hr crystralloid
        i. Caution in patients with heart failure or renal failure
    b. Alkalinize urine - Mix 150 mL (3 amps) of 8.4% sodium bicarb with 1 L Normal Saline and infuse at 200 mL/hr
        i. Adjust rate to urine pH of > 6.5

c. Utilize pH test strips to access pH. If blood pH is greater than 7.45, discontinue bicarb infusion
d. Monitor vital signs and urine pH level and volume hourly and treat exam findings per protocol and USAR medical director direction.
    i. pH becomes acidotic, administer sodium bicarbonate drip
    ii. blood in urine, consider calcium, 1 gm IVP over 5 minutes.
    iii. Urine output < 50 mL/hr, consider increasing fluids as long as no pulmonary edema is present.
e. Assess osmolarity and electrolytes and venous blood gas every 6 hours by drawing a blood sample per **USAR Blood Draw Protocol** and sending the blood to the local hospital for testing.

9. Obtain 12 lead ECG
10. Treat for pain following **Pain Management Protocol**
11. Analyze for evidence of Crush Injury per **USAR Crush Injury/Syndrome Protocol**.
12. If distal pulse is absent or becomes absent during treatment, the Medical Specialist Paramedic MUST communicate with the Rescue Team Leader and the USAR Team Physician as fasciotomy may be necessary and timeliness of extrication is crucial.