ACUTE COMPARTMENT SYNDROME

A surgical emergency due to the result of excessive pressure within a fascial compartment. If left untreated, it will result in ischemia, infarction, and possible Volkmann's contracture

TOP THINGS THE EM PROVIDER NEEDS TO KNOW

- Most common in patients < 35 years old
- Males 10 x more likely
- Most common in lower leg (Anterior and deep compartment) and then the forearm (Volar compartment)
- Time sensitive: Know the 5 P's of increasing pressure
- Delta Pressure = Diastolic Pressure - Compartment Pressure
- Elevate the at risk extremity, remove any dressing, treat pain
- Have a low threshold for Stryker, check pressure
- Rhabdomyolysis is present in > 40% of traumatic ACS
- Key to diagnosis is clinical suspicion and repeat exams

TESTING

Appropriate imaging, CK level, Renal function, LFT's, Urinalysis, and urine myoglobin are recommended . CK > 1000 units/mL or myoglobinuria suggest ACS and CK levels will continue to rise during the course of ACS

CAUSES OF ACUTE COMPARTMENT SYNDROME

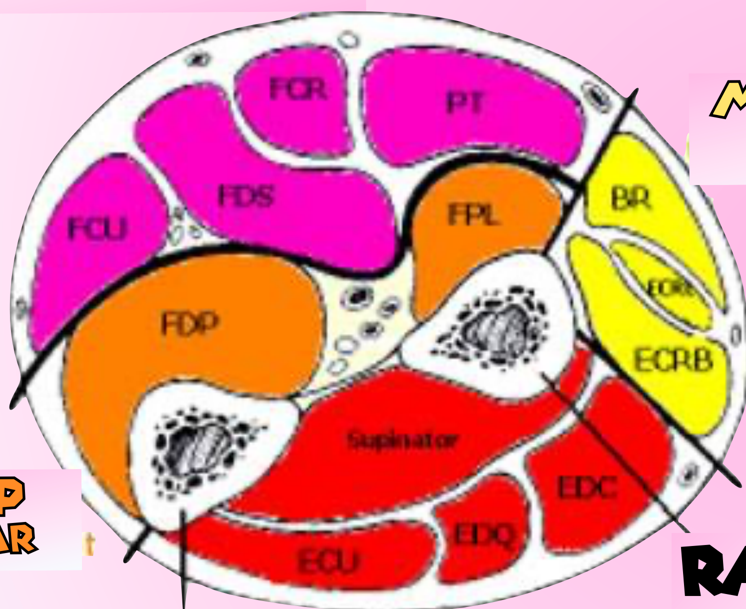
- FRACTURES/TRAUMA
- INFILTRATED INFUSION
- VASCULAR INJURY
- BLEEDING DISORDERS
- REPERFUSION
- RHABDOMYOLYSIS
- BURNS/COLD
- CASTS, DRESSINGS, SPLINTS
- VENOUS OBSTRUCTION
- NEPHROTIC SYNDROME
- LYING ON LIMB
- SNAKE BITE
- SEIZURES/ECCLAMPSIA

THE COMPARTMENTS

FOREARM

SUPERFICIAL VOLAR

MOBILE WAD



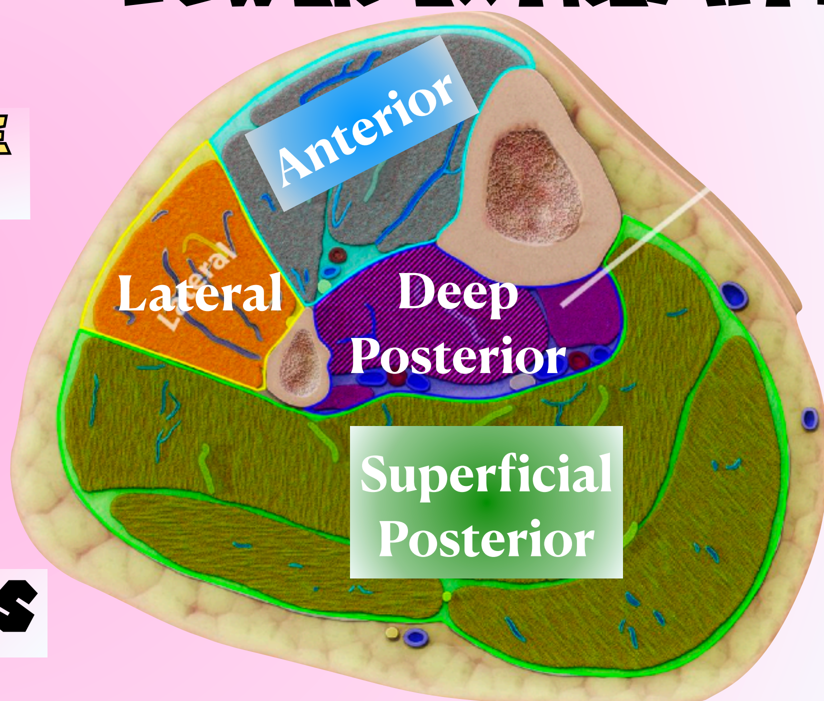
DEEP VOLAR

RADIUS

ULNA

DORSAL COMPARTMENT

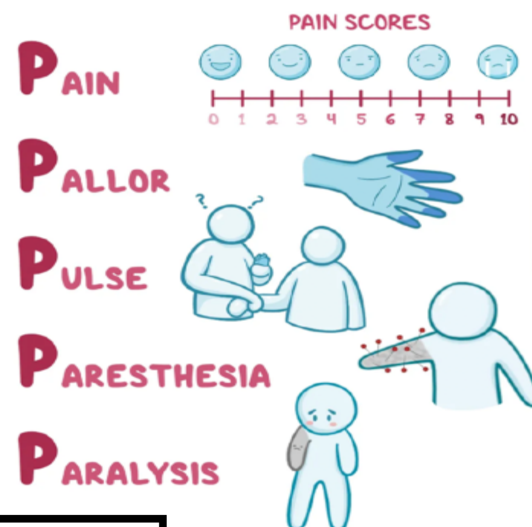
LOWER EXTREMITY



COMPARTMENT PRESSURE

Normal	0-10 mmHg
Elevated	20-30 mmHg
Emergency	30 + mmHg

THE 5 P'S



DELTA PRESSURE

DIASTOLIC BP - COMPARTMENT PRESSURE

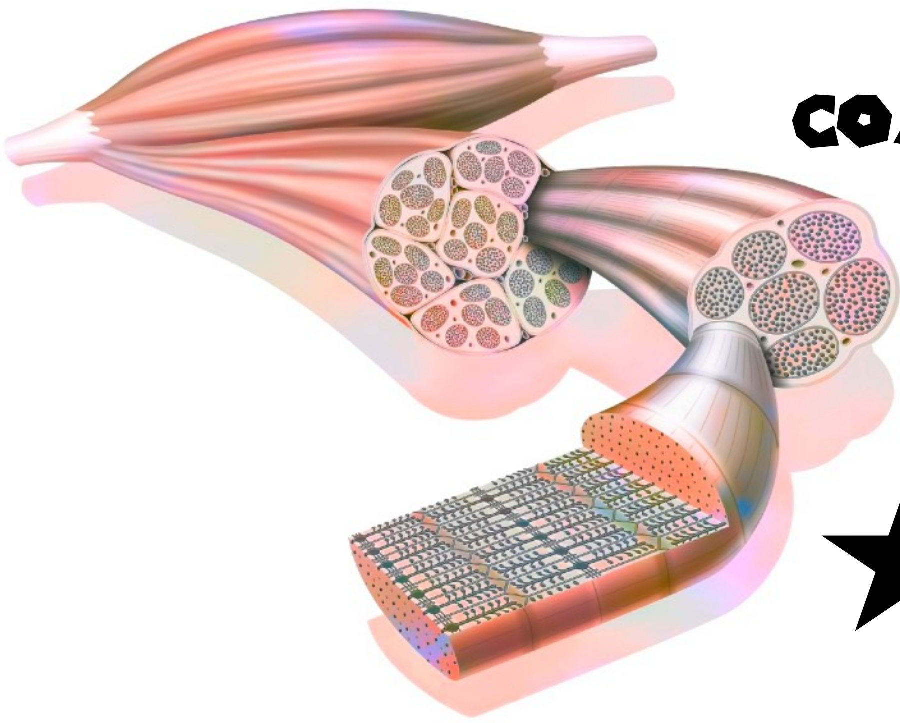
IS THE PERFUSION PRESSURE OF THE COMPARTMENT

THE LOWER THE DELTA PRESSURE THE WORSE THE PERFUSION

<20 IS A DEFINITIVE INDICATION FOR FASCIOTOMY

WHEN TO CUT: FASCIOTOMY INDICATIONS

HIGH SUSPICION
UNEQUIVOCAL CLINICAL FINDINGS
SIGNIFICANT TISSUE INJURY
DELTA PRESSURE < 20-25 MMHG
COMPARTMENT PRESSURE > 30
INTERRUPTION IN ARTERIAL PERFUSION > 4 HRS



HOW TO MEASURE COMPARTMENT PRESSURES:

CLICK TO WATCH THE VIDEO:

STRYKER NEEDLE ON EM:RAP

CAPUTO PEARL:

★ Time is Money in compartment syndrome. Always keep on the radar, check, and recheck. Educate your patients at high risk.

MUSCLE DAMAGE

3-4 HRS: REVERSIBLE
6 HRS: VARIABLE
8 HRS: IRREVERSIBLE

NERVE DAMAGE

2 HRS: CONDUCTION
4 HRS: NEUROPRAXIA
6 HRS: IRREVERSIBLE MOTOR AND SENSORY LOSS

TREATMENT OF COMPARTMENT SYNDROME:

Definitive treatment is a fasciotomy
Obtain surgical consultation
Calculate/document Compartment + Delta pressure
Elevate the affected extremity (Level of heart)
Remove any constrictive dressings
Reduce any displaced fractures
Treat pain, avoid nerve blocks
Resuscitate/treat hypotension

REFERENCES:

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