Orthopaedics

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Contents

- Emergencies
- Fractures
- Dislocations & Ruptures
- Wound & Bone Healing
- Complications

- Not Covering…
  - Paeds/Congenital
  - Rheum – OA, RA, Gout, OP
  - Dermatology/Micro/Plastics - Necrotising Fasciitis

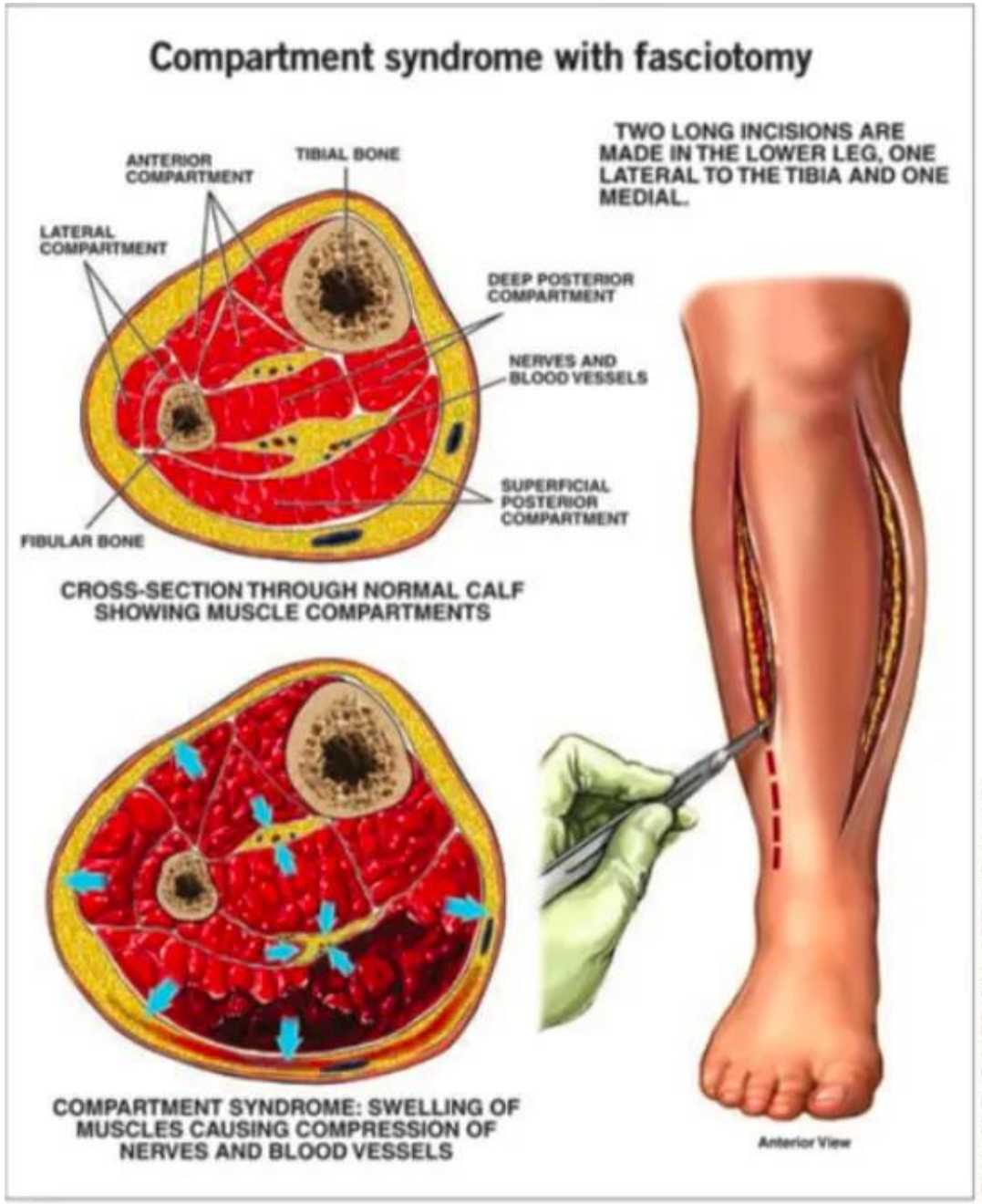
Compartment Syndrome

- Fascia surrounding muscles
- Facia doesn't stretch much
  ∴ small swelling = large pressure changes
- ↑ Pressure in compartments = ↓Blood supply
  = Hypoxia → Necrosis → Swelling
- Normally caused by Trauma (# or crush)
- LIMB AND LIFE THREATENING

<u>Sx</u>:

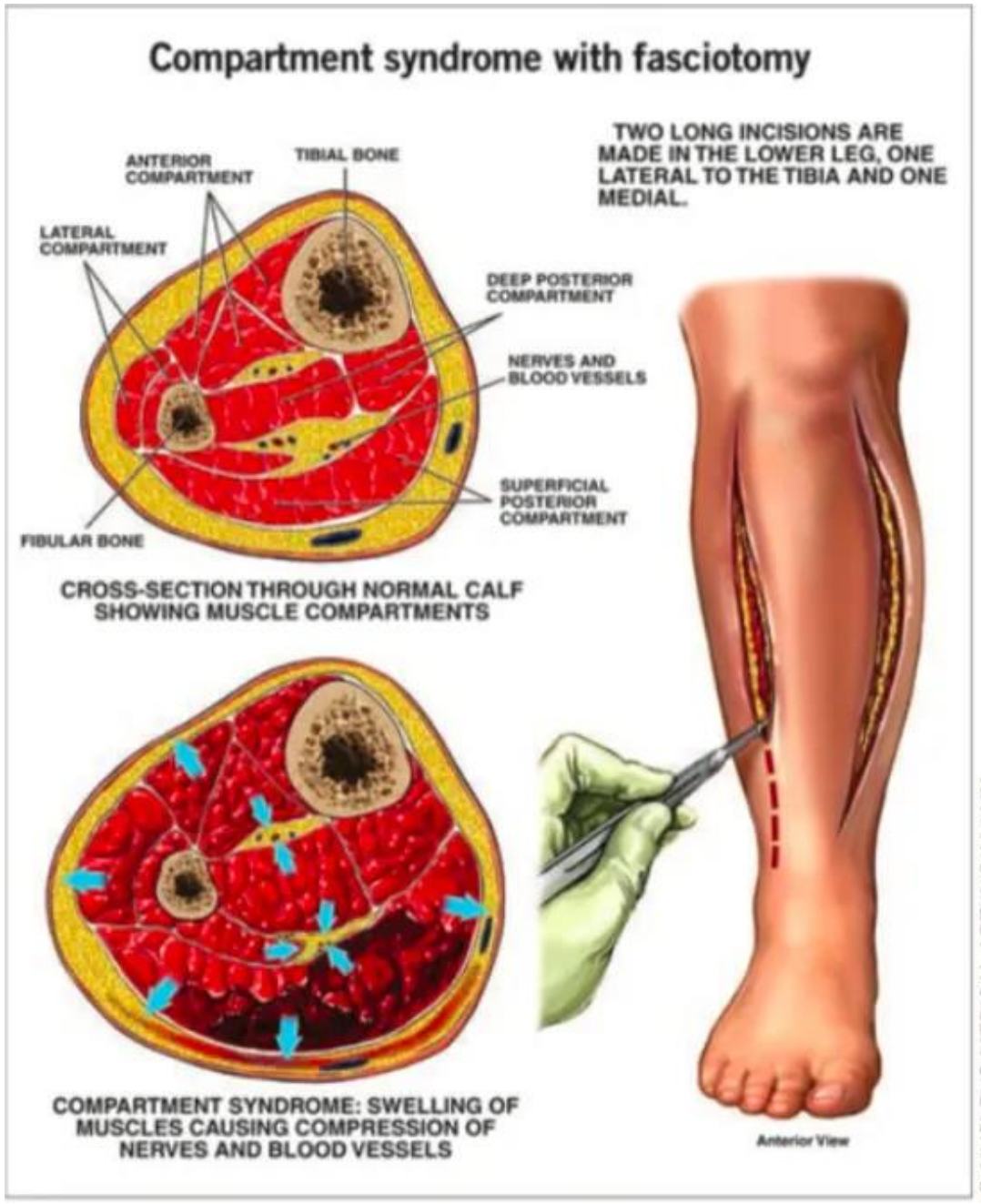
- <u>Extremely</u> painful
- Paraesthesia
- Poor pulse(s)
- Pale

Pain on passive movement/stretching



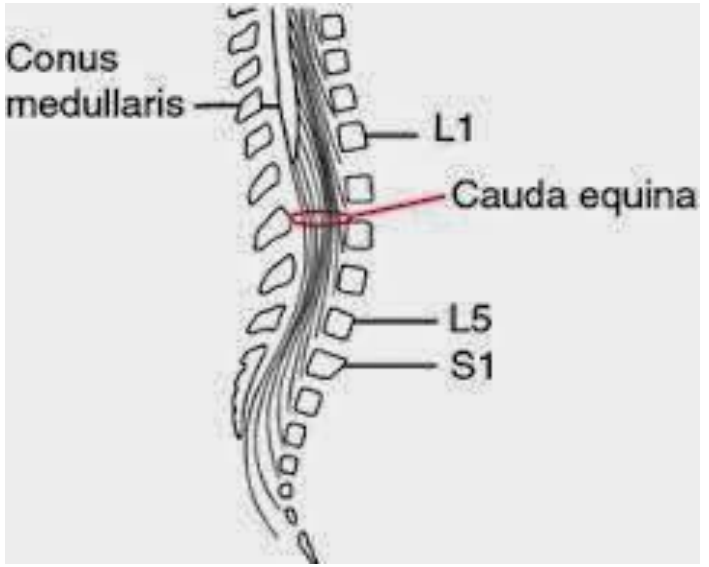
Compartment Syndrome

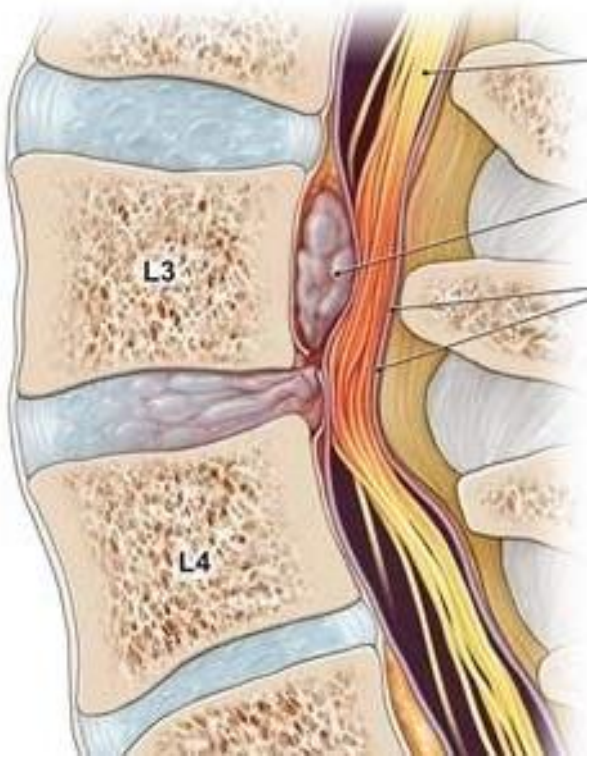
- Treatment = <u>Fasciotomy</u>
- Also… reverse the cause e.g. cast



Cauda Equina Syndrome

- Many causes (think of space loss/pressure)
  - Cancer
  - Trauma
  - Abscess
  - Haematoma
  - Stenosis
  - Herniation





- Saddle Anaesthesia
- Incontinence/Retention
- Poor Anal Tone (PR)
- Paralysis ± Sensory Loss

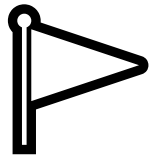
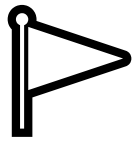
- MRI
- PR – ↓Tone, Absent Anal Wink/Reflex
- Surgical Decompression

Saddle Anaesthesia S3 – S5

Sciatic-type pain L4 – S3

Urinary Weakness (Detrusor)

Anal Wink S2-S4

 Back Pain 

- Cauda Equina
- Spinal #
- Cancer
- Infection

https://cks.nice.org.uk/topics/back-pain-low-without-radiculopathy/diagnosis/red-flag-symptoms-signs/

Septic Joint/Arthritis

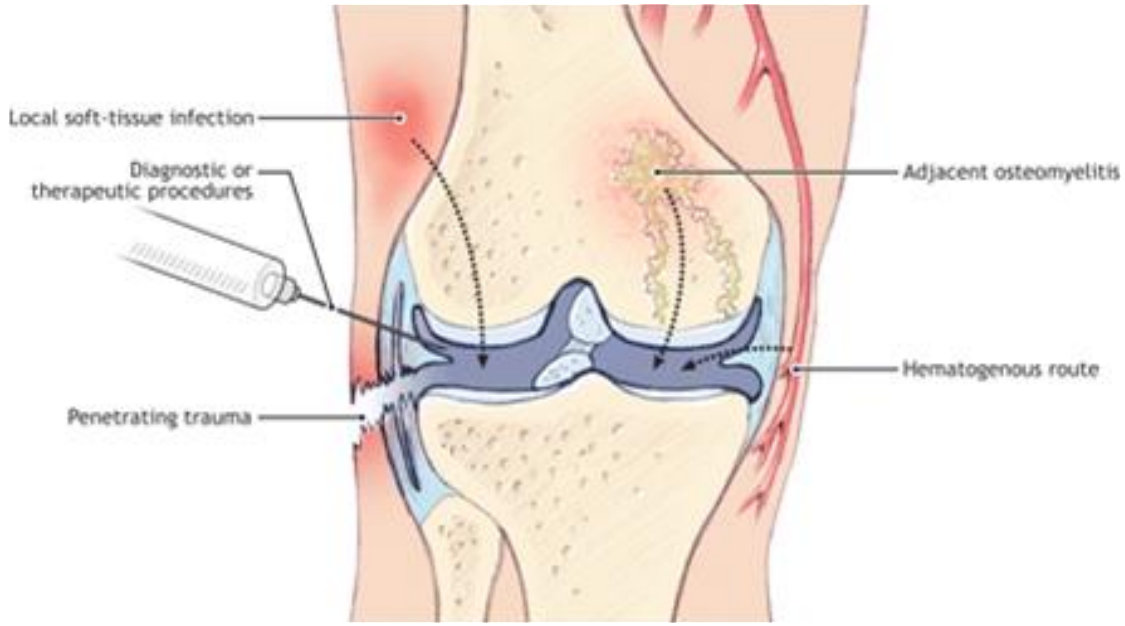
- Knee in >50%
- Act fast – Can destroy a joint in a day

Risks:

- Age
- DM
- Immunosuppressed
- IV drug use
- Established Arthritis
- Joint Procedures
- Trauma

Organisms:

- Staph Aureus 40%
- Streptococci's ~30%
- Neisseria Gonococcus
- Gram -ve



Septic Joint/Arthritis

Ix:

- Imaging (XR)
- Aspirate - Cloudy Yellow, lots of WBC (Neutrophils) but can be low early on

Tx:

- IV Abx
  - Flucloxacillin (Skin) or Clindamycin
  - MRSA (Vancomycin)

- Arthroscopic Washout / Open Debridement (if replacement)

Cases

12♂ Fractures his wrist falling in the school playground. Which of these is the correct order of bone healing?

A. Remodelling > Haematoma > Soft Callus > Hard Callus
B. Haematoma > Soft Callus > Hard Callus > Remodelling
C. Haematoma > Soft Callus > Remodelling > Hard Callus
D. Haematoma > Remodelling > Soft Callus > Hard Callus

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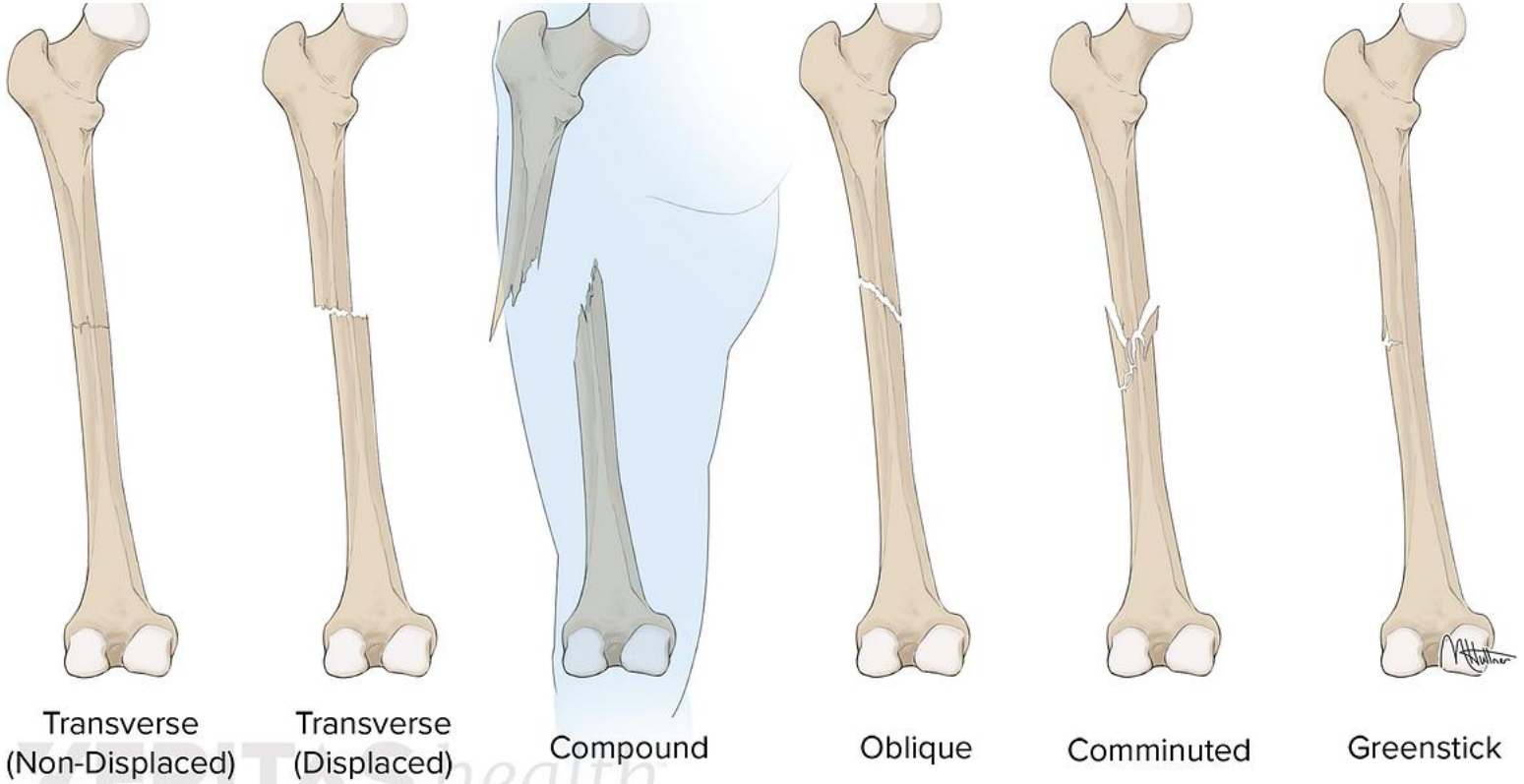
#Fractures



<u>Describe</u>: Open/closed, displaced, type, site, surrounding

🏳 Pathological 🏳

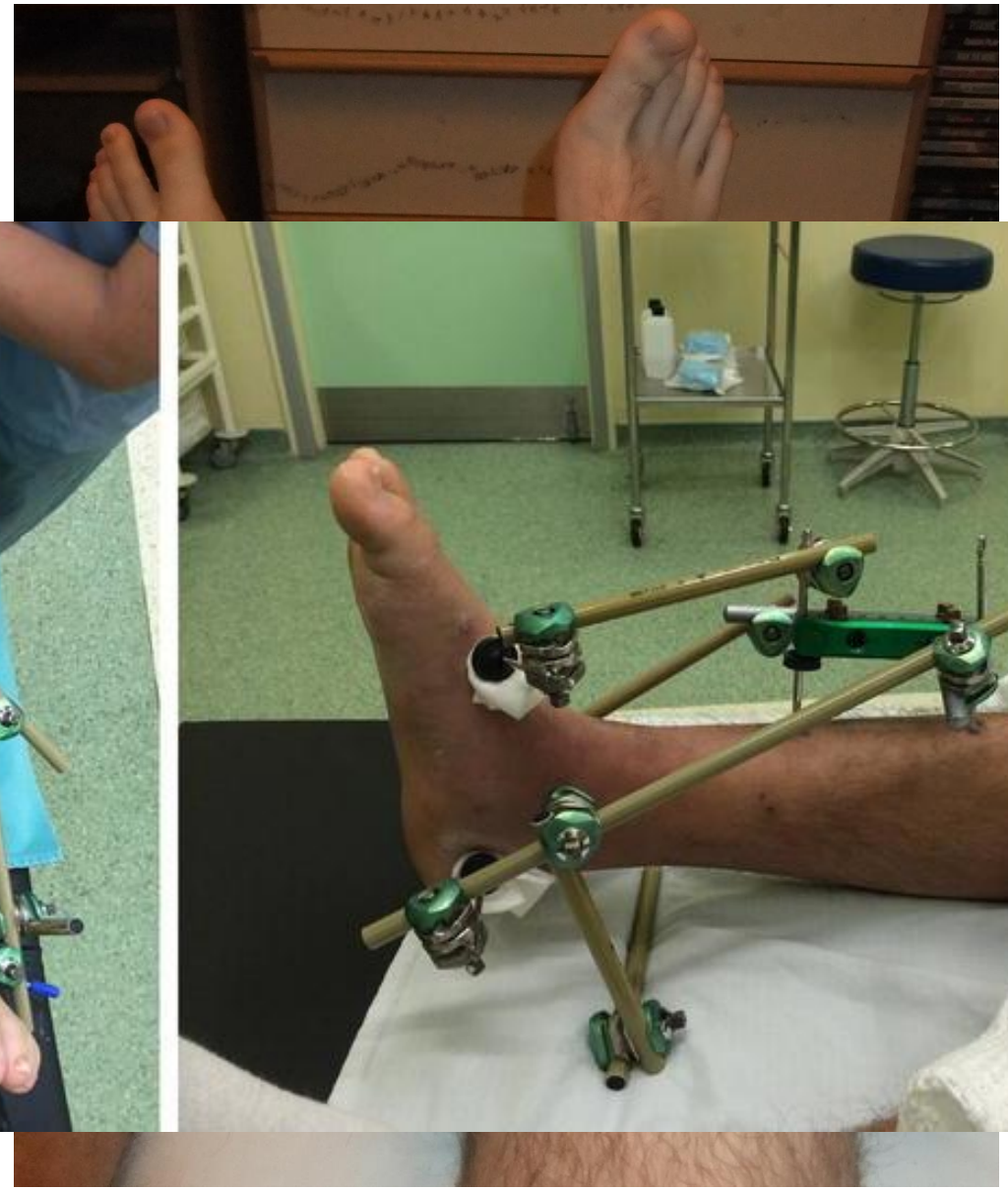
- Low impact #
- Not even “impact”
  - Carrying shopping bags
  - Sitting down
  - Pulling handbrake
- Other worrying Sx
  - Weight loss
  - Haemoptysis etc..
- Hx of Malignancy
  - Lung
  - Breast
  - Prostate
  - Thyroid
  - Kidney

Principles

- Analgesia
- 2x X-Ray Views
- Immobilise/Reduce

Fix it:

- Cast
- ORIF
  - Failed Cast
  - 2#’s in a limb
  - Open #s
  - Intraarticular
- Ex-Fix

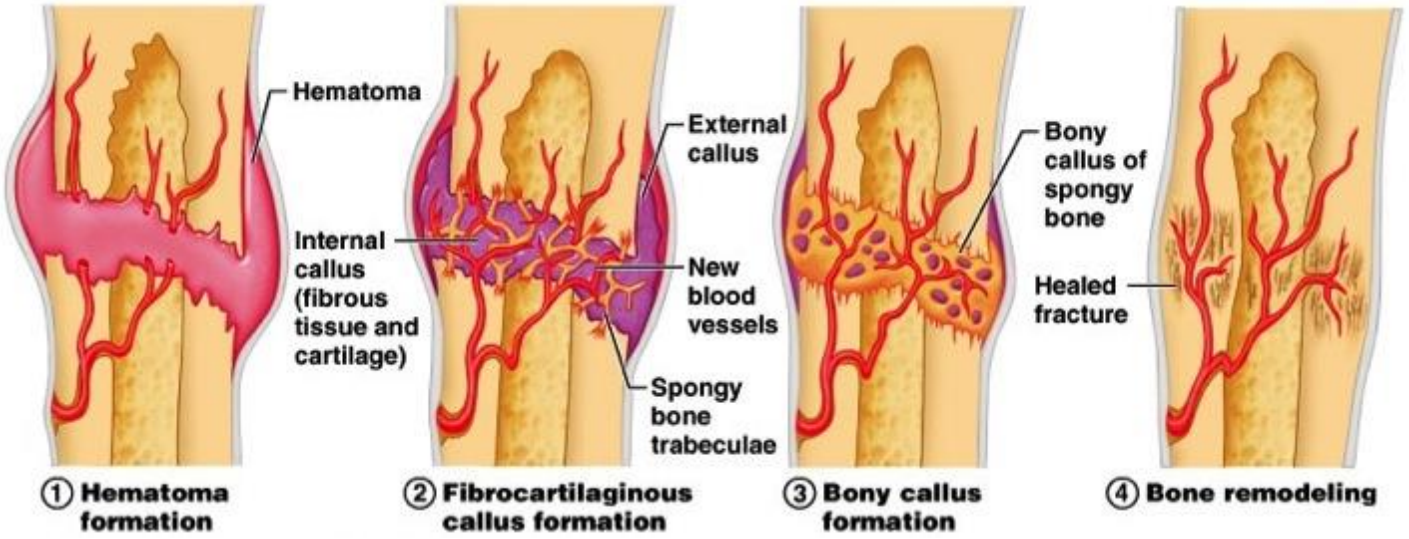


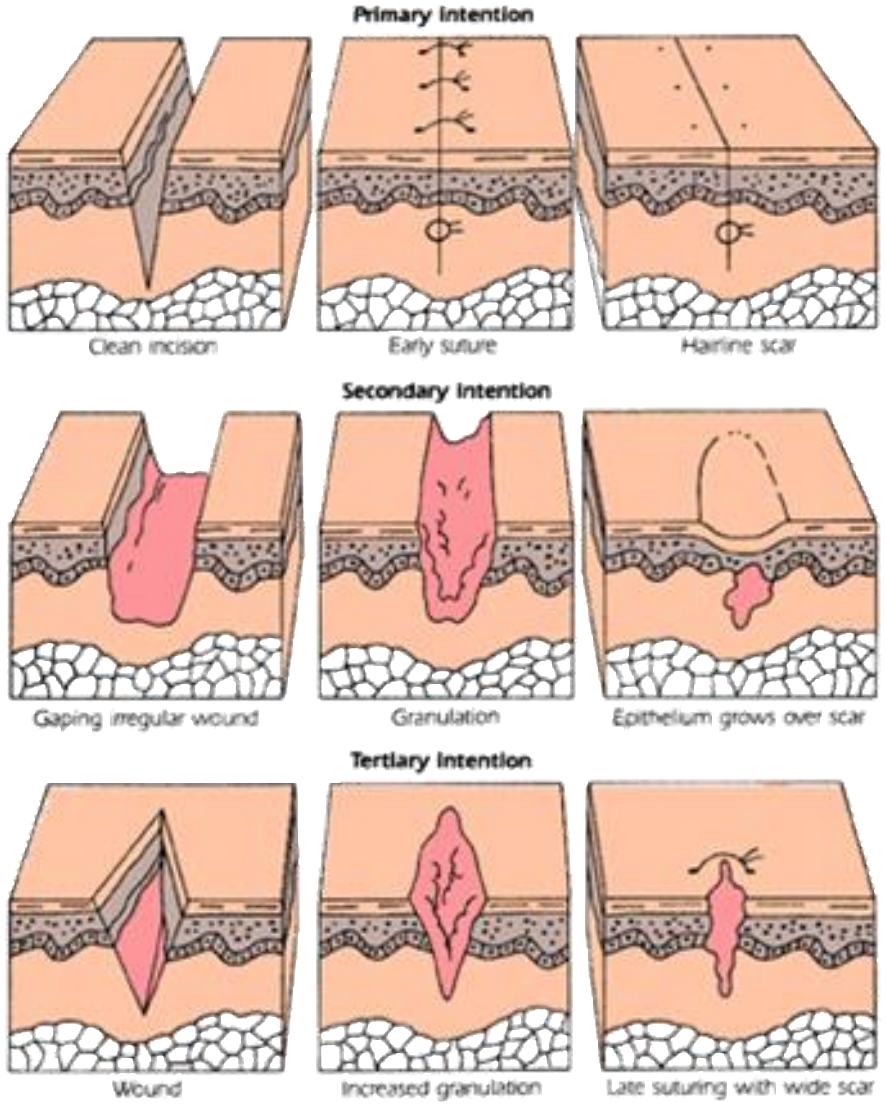
Healing

x3 Types on Wound Healing

x4 Stages of Bone Healing

Haematoma Soft Callus Hard Callus Remodelling





Healing – The Doubling Rule

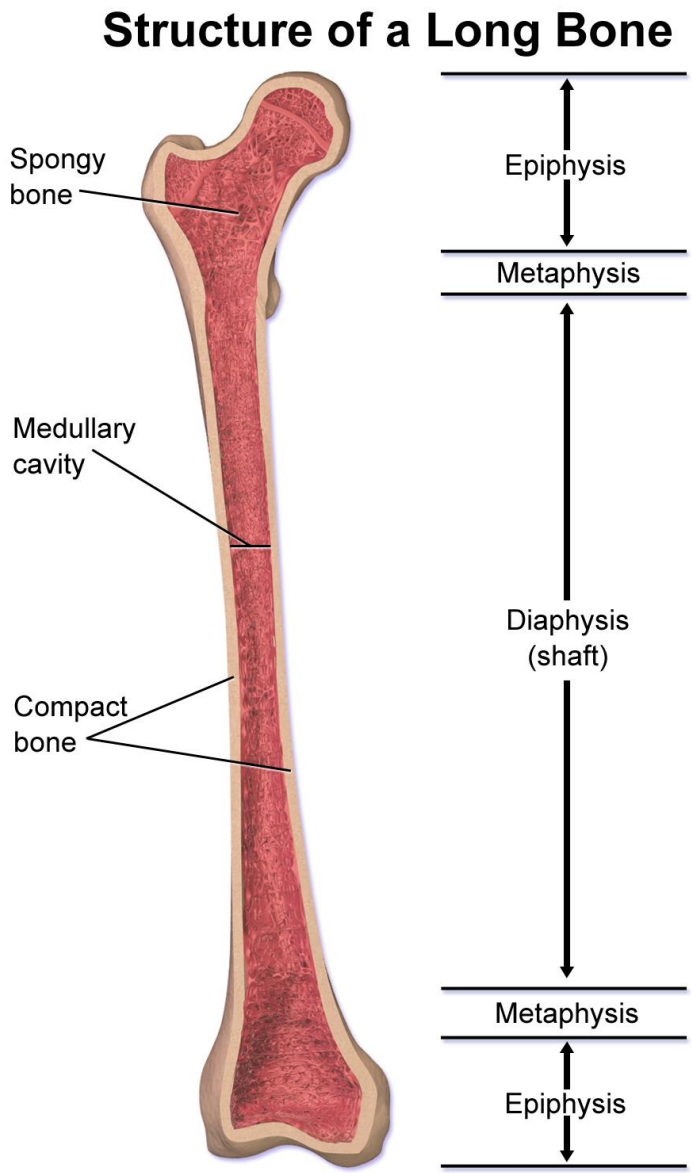
Shortest Time = ~3 Weeks

Any “complicating factor” doubles the healing time.

The “Best” Fracture:

- **Child**
- **Upper Limb**
- **Closed**
- **Metaphyseal**

E.g. A adult (6) with a closed (6) diaphyseal (12) of the femur (24)



#NOF

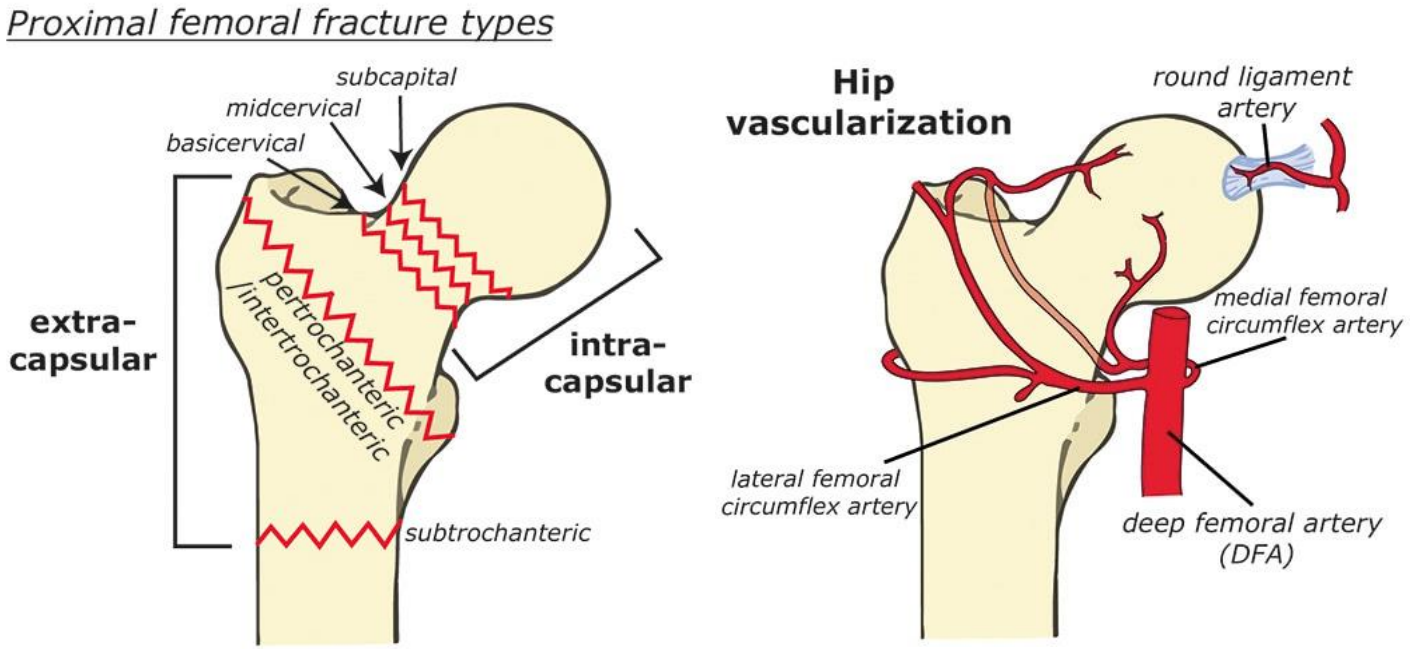
Think of #NOF:

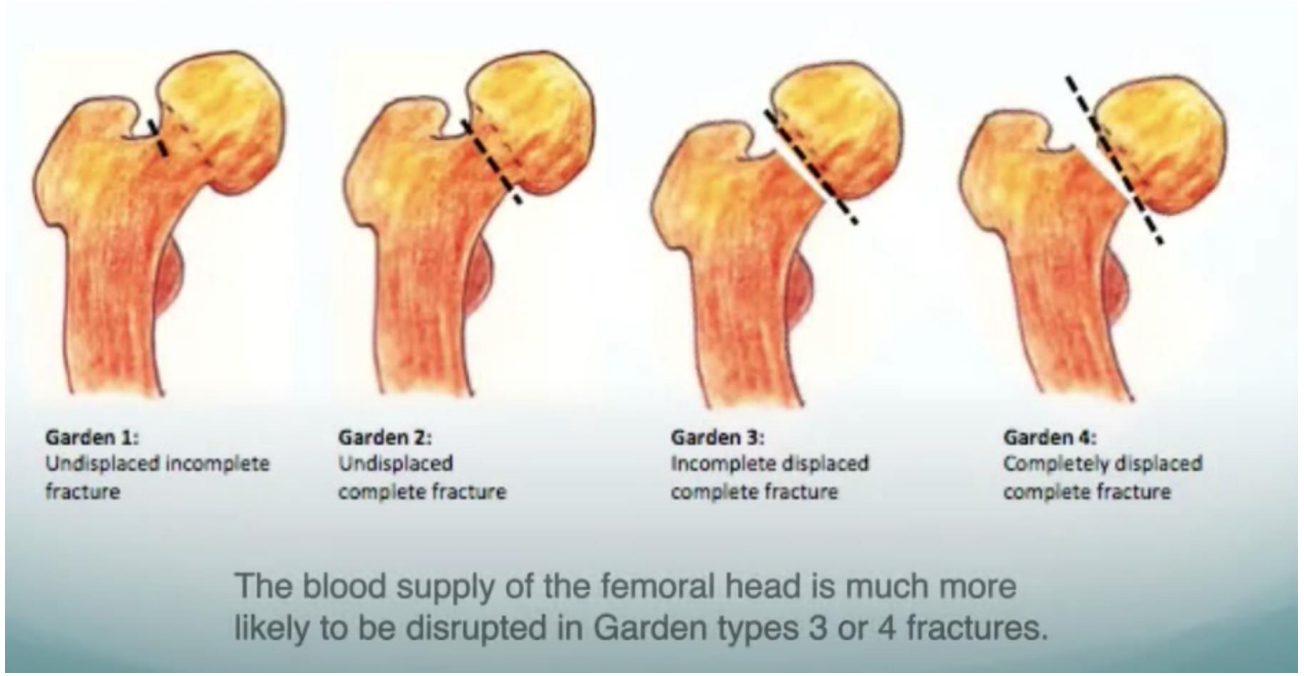
- Elderly
- Falls (Especially IP)
- High Energy
- Osteoporosis

Shortened & Externally Rotation

Blood supply – Circumflex arteries from the **Profunda Femoris**

Intracapsular # = Disrupt the supply to the femoral head = AVN

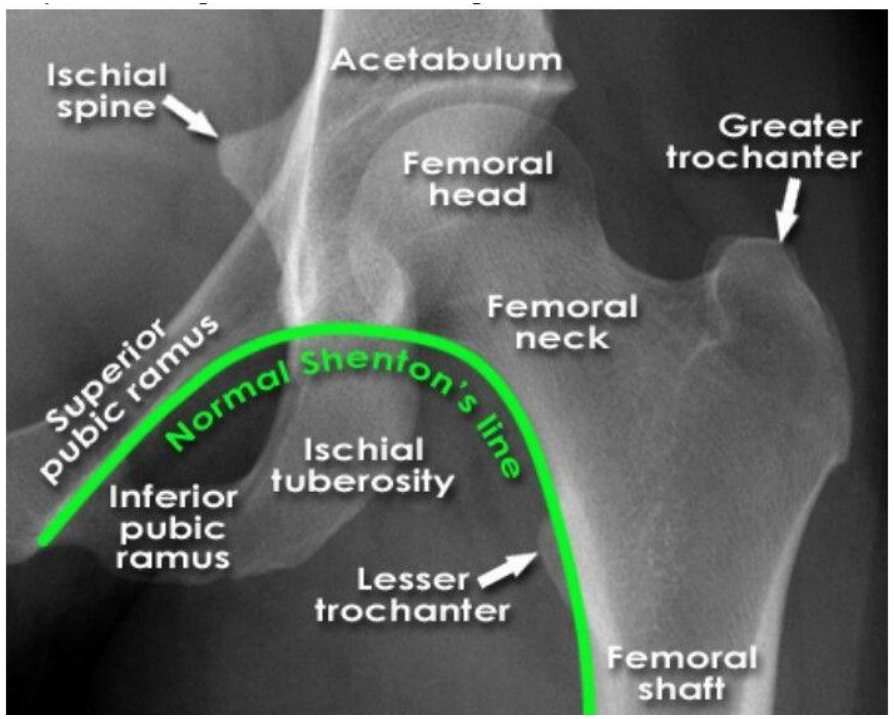


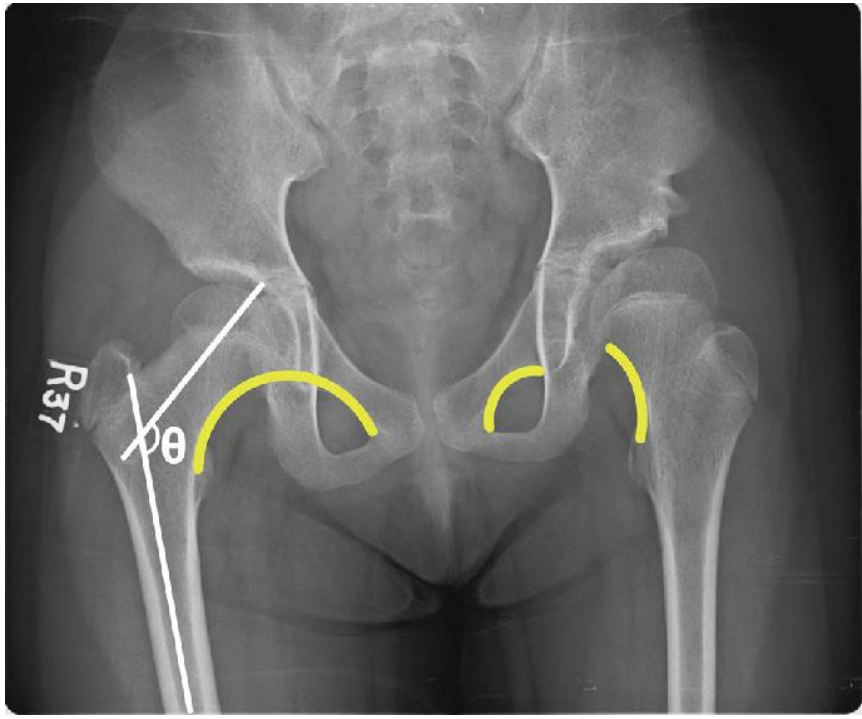


#NOF

XR Hip:

- Sometimes obvious
- Discontinuation of **Shenton's line**

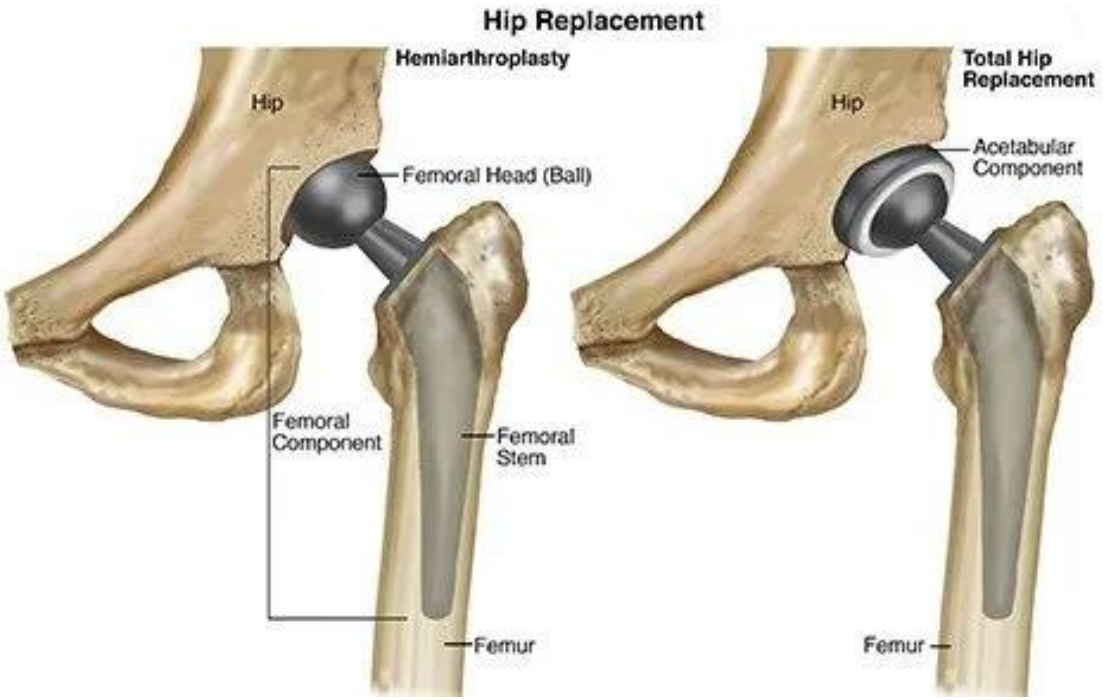


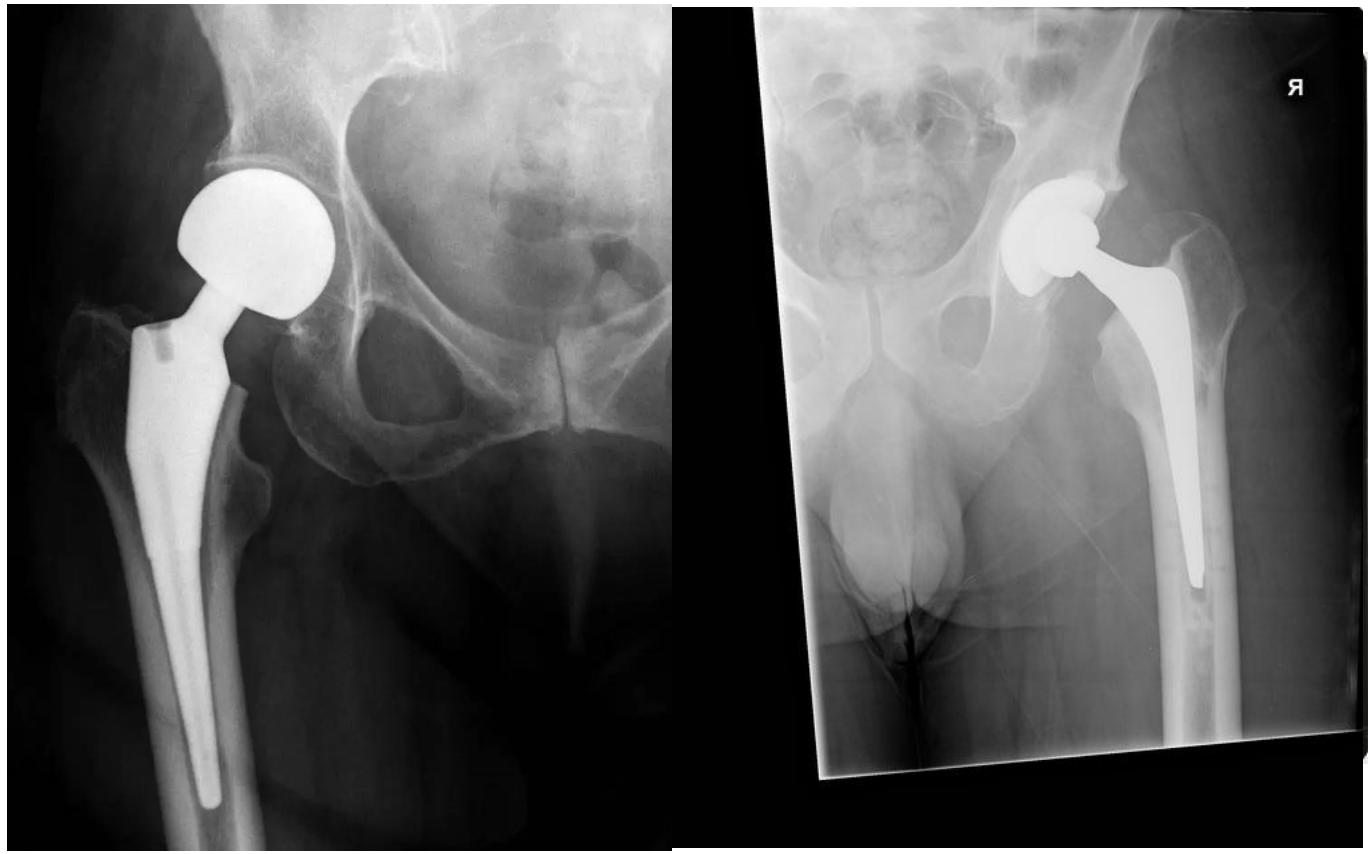


Broadly Speaking:

Intracapsular # = **Joint replacement** (Hemi / Total Arthroplasty) due to the risk of damaged blood supply & AVN

Extracapsular # = Intramedullary Nail or **DHS** (Dynamic Hip Screw) as blood supply intact





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#Pelvis

#Colles

Shoulder Dislocation

Almost always **Anterior** (>95%)

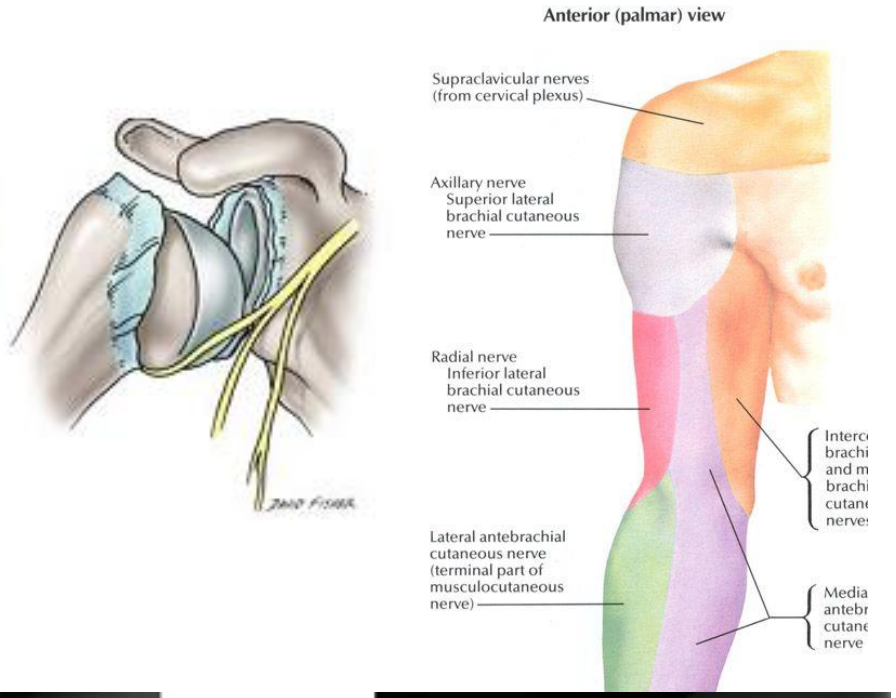
Almost always from Trauma – shoulder is weakest when it is **abducted** and **externally rotated**.

Axillary Nerve:

Dermatome = Lower Deltoid

Treatment is prompt relocation.

Recurrent = Surgery



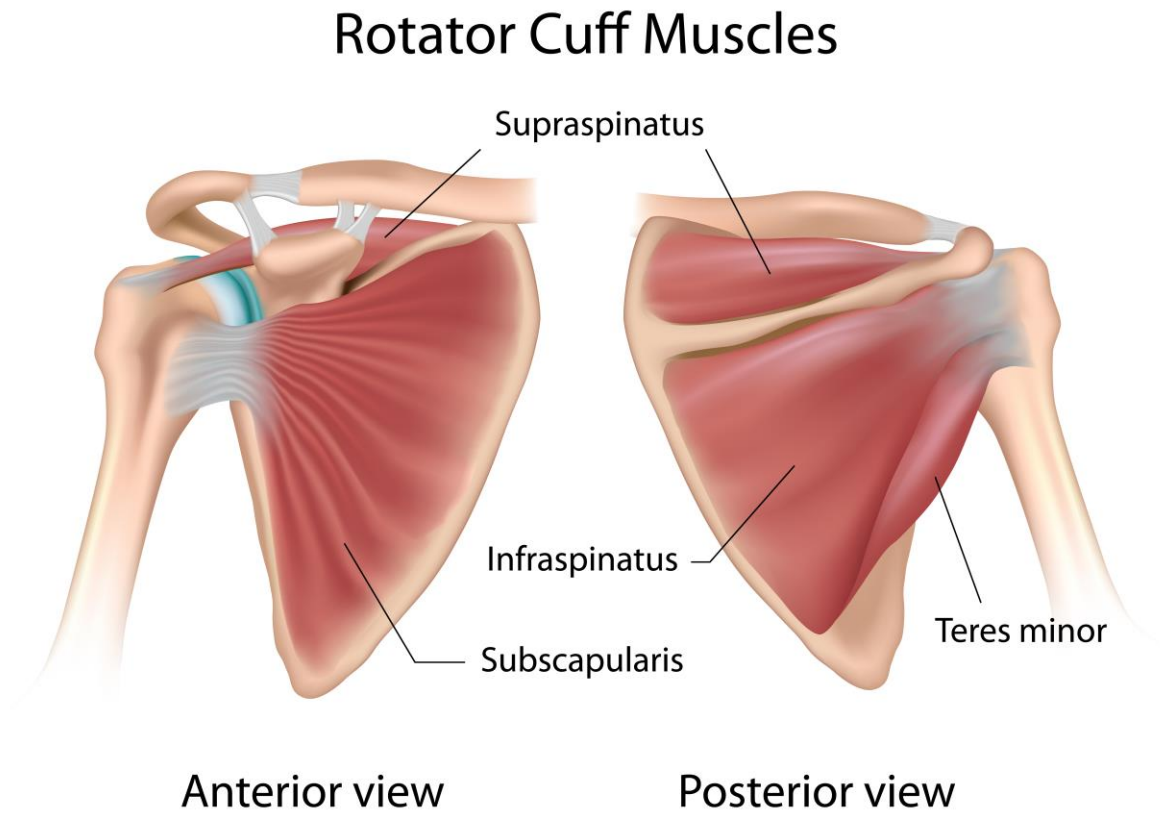
Normal Shoulder X-Ray

Dislocated Shoulder X-Ray

Rotator Cuff

SISTA Minor

- Supraspinatus (Abduction)
- Infraspinatus (Ext. Rot.)
- Subscapularis (Int. Rot. + Adduction)
- Teres Minor (Ext Rot.)



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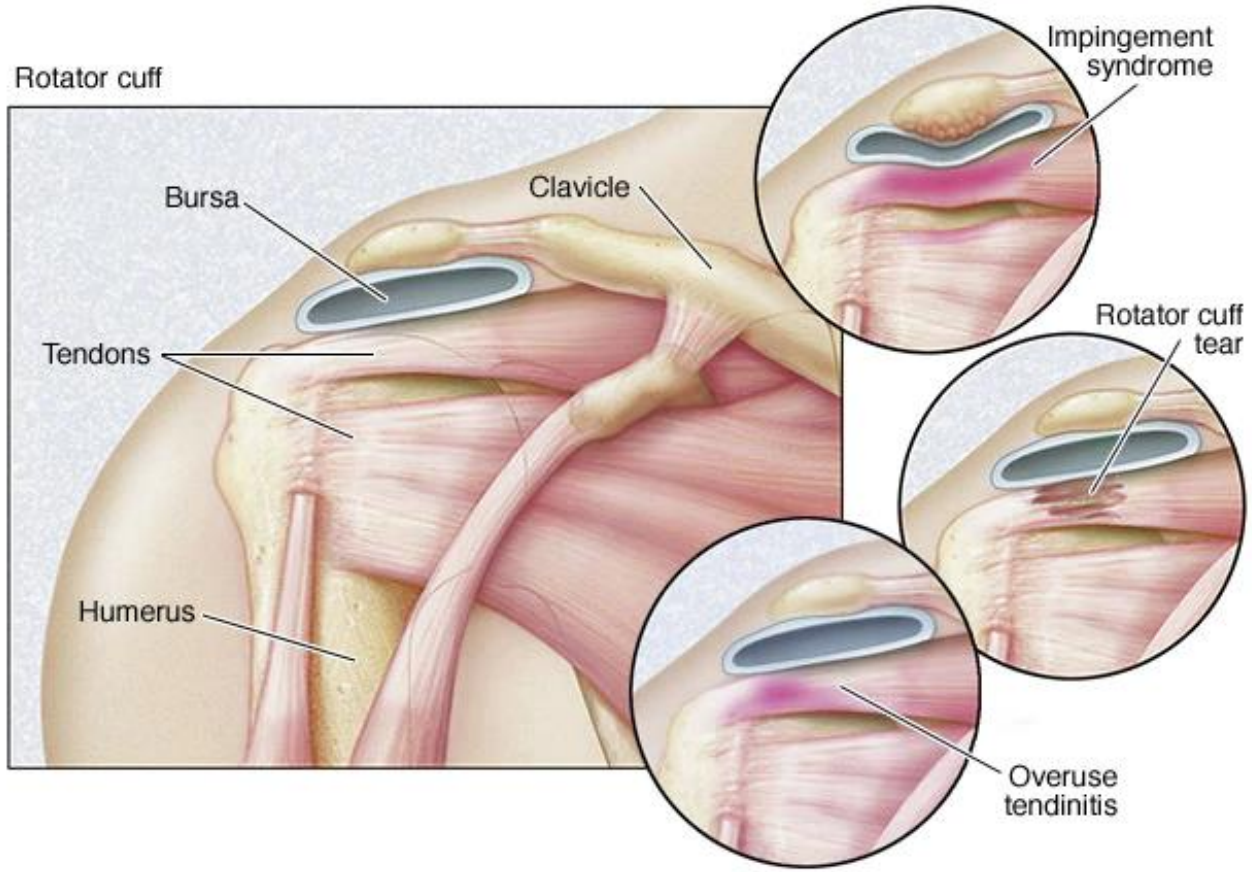
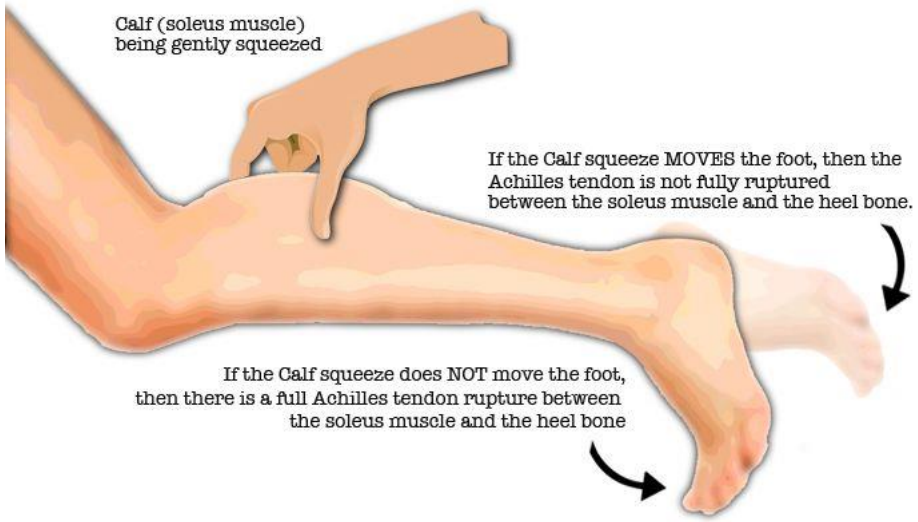


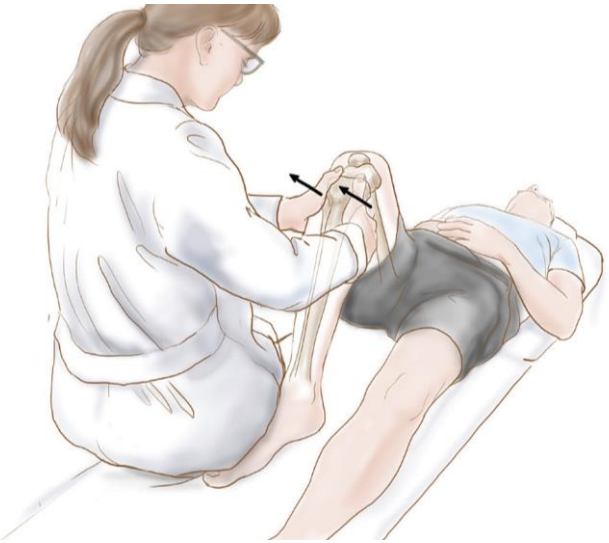
Achilles Tendon Rupture



Calf squeeze test for Achilles tendon rupture

Tx:
- Surgical repair
- Conservative = Casting Regime

ACL



Often due to:
- Blow to Tibia
- Sudden stop
- Rotation/Rapid change in direction
- Bad landing

Tx:
- Athletes/Young = Surgical Repair
- Conservative = Rest & Physio

Carpel Tunnel Syndrome

Compression of the Median Nerve as it passes under the Flexor Retinaculum. Often at night: pain & tingling in the median nerve area. Wasting of the thenar eminence.

Ix:

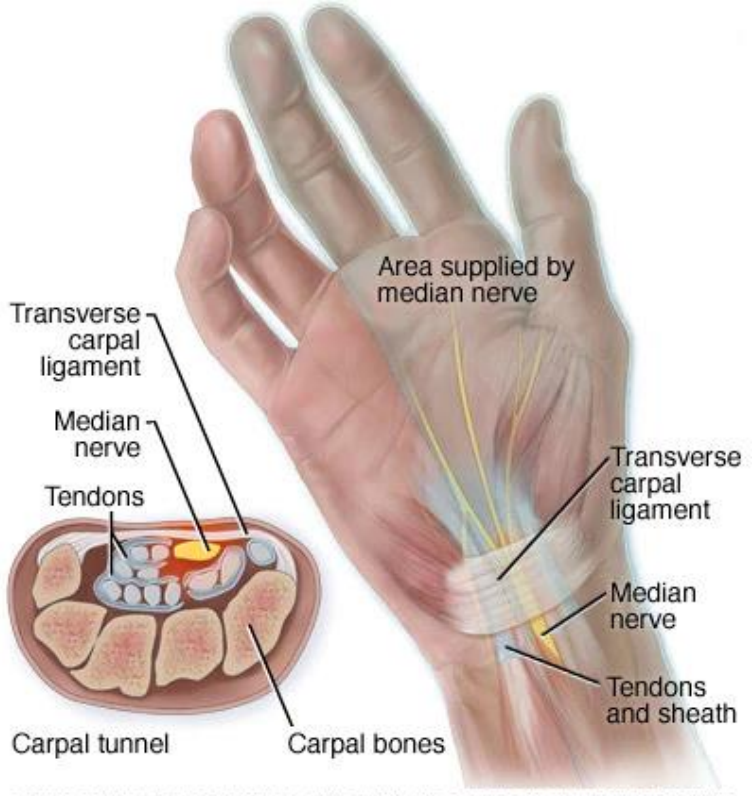
- Often Clinical
- Phalen's/Tinel's

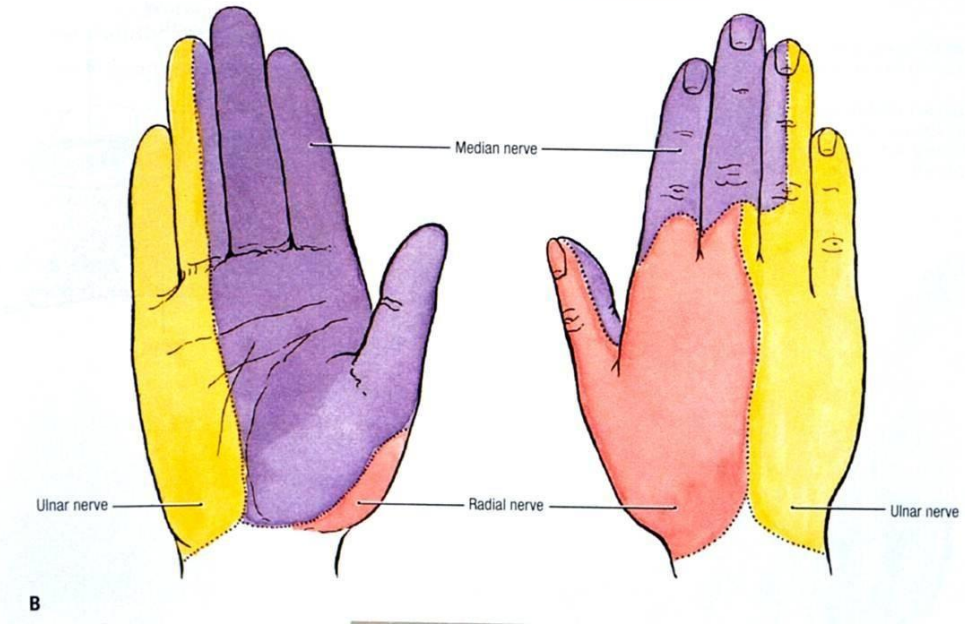
Treatment

- Injections
- Wrist splints at night
- Surgical Decompression

CTS Associations:

Obesity
DM
Rheumatoid Arthritis
Pregnancy/the Pill
♀>♂





Case

56♂ motorcyclist involved in a RTA and sustains a closed displaced transverse femoral shaft fracture. The fracture is treated by intramedullary nailing. The following day the patient becomes increasingly agitated and confused. On examination, he is pyrexial, hypoxic SaO_2 90% on 6 litres O_2, tachycardic and normotensive. Systemic examination demonstrates a non blanching petechial rash present over the torso. What is the most likely explanation for this?

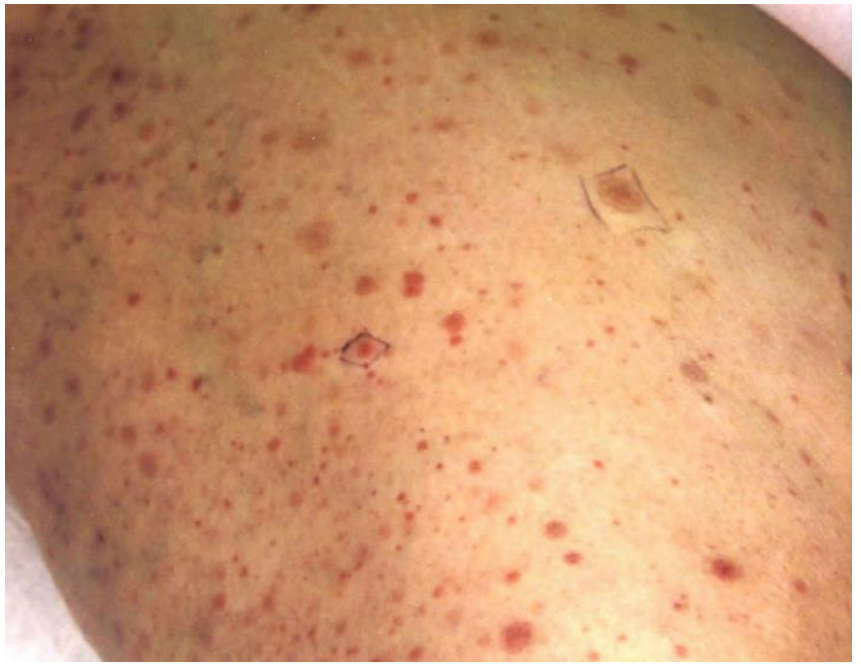
A. Pulmonary Embolism

B. Fat Embolism

C. Meningococcal Sepsis

D. Alcohol Withdrawal

E. Chronic Sub Dural Haemorrhage



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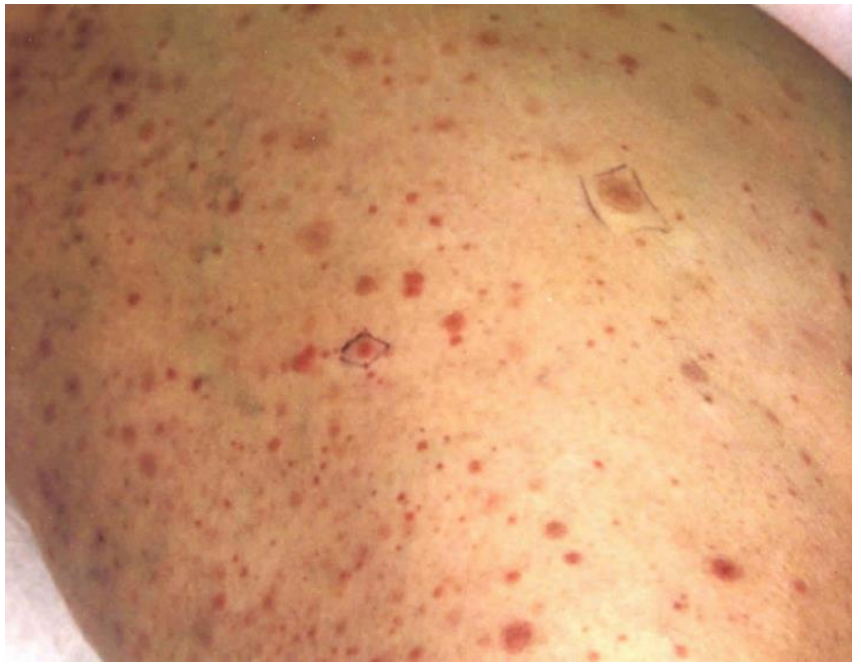

Complications of Fractures & Surgery

All of Surgery / Fractures:

- Blood loss / Vessel Damage
- Nerve Damage
- VTE
- Infection

Orthopaedics:

- Mal union
- Fixation Failure
- Fat embolus
- Dislocation

Acute

Intermediate

Long-Term

Fat Embolism

Triad of Symptoms
- Respiratory
- Dermatology
- Neurology

# of long bones

- ITU
- Manage shock
- Supportive Care
- Early surgery for #

Mortality 10-20%

System	Feature
Respiratory	• Early persistent tachycardia • Tachypnoea, dyspnoea, hypoxia usually 72 hours following injury • Pyrexia
Dermatological	• Red/ brown impalpable petechial rash (usually only in 25-50%) • Subconjunctival and oral haemorrhage/ petechiae
CNS	• Confusion and agitation • Retinal haemorrhages and intra-arterial fat globules on fundoscopy

Fat Embolism

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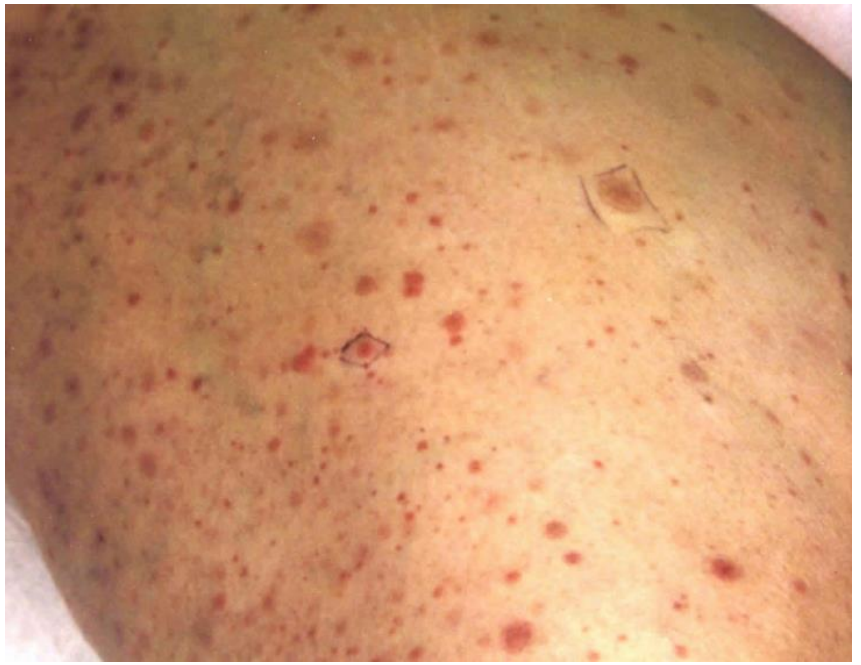


Lactate (Trauma)

- Aerobic metabolism -> Anaerobic metabolism

- Also used in Sepsis (BUFALO – Lactate of >2)

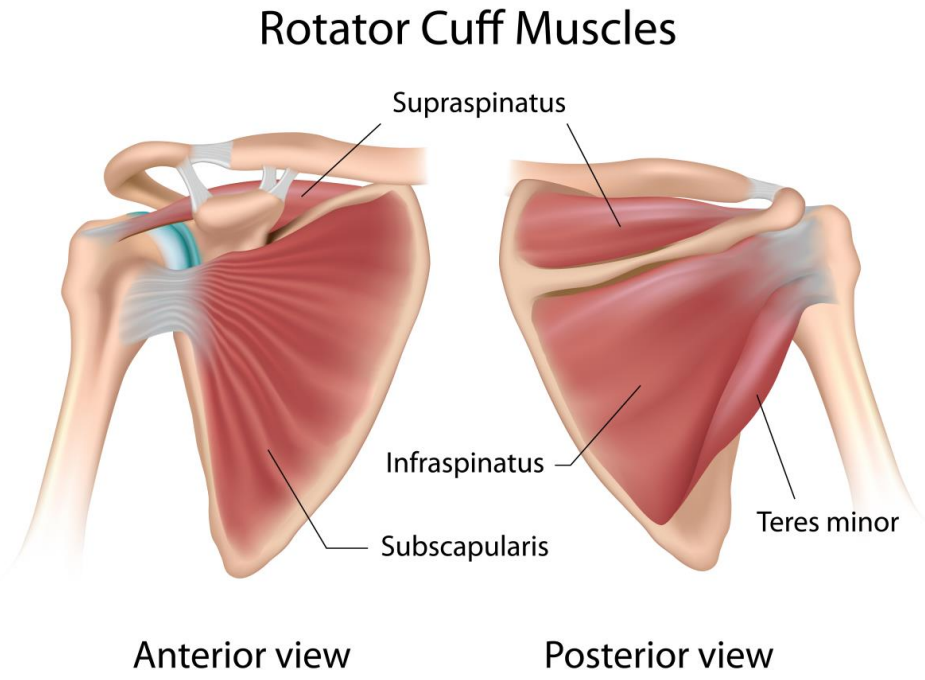
- Sepsis – “micro-perfusion”
- Hypoperfusion
- Marker of progression/deterioration

- VBG/ABG

Cases

45♂ presents to you at the GP practice with shoulder pain. You undertake a full shoulder examination. Which of the below muscles of the rotator cuff performs the action of Internal Rotation of the Humerus?

A. Supraspinatus
B. Infraspinatus
C. Subscapularis
D. Teres Minor



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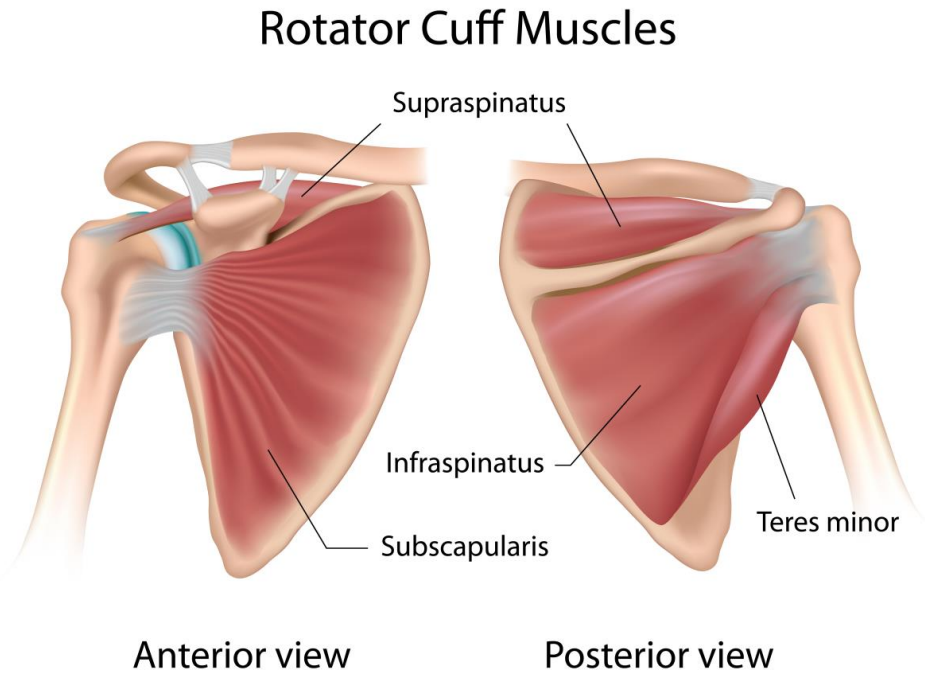
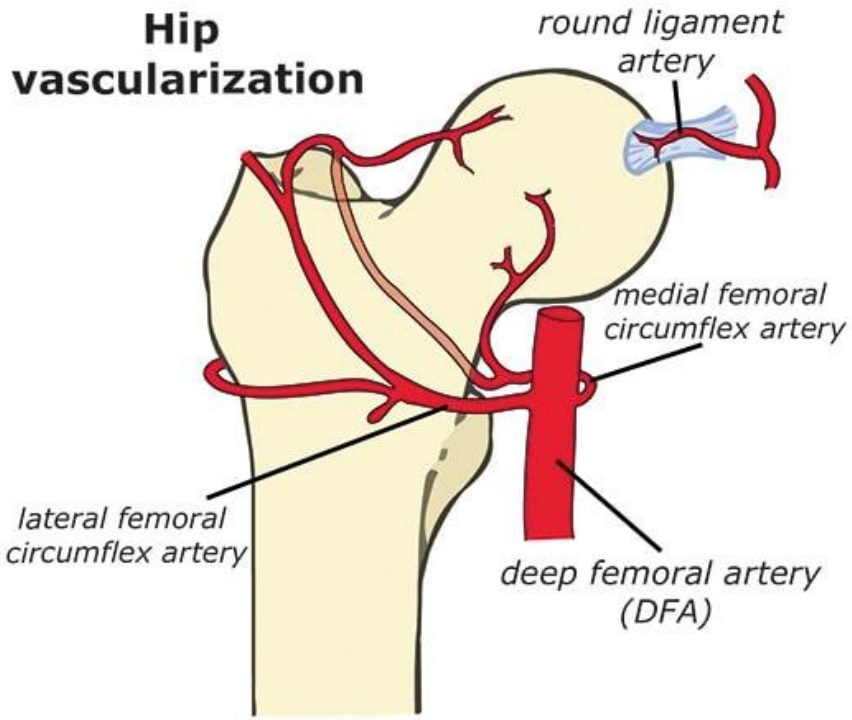


Cases

84👴 has a fall on the ward. She suffers a displaced intracapsular fracture of the neck of the femur. Which of these surgical options is most likely indicated?

A. Dynamic Hip Screw (DHS)
B. Femoral Nail
C. Intramedullary Nail
D. Hemi-Arthroplasty



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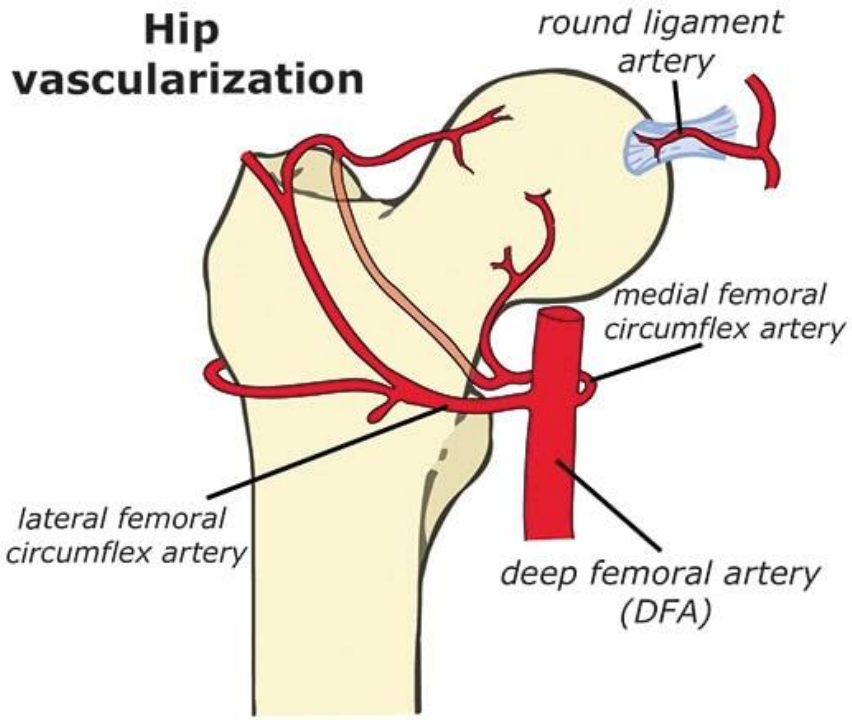

Cases

12👧 presents to A&E with a closed diaphyseal fracture of the radius. Her pain is adequately managed and a cast is made. Her mother asks you how long the bone should roughly take to heal?

You tell her:

A. About 3 weeks
B. About 6 weeks
C. About 12 weeks
D. About 24 weeks

<u>The "Best" Fracture</u>:

- **Child**
- **Upper Limb**
- **Closed**
- **Metaphyseal**

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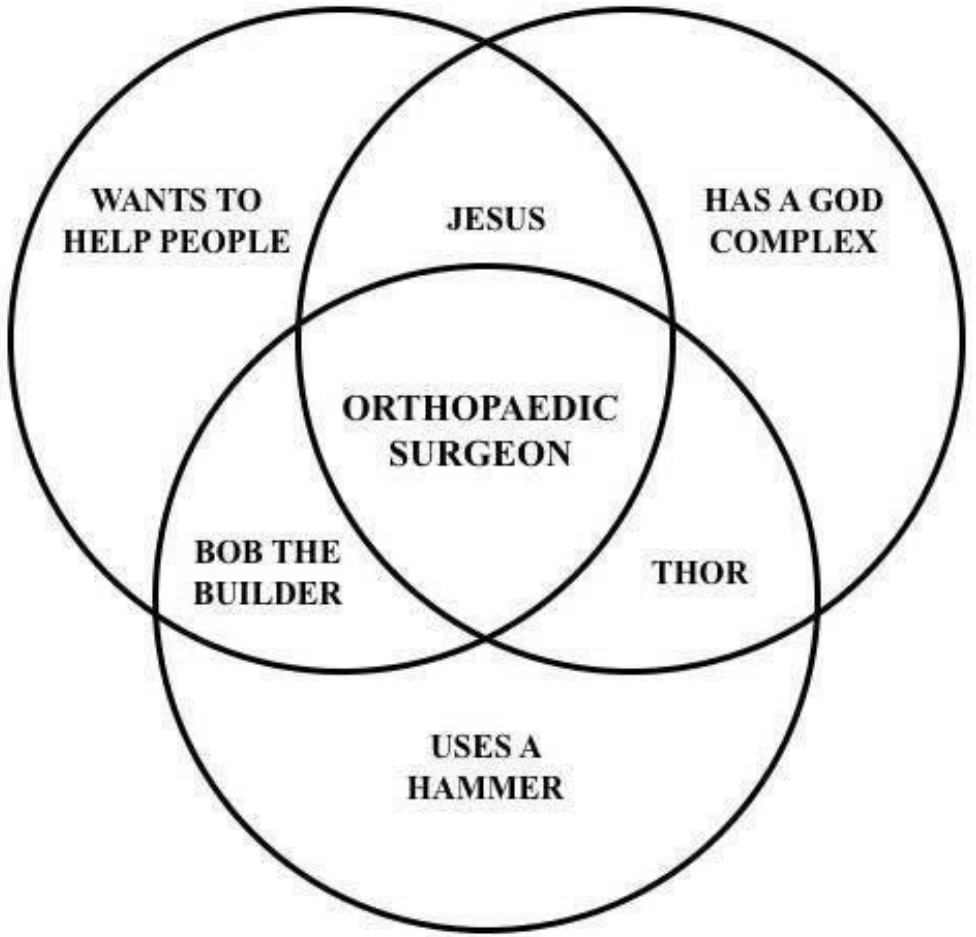
Good luck!


WANTS TO HELP PEOPLE
JESUS
HAS A GOD COMPLEX
ORTHOPAEDIC SURGEON
BOB THE BUILDER
THOR
USES A HAMMER

Not Covered:

- Neck Pathology
- Elbow Pathology – Tennis, Golfer’s, Students
- Hand – Dupytren’s, De Quervain’s
- Back – Kyphosis, Scoliosis
- Knee – ACL/PCL, Bursitis, Patella pathology
- Feet – “Flat feet”, Hallux Valgus, Pes cavus, Hammer/Claw/Mallet toes
- Other muscle tendinopathies/ruptures
- Osteomyelitis
- Arthritis
- Paeds/Congenital Ortho
- Bone Malignancies