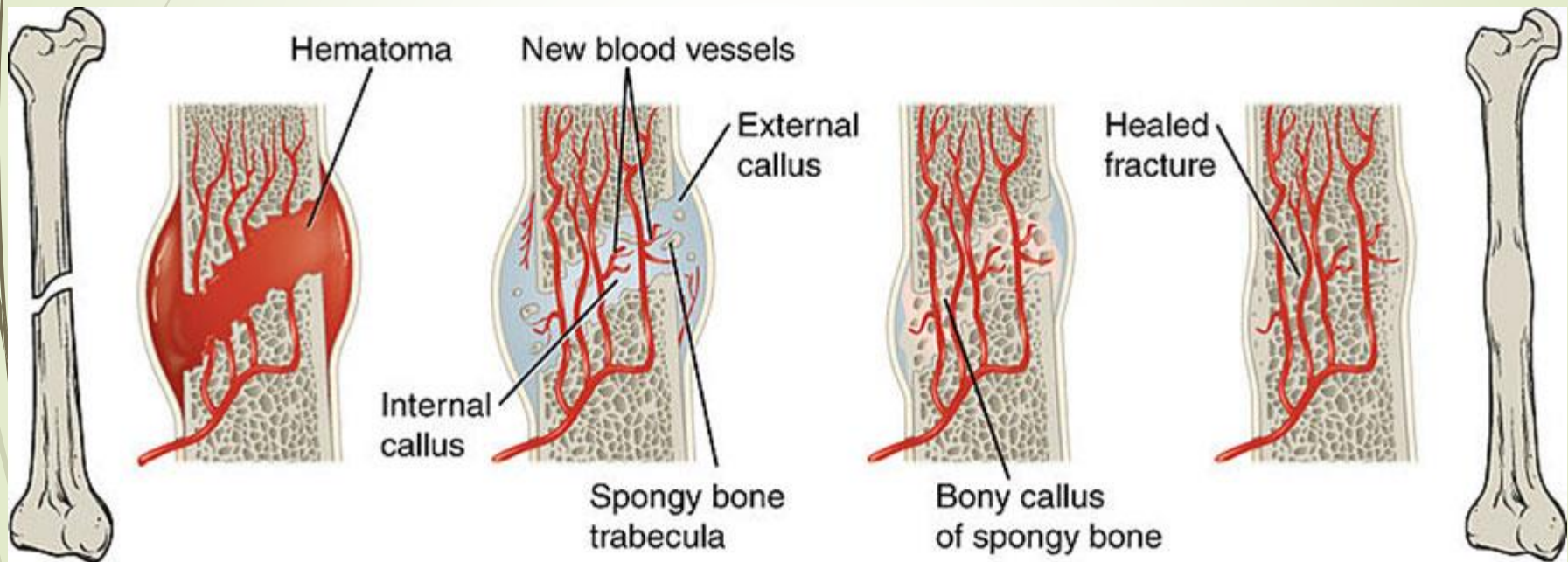




Bone Repair & Calcification

> WHAT BIOMEDICAL ENGINEERS NEED TO KNOW <

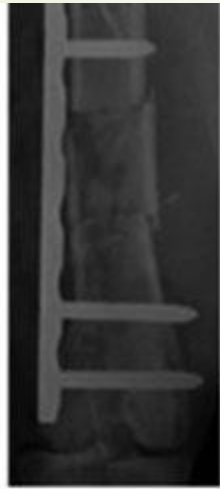
Phases of Fracture Healing



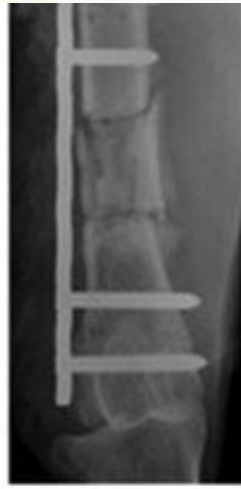
Healing Times & Calcification



postop 1



postop 2



2 weeks



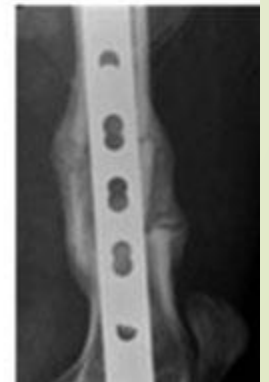
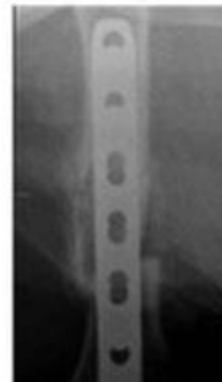
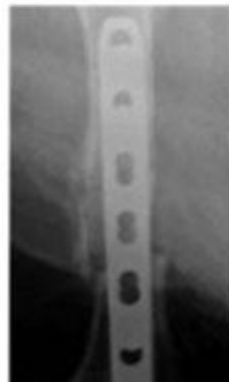
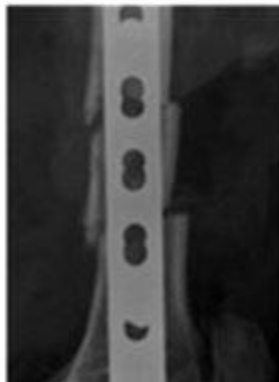
4 weeks



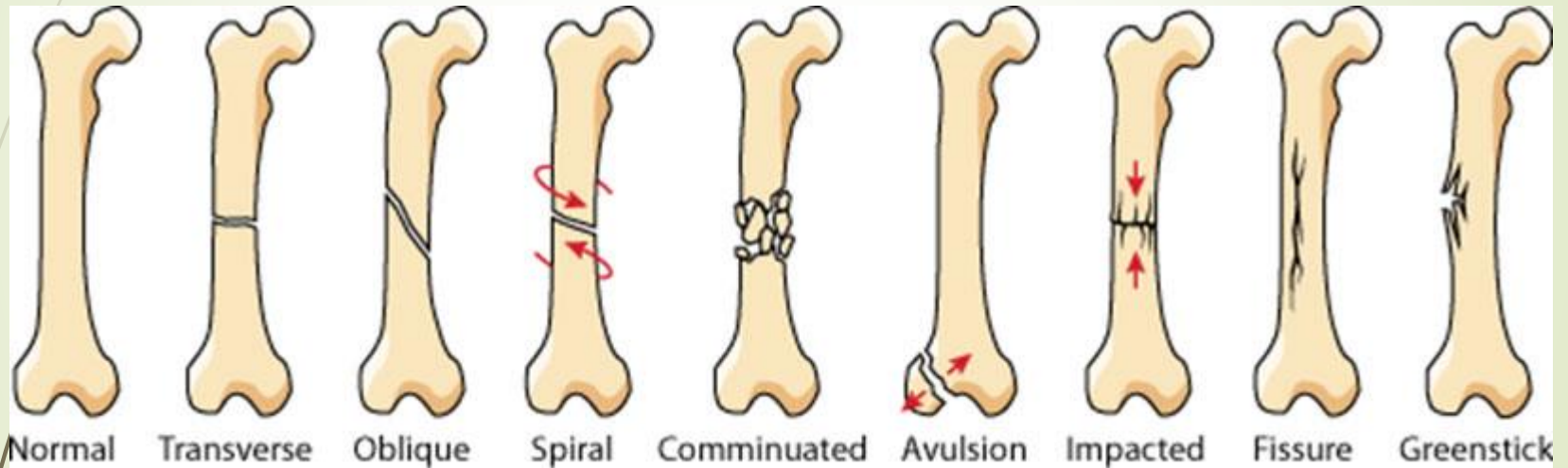
6 weeks



8 weeks



Bone Fracture Types



Transverse Fracture

A fracture straight across the bone, usually the result of sharp, direct blows or stress fractures caused by prolonged running.

The break occurs at a right angle to the bone's long axis.



Spiral Fracture

baseball
pitcher's
broken
arm →



A bone fracture caused by a twisting force.

Also called torsion fracture.



Impacted Bone



Compound/Open Fracture



Comminuted Fracture



Joint Fractures





Treatment Options

Fracture treatment depends on:

- **Location, fracture type and its characteristics**
- **The person's age**
- **The person's activity level**
- **Bone quality**

Nonsurgical Treatment Options



Surgical Treatment: External Fixation



Internal vs. External Fixation



Location of Fracture

- **Which bones are more likely to break?**

Ribs, wrists, fingers, toes, collarbones

- **Why are certain bones more likely to fracture?**

The body is designed to withstand forces.

Legs receive impact while walking and jumping.

Thus, leg bones require a significant amount of force to break.





How Does Treatment Depend on Location?

- **Certain treatments cannot be used on some fractures due to the location.**

For example:

- **Casts cannot be used on all parts of the body, such as moving joints.**
- **Finger or toes are often treated by using a nearby finger or toe as splint.**
- **The forces the body withstands at certain locations allows some treatments.**