

# Fracture Healing

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Traverse

Linear

Oblique  
non-displaced

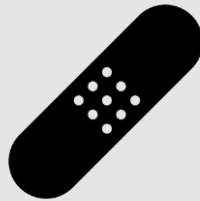
Oblique  
displaced

Spiral

Greenstick

Comminuted

# Learning Outcomes



To understand the principles of fracture healing

To understand the implication of management of the fracture related to the healing process.

To understand what affects healing and how therapy can influence public health and promote fracture healing.

To gain insight into why therapists at all levels benefit from understanding the fracture healing process.

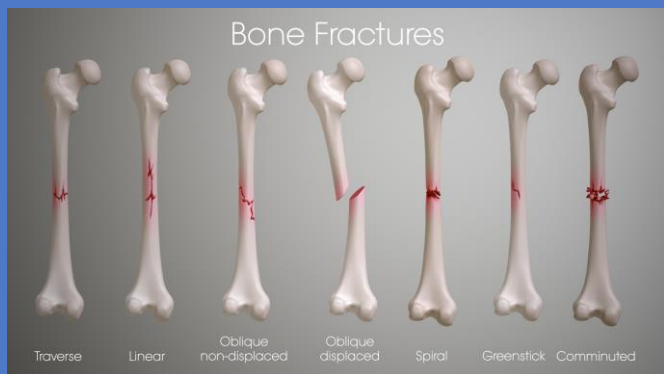
# What is a fracture



- ***A soft tissue injury that happens to have a broken bone associated with it.***
- Breach in continuity of bone, complete or incomplete caused by internal structure deficiency (pathological) or by external forces (traumatic)

# Types of Fracture

- Greenstick – children
- Compression
- Multi-fragmented - complex
- Butterfly fragment – shard separate to the rest of the bone
- Open/closed
- Transverse
- Spiral
- Stress – related to microdamage eg; shin splints.
- Pathological – related to disease eg: osteoporosis/cancer



How does  
a bone  
heal?



Two main  
classifications:

- Primary/Direct
- Secondary/Indirect

This decides the fixation

# Indirect/ Secondary Healing



## Five stages:

1: Bleeding/Hematoma

2: Inflammation – essentially brings in cells.

3: Proliferation – osteoblasts and clasts do their stuff

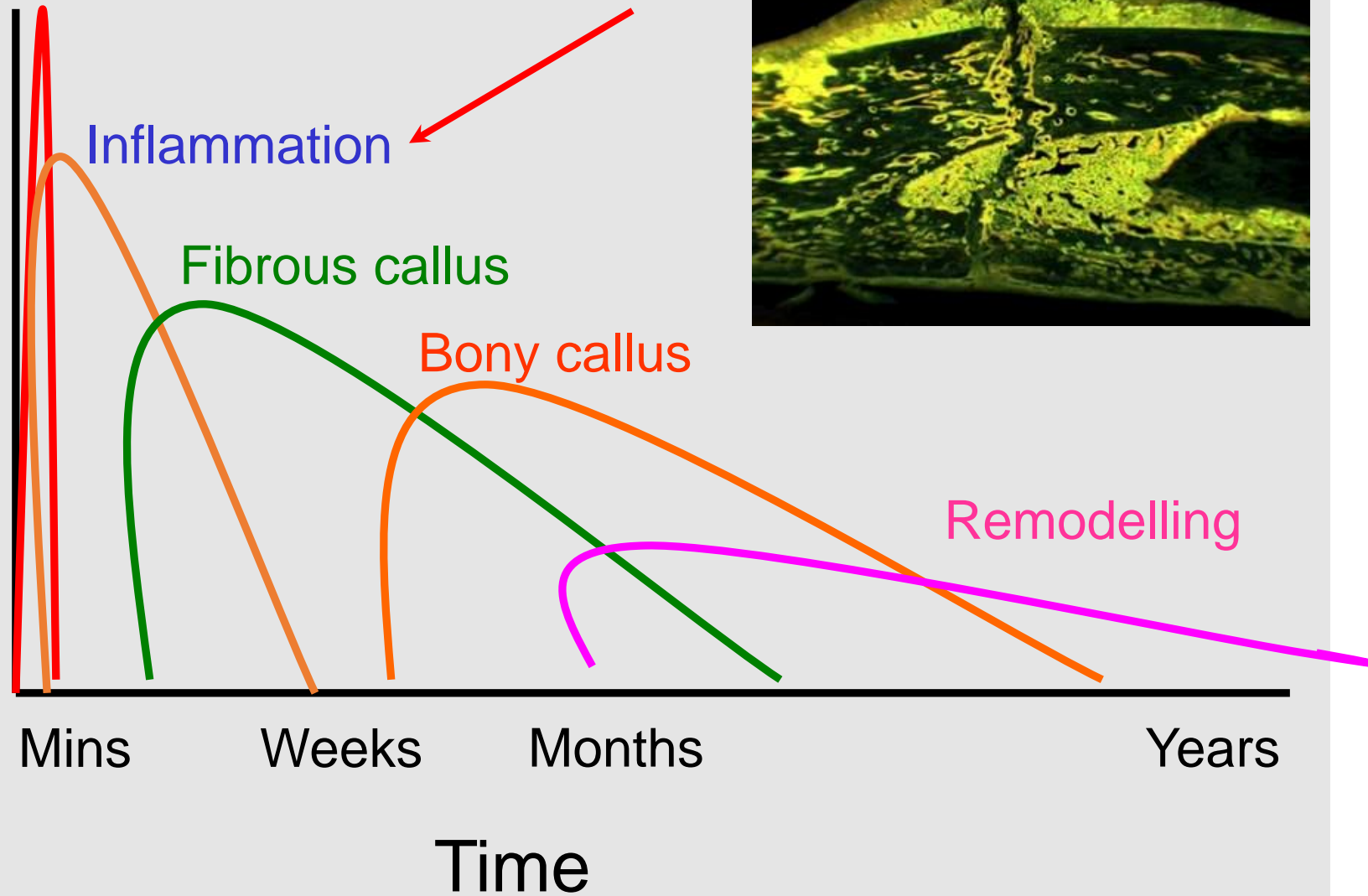
4: Consolidation – cartilage forms and adapts

5: Remodelling – relates to the strain and load on the bone

# Indirect/ Secondary Healing

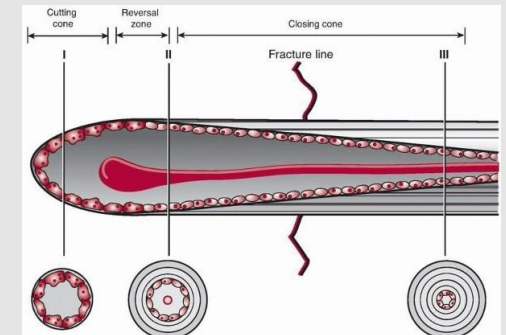
Haematoma

No NSAIDS



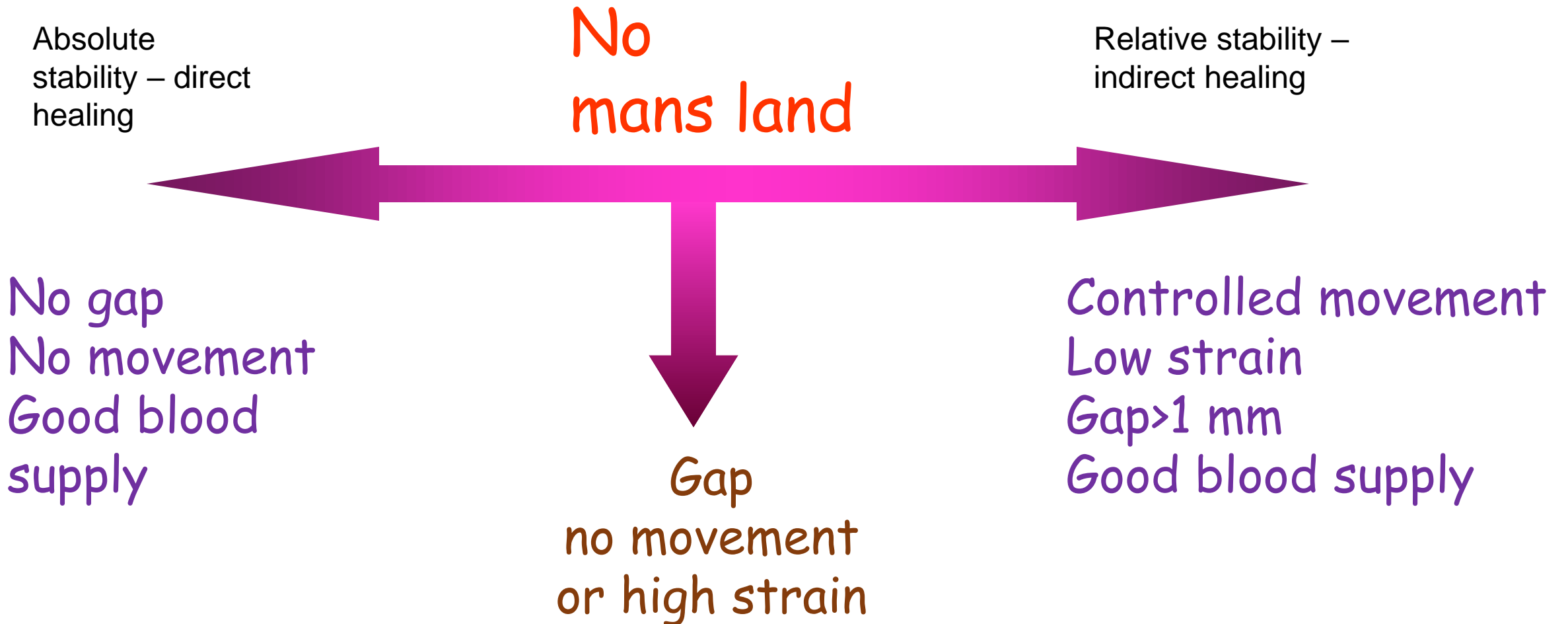
# Direct/Primary Healing

- The body naturally repairs normal every day micro damage to the bone.
- This way of healing tricks the body into thinking the damage is a result of natural micro damage.
- Uses bodies natural process to heal the bone.
- [THE BIOLOGY OF FRACTURE HEALING - PMC \(nih.gov\)](https://www.nih.gov)





# The fixation will not work if.....:



# Classification vs Healing Types

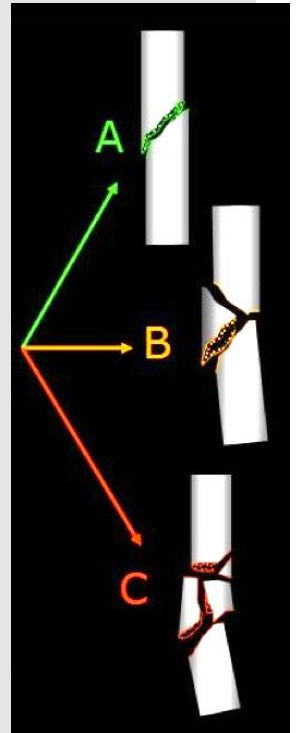


The type of fracture, gives a suggestion to what type of healing is required to get the best result and therefore the fixation method needed.

A: Direct healing - simple

B: Direct/Indirect healing - butterfly

C: Indirect healing – multi-fragmented



# Types of Fixation

1. Screws
2. Plates
3. IM nails
4. Locking screws
5. Ex-Fix
6. Casts



# What Can Delay Healing

**MALNUTRITION** – reduced activity and proliferation

**SMOKING** – inhibits osteoclasts/vasoconstriction

**DIBETES MELLITUS** – decrease collagen content/defective cross linking

**EXTENSIVE SOFT TISSUE INJURY** – swelling, disrupt, balance between osteoblasts/clasts.

**INTERRUPTION TO BLOOD SUPPLY** - osteoclasts/blasts cannot get to area.

**INADEQUATE REDUCTION/STABILISATION**

# Why Bother?



Fixation



Pain



Movement



Weight bearing  
status



Exercises – why  
some and not  
others



General Health



Overall  
empathy with  
the patient's  
journey.



# Your Role?



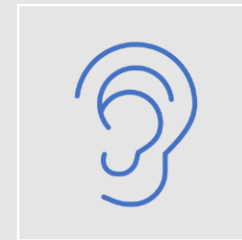
Mobility Assessment



Education



Exercises



Empathy

Thank you



Questions