UNDERSTANDING FRACTURES

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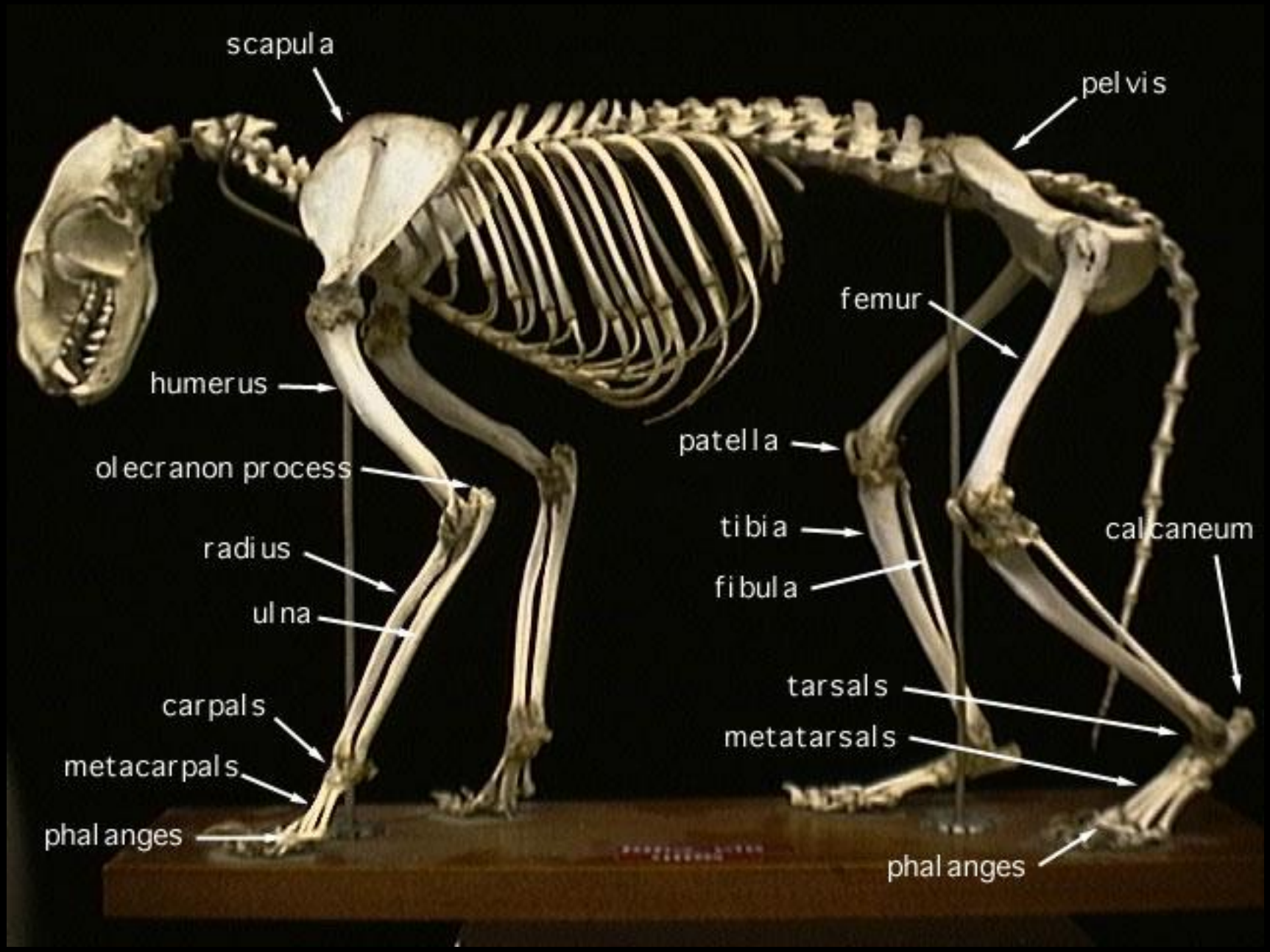
BASIC MAMMAL ANATOMY


scapula
pelvis
femur
humerus
patella
olecranon process
tibia
calcaneum
radius
fibula
ulna
tarsals
carpals
metatarsals
metacarpals
phalanges
phalanges


"Becky" the Raccoon

TYPES OF FRACTURES...

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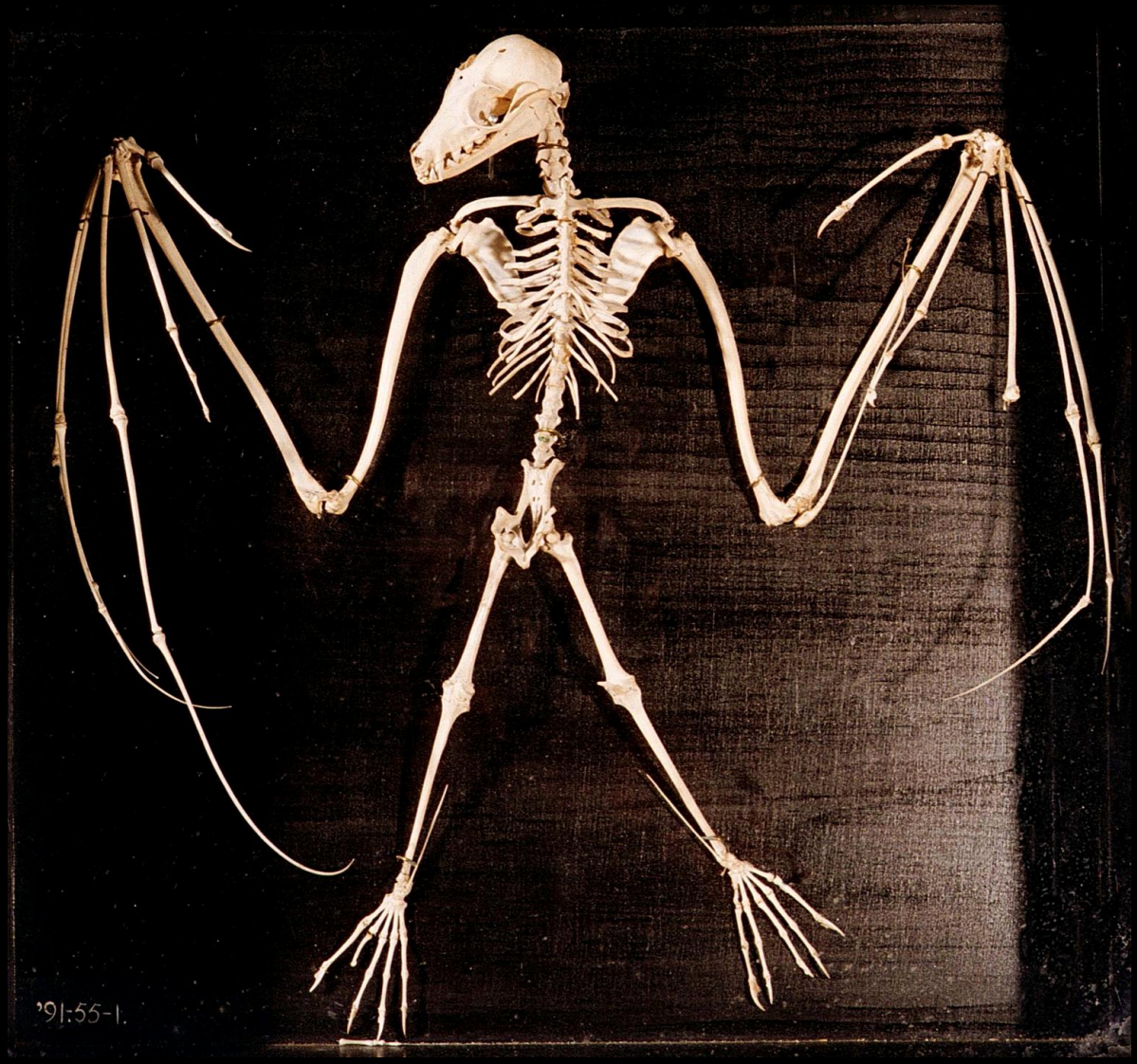


TYPES OF FRACTURES

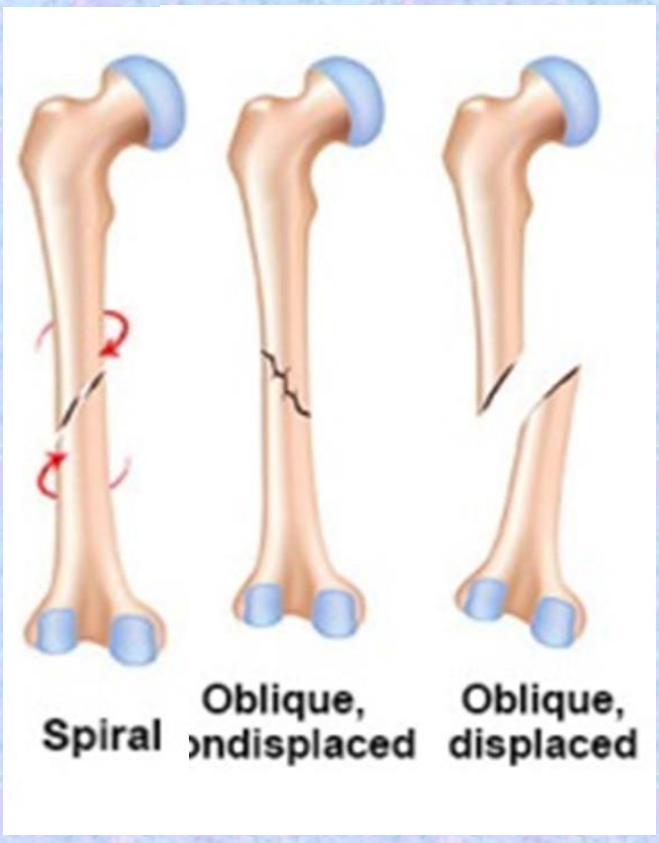
TRANSVERSE - the break is in a straight line across the bone.

GREENSTICK - incomplete fracture. The broken bone is not completely separated.

TYPES OF FRACTURES

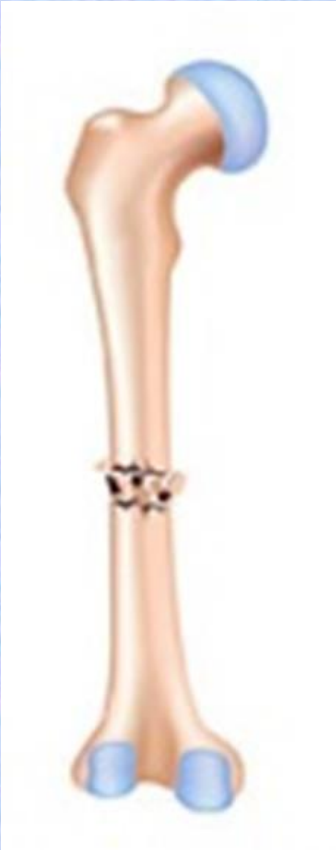
SPIRAL - the break spirals around the bone; common in a twisting injury..

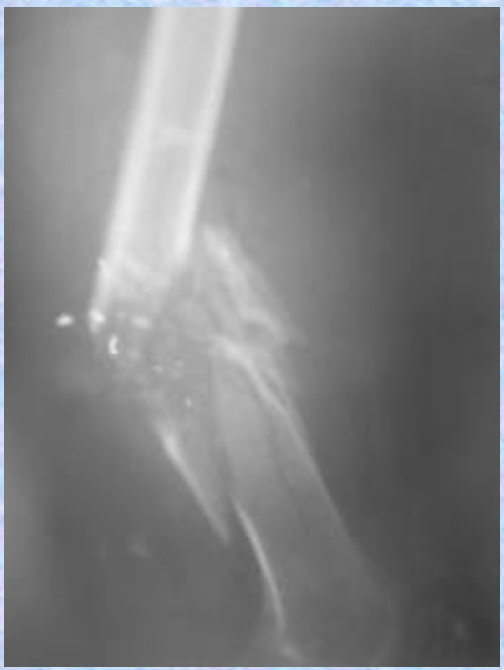
OBLIQUE - diagonal break across the bone.

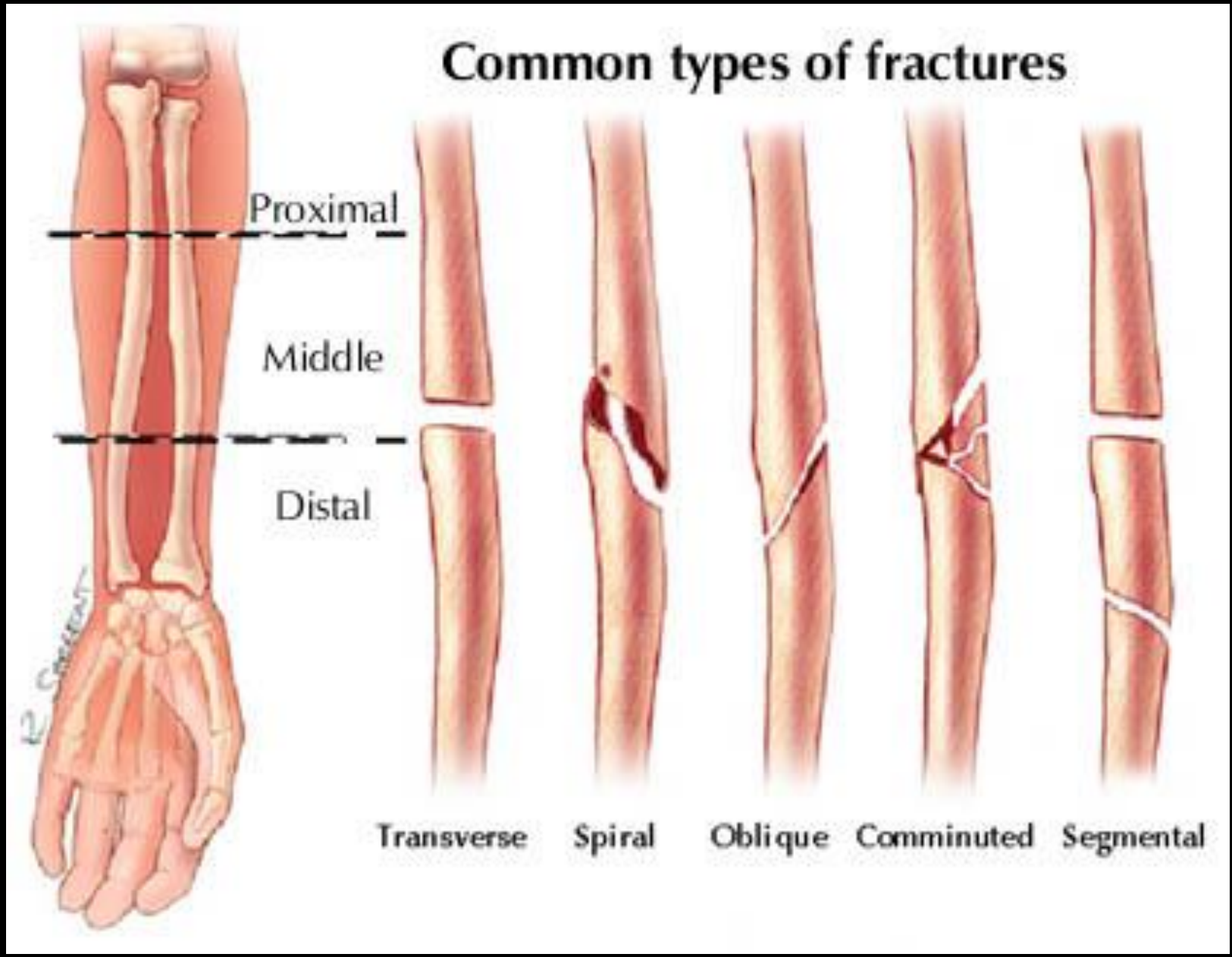


TYPES OF FRACTURES

COMMINUTED – multiple breaks, smashing injury

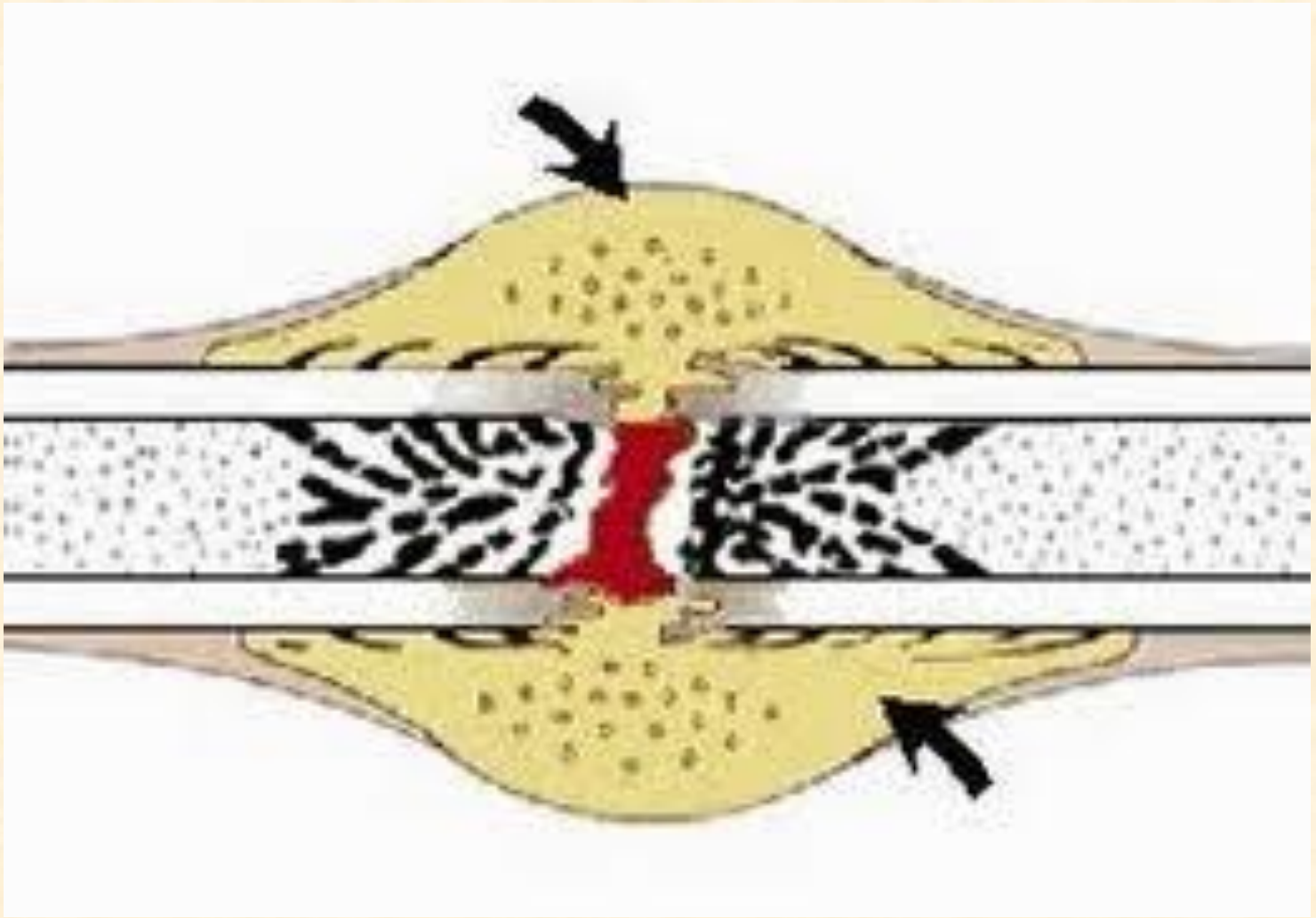





Common types of fractures
Proximal
Middle
Distal
Transverse
Spiral
Oblique
Comminuted
Segmental

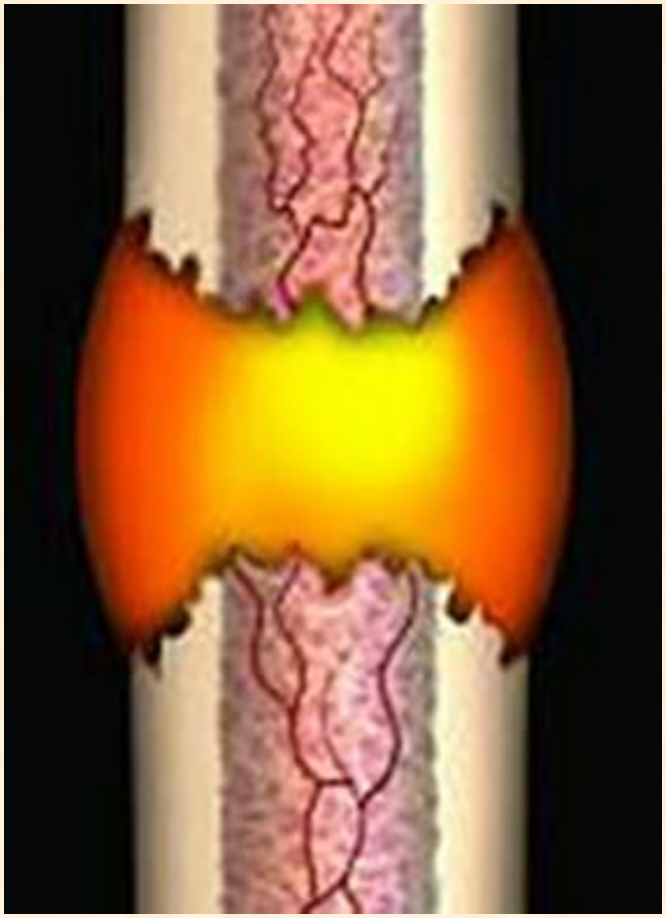
Types of Bone Fractures

How do bones heal?



1. The Inflammation Stage

- Begins the moment the bone is broken
- Massive disruption to the blood vessels results in immediate swelling and bruising in the area of the broken bone
- Hematoma and blood clots cover the bone ends and softly stabilize the bone
- As the clot breaks down it releases chemicals that start to lay down fibrin to form new bone



SOFT CALLUS FORMATION

- The chemical and metabolic reactions that produce the Soft Callus begin a few days after the bone is broken. Fibroblast cells that are present in the Granulation tissue begin to form Cartilage and Fibrocartilage.

SOFT CALLUS FORMATION

- This Soft Callus provides sufficient stability at the fracture site for new blood vessels to begin forming and for Osteoblasts at the Periosteum (the outer surface of the bone) to begin laying down the new bone, known as a ‘callus’

HARD CALLUS FORMATION

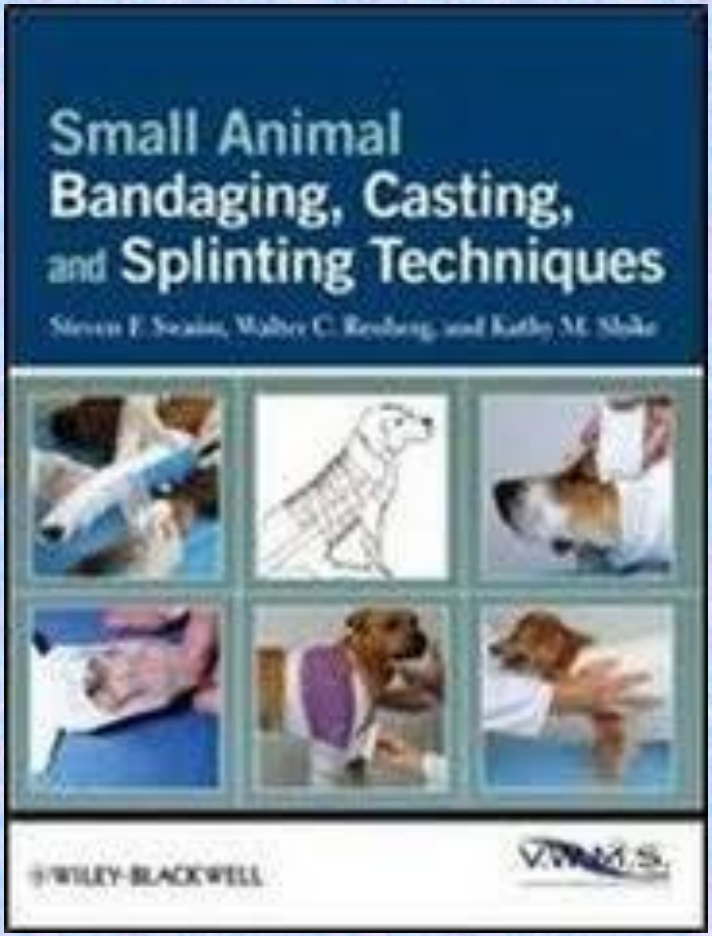
- The fragile cartilage material of the Soft Callus is transformed completely new bone. This process *typically* continues for up to 6 weeks, depending on the type and stability of fracture.

- Hard Callus formation is guided by the release of mineral compounds such as Calcium and Phosphate into the Cartilage tissue, which subsequently transforms into a bridge of Hard Callus over the fracture site.

BONE REMODELING

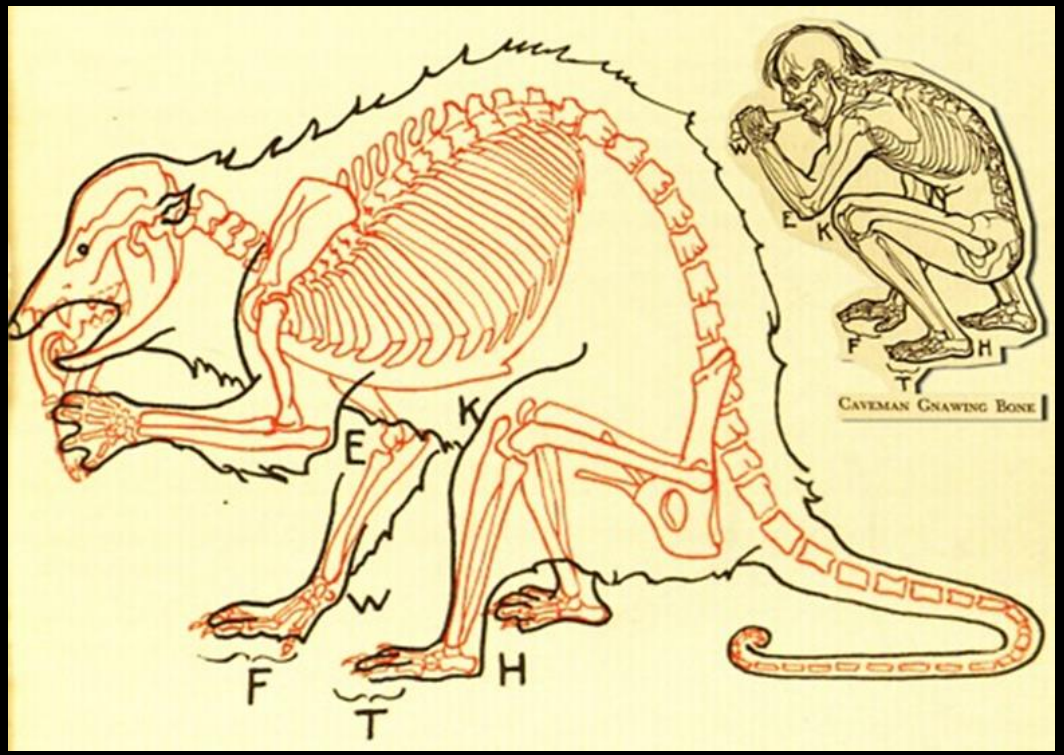
- Over time, the normal shape of the bone is restored.
- Bone is laid down where it is needed by depending on the stresses that are placed on the bone during every day.
- Remodeling continues over time.

Working with Fractures

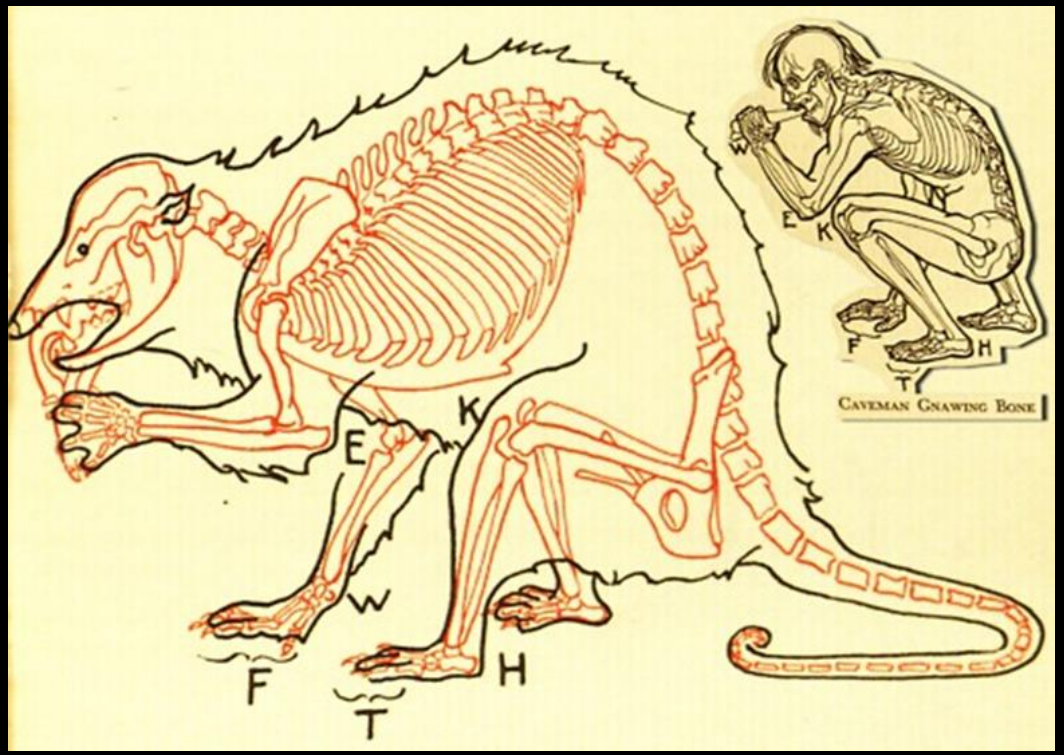


- KNOW the anatomy
- Fracture immobilization is an art
- Work with your vet
- Establish guidelines for pain management
- Know which fractures will require surgery

Anatomical adaptations have the same rules.....



FOR IMMOBILIZATION



Purpose of Fracture Immobilization

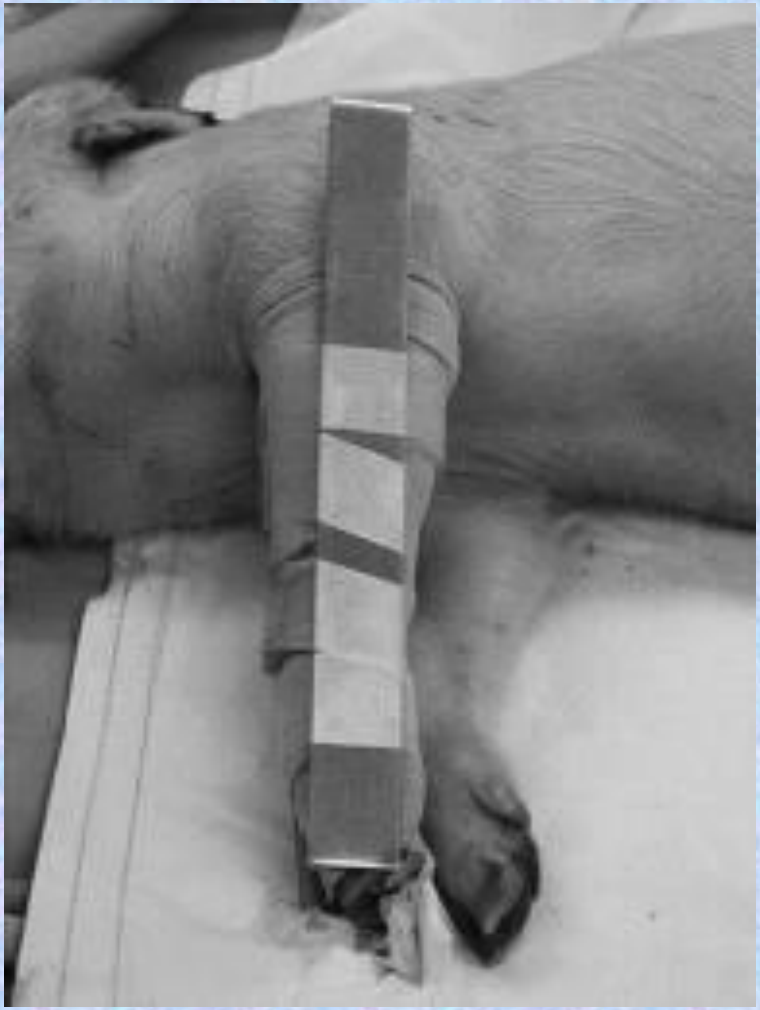
- Minimize the risk of soft tissue damage from movement of bone ends.
- Maintain bone alignment until fracture heals and bone integrity is restored.
- Provide stability until or after surgical repair is done.

Rules for Fracture Immobilization

- Must stabilize the joint above and below the fracture site
- Address wounds
  - Disinfect and cover properly
  - Use non-adherant dressing
  - Check often
- Wrap toward the heart
- Check wraps often
- Tip of extremity should be visible whenever possible

IMMOBIZATION

- Should be done immediately
- Will minimize further damage
- Should be checked by someone experienced within 24 hours



IMMOBIZATION

MODIFIED ROBERT JONES

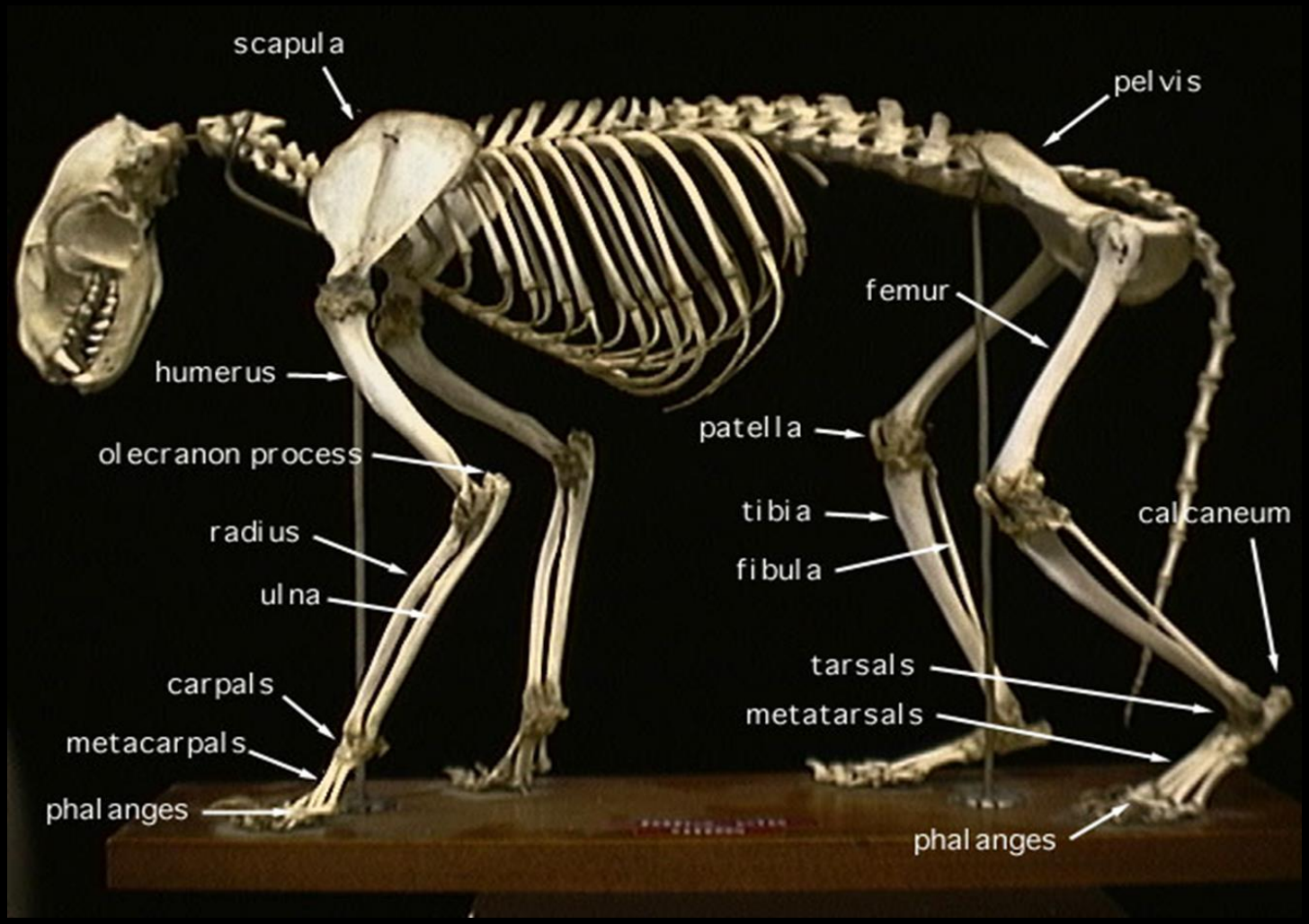
IMMOBIZATION

MODIFIED ROBERT JONES

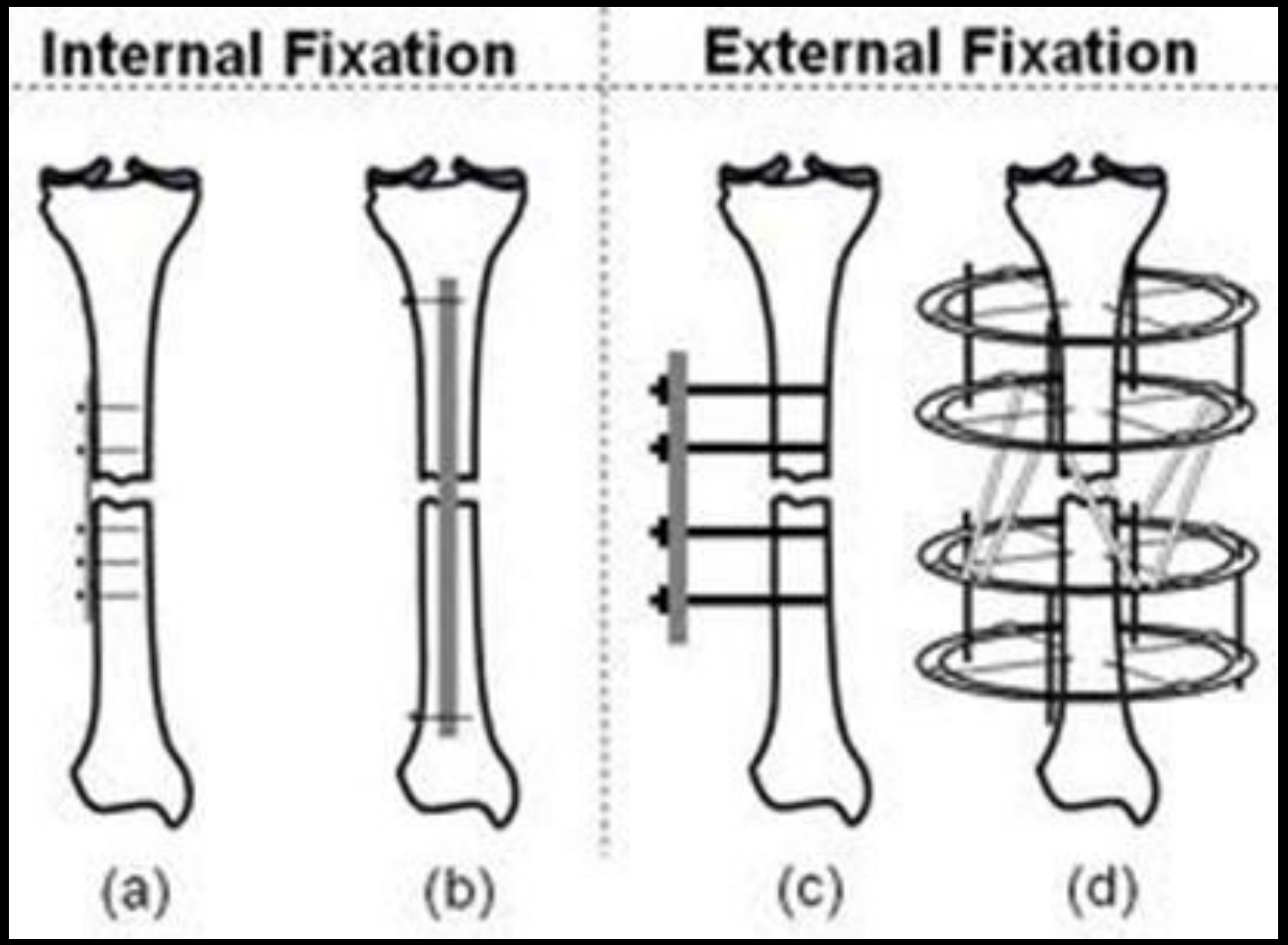
Applying a Splint


VETERINARY
SAM
SPLINT
36 INCH

SOME FRACTURES NEED SURGERY



Some fractures need surgery



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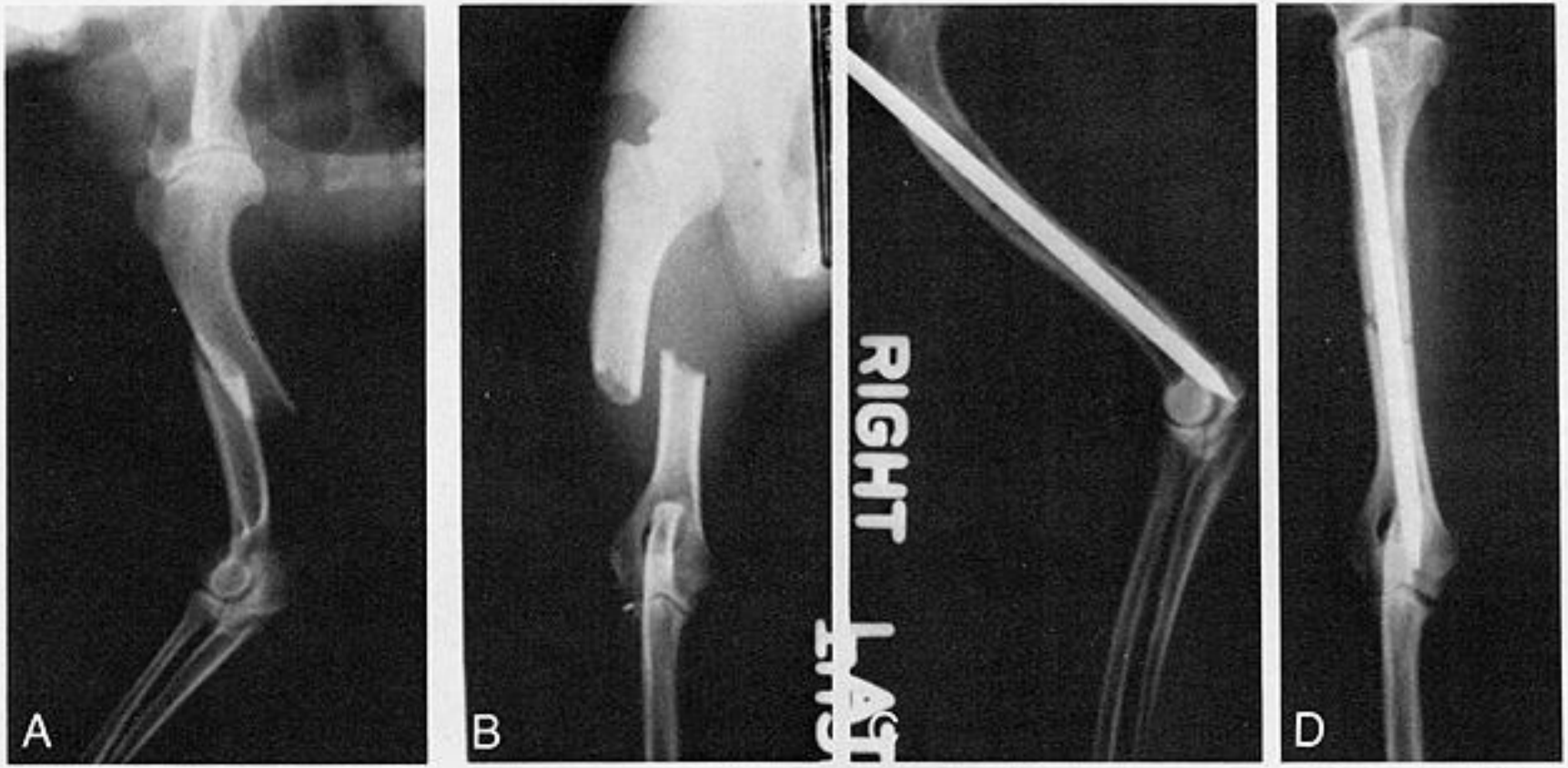

FIG. 22-3 A transverse midshaft fracture of the humerus (*A*,*B*) was stabilized with an intramedullary pin (*C*,*D*).

IN SUMMARY…

- Many common fractures can be addressed non-surgically, but require skill
- Practice bandaging
- Practice palpation
- Work with your veterinarian if you are going to rehabilitate these patients!

QUESTIONS