

What are the functions of bones?

1. support and protection
2. movement
3. a Ca^{2+} (and PO_4^{3-}) store
4. a bone marrow store

what are the components of the bone's matrix?

1. type 1 collagen fibres (~90-95%)
2. some proteoglycans (~5%)

what is the main function of collagen?

provides the tensile strength

what is the main function of proteoglycans?

provide the compressive strength

what are the two types of bones?

1. Compact bone (aka cortical bone) → dense, stiff structure
2. Trabecular bone (aka cancellous or spongy bone) → spongy, light structure

What is the porosity of the compact bone?

low porosity (5-25%)

What is the porosity of the trabecular bone?

high porosity (up to 70%)

where can u find cortical and trabecular bone?

In long bones cortical bone forms the shaft → diaphysis

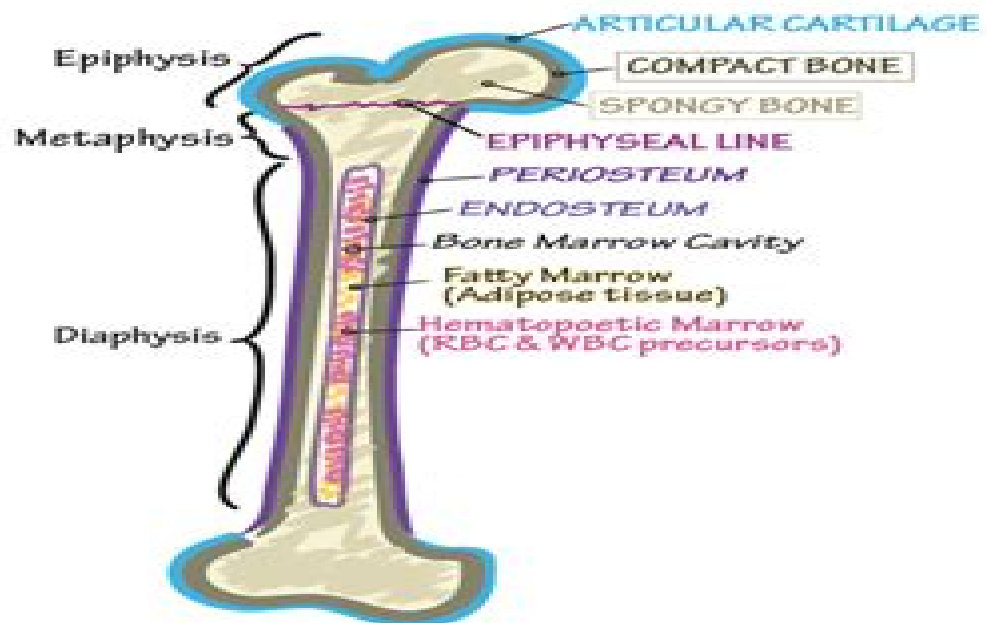
Trabecular bone is found at the ends → epiphysis/metaphysis

What is between the epiphysis and the metaphysis?

the epiphyseal growth plate

how does the growth of the long bones occur?

Growth of the long bones occur at the growth plate until ~18 when it fuses with the metaphysis

**What is ossification?**

During fetal life, bones are modelled in cartilage (type 1 collagen) and then mineralized / the natural process of bone formation.

What controls the cartilage proliferation at the growth plate and elongation of the bones?

1. growth hormone
2. insulin-like growth hormone (IGF-1)

what happens once growth plate fuses?

cartilage proliferation and elongation stop
vascularisation and ossification of the bone start

what is the unit of bone growth?

the osteon

what is an osteon?

a series of concentric circles of collagen deposition around a blood vessel

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Christian G. Meyer



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