

# SKELETAL SYSTEM: INTRODUCTION

15 September 2016

fr. S&M p 109-, Martini's 5<sup>th</sup>: p183-192, Martini's 7<sup>th</sup>: 180-201 ,8<sup>th</sup>: 185-194, 9<sup>th</sup>: 169-196  
Martini 10<sup>th</sup>: 179-205

Skeleton has 206 individual bones

Bones are living structures, capable of growth, adaptation and repair.

## Functions:

support  
movement/leverage  
protection  
mineral reservoir  
hematopoiesis

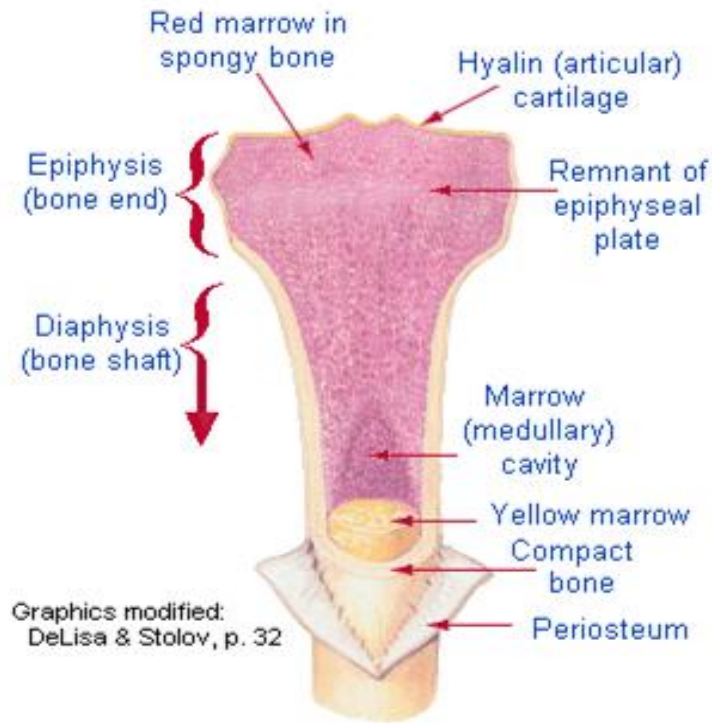
## Example:

vertebral column  
humerus to ulna  
calvarium of skull  
Calcium storage  
Red marrow creates blood

## Types of bones:

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long	humerus, tibia, etc
short	carpals of wrist
flat	parietal of skull
irregular	vertebra, facial bones



## Bone anatomy:

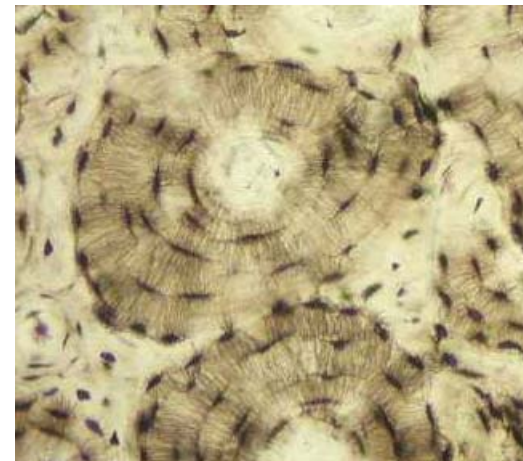
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<b>diaphysis</b>	[across, to grow]	shaft
<b>epiphysis</b>	[upon, to grow]	end portion of bone
<b>periosteum</b>	[around, bone]	dense irregular C.T., capsule-like
<b>compact bone</b>		outer portion, very strong
<b>endosteum</b>	[inside, bone]	connective tissue lines inside compact bone
<b>medullary cavity</b>	[middle]	hollow center, filled with yellow marrow (see next)
<b>yellow bone marrow</b>		fat storage
<b>cancellous</b>	[cancel: lattice]	also called spongy bone, (see next)
<b>red marrow</b>		Site of <b>hematopoiesis</b> [blood; creation]
<b>epiphyseal cartilage</b>	(or line)	site of 2° ossificat'n (elongation)
<b>diploe</b>	[double in Gk]	cancellous bone

## Microscopic anatomy:

page 185, 186 (like layers (lamellae) of an onion

<b>Haversian system</b>	also <b>Osteon</b> [bone; unit]: Unit of structure
<b>Haversian canal</b>	central canal, carries blood vessel
<b>lamellae</b>	[layers] concentric rings of bone around central canal
<b>lacunae</b>	[pool] chambers in which osteocytes reside, define lamellae
<b>osteocyte</b>	[bone cell]
<b>canaliculi</b>	osteocyte protoplasmic extensions, maintain bone



Blood reaches by **Volkman's canals** from periosteum or marrow.

Cancellous bone is not in concentric rings, rather **in line of stress**.

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## Composition:

Cells: osteocytes  
Matrix:  
Fibers: collagen fibers  
ground substance: **hydroxyapatite**:  $3Ca_3(PO_4)_2 \cdot Ca(OH)_2$   
Similar in strength to reinforced concrete:  
Strong but not brittle because of collagen

