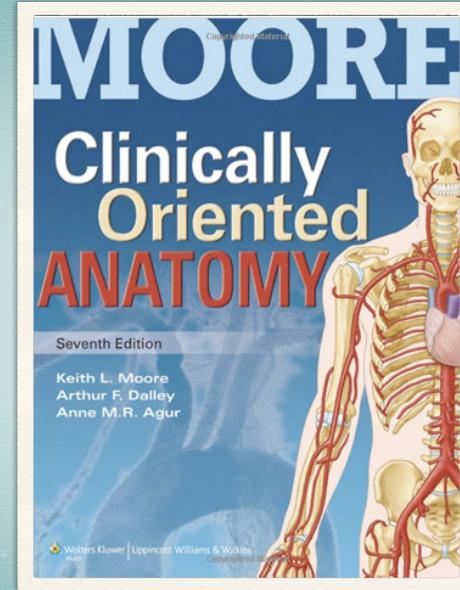


# KEMİKLER HAKKINDA GENEL BİLGİLER

Dr. Selçuk TUNALI  
TOBB ETÜ, 25 Eylül 2014

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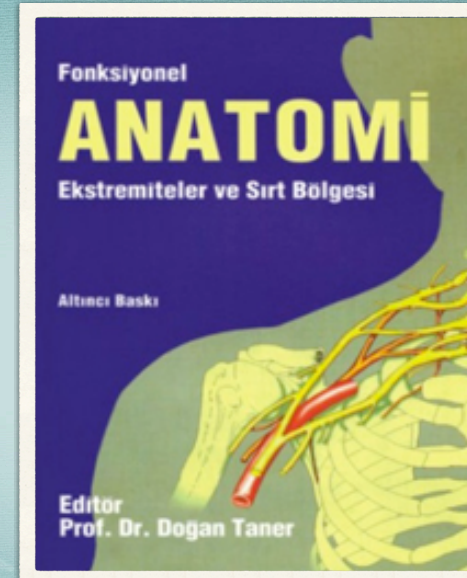
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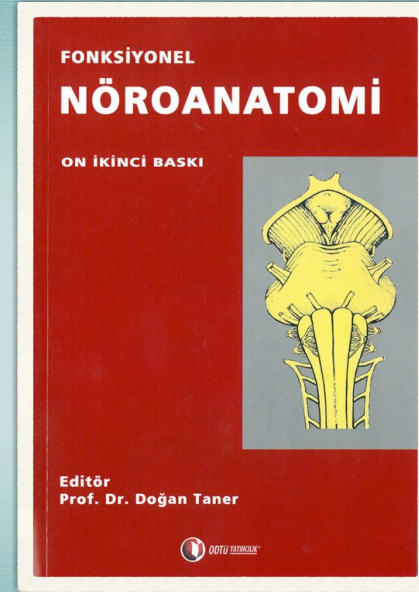
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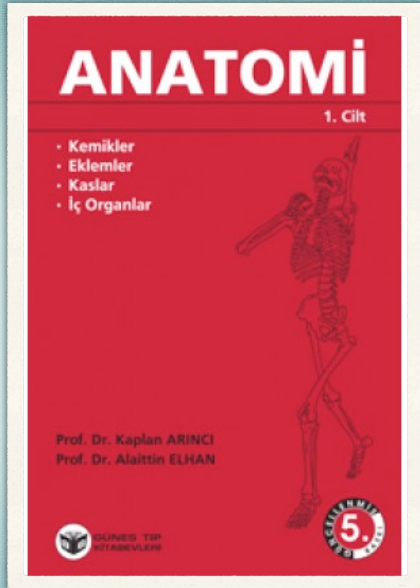
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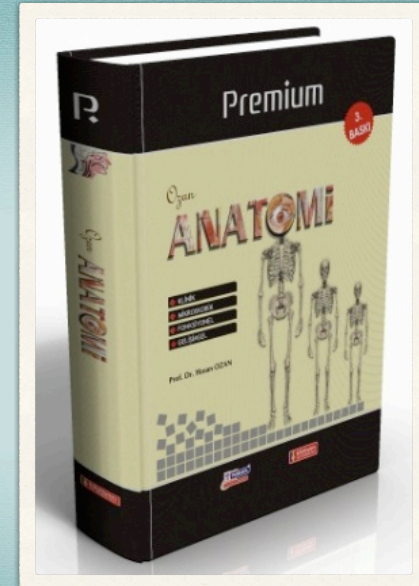
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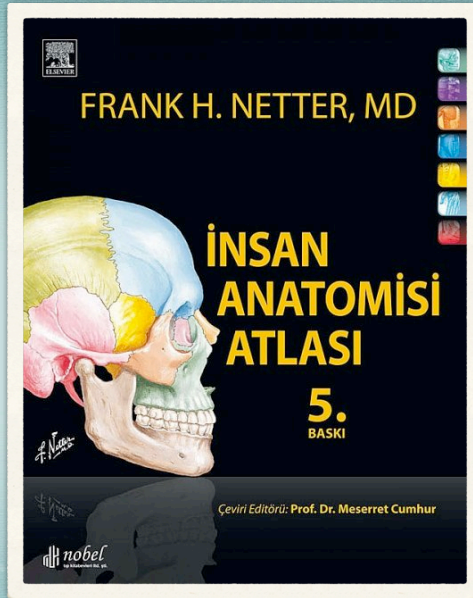
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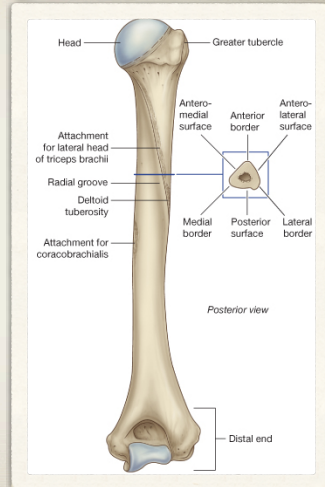


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## Osteoloji

- \* İskelet ve kemik yapıların
- \* Yapısı
- \* Fonksiyonları
- \* *osteo* – kemik
- \* *loji* – bilim

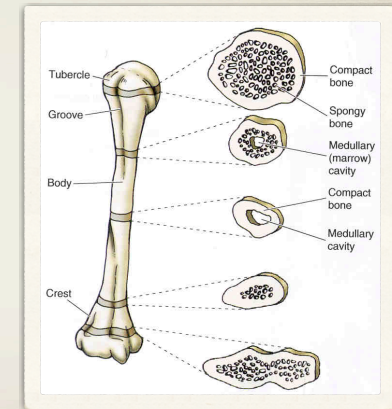


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## Kemiklerin Fonksiyonları

- \* Vücuttaki en önemli destek dokusu
- \* Vital yapıların korunması
- \* Hareketin mekanik temeli
- \* Mineral deposu
- \* Kan hücresi üretimi



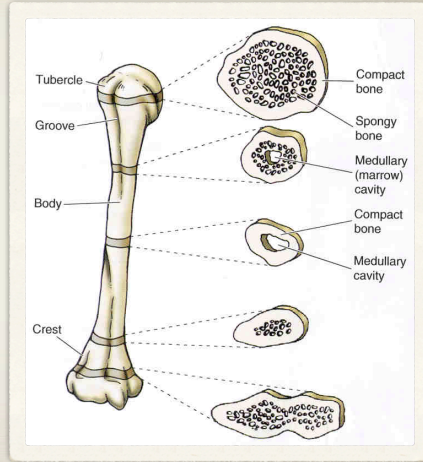
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# Kemikler

- \* Kompakt kemik
- \* Süngerimsi kemik
- \* Cavity medullaris
- \* Kemik iliği (medulla osseum)
- \* Kırmızı (medulla osseum rubra)
- \* Sarı (medulla osseum flava)



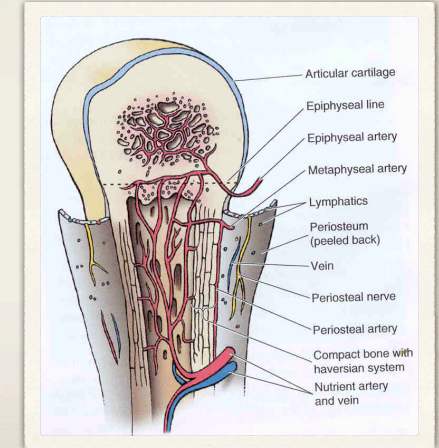
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# Periosteum

- \* Tüm kemiklerin dış yüzeyini örten membran
- \* İzolasyon & koruma
- \* Kan ve sinir iletim yolu
- \* Kemik büyümesi ve tamiri
- \* Kemikleri çevre bağ dokusuna bağlar



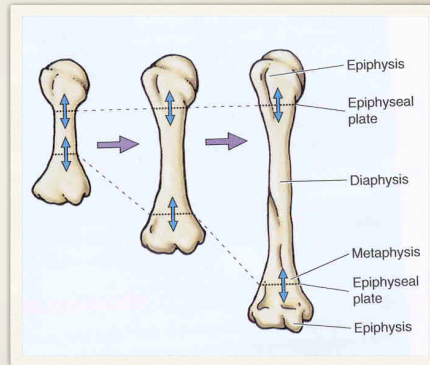
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# Kemikleşme

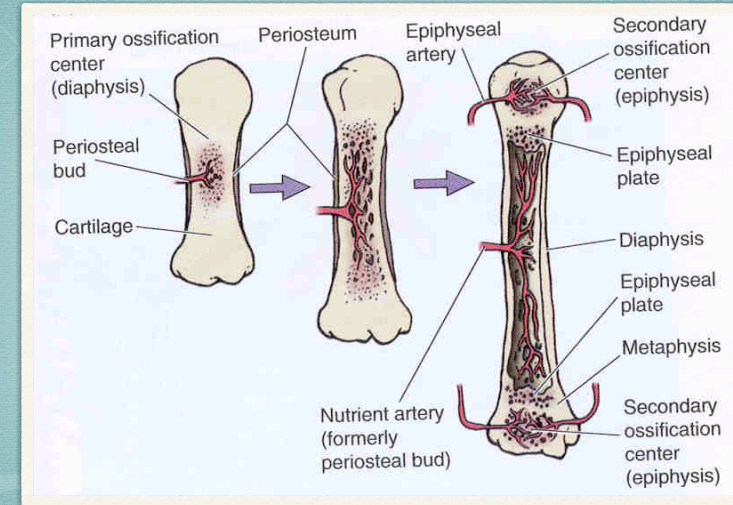
- \* Ossifikasyon
- \* Intramembranöz
- \* Enkondral (intrakartilaginöz)
- \* Primer ossifikasyon merkezi (diafiz)
- \* Sekonder ossifikasyon merkezleri (epifiz)
- \* Epifiz kıkırdağı (cartilago epiphysialis)



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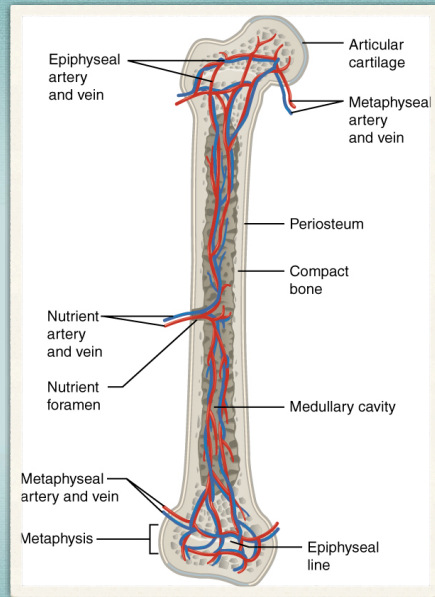


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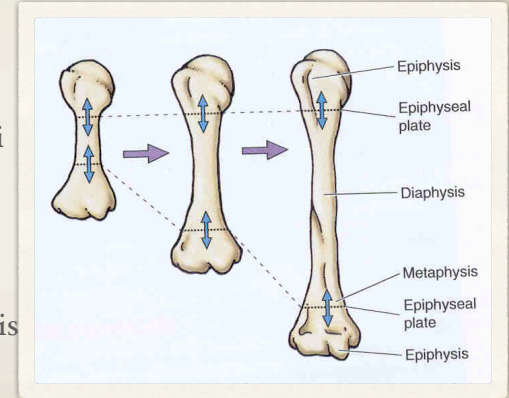
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# Kemik Büyümesi

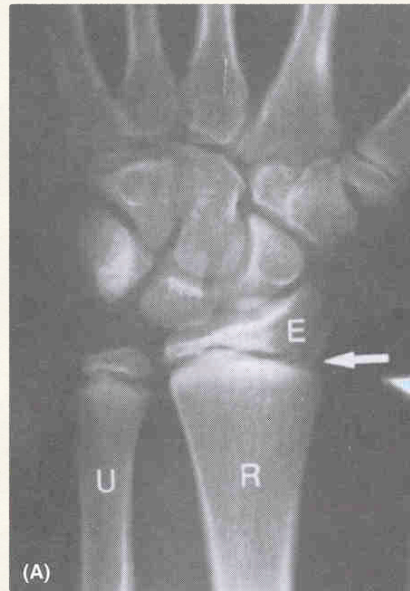
- \* Diaphysis: gövde
- \* Epiphysis: sekonder ossifikasyon merkezi
- \* Epifiz plakları
- \* Epifiz çizgisi
- \* Metaphysis: diaphysis ile epiphysis arası



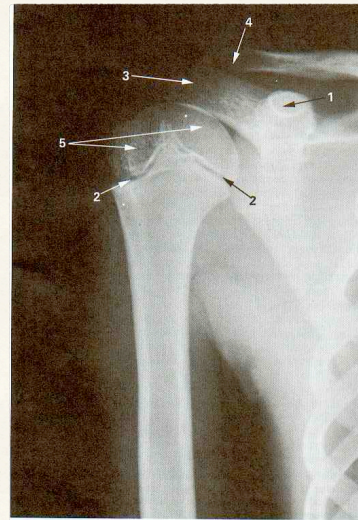
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(A)



3.181 Anteroposterior radiograph of the right shoulder in a boy aged 11. 1. Coracoid process. 2. Growth plate of cartilage at upper end of humeral diaphysis. 3. Acromion. 4. Lateral end of clavicle, not yet completely ossified. 5. Proximal humeral epiphysis. Note its conical junction with the diaphysis.

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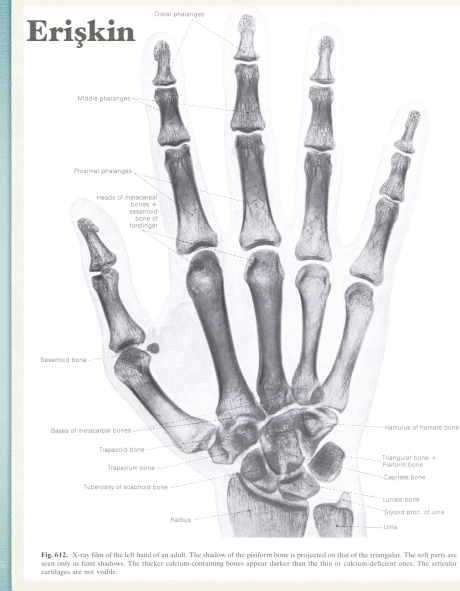


Fig. 612. X-ray film of the left hand of an adult. The shadow of the pisiform bone is projected on that of the triquetrum. The soft parts are seen only as faint shadows. The thicker calcium-containing bones appear darker than the thin or calcium-deficient ones. The articular cartilages are not visible.

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15,5 yaş

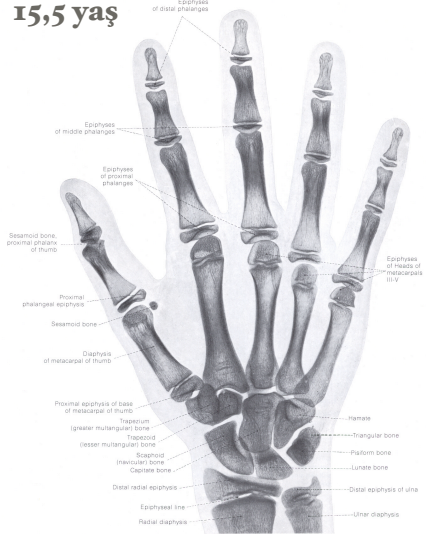


Fig. 613. X-ray film of the left hand of a 15½-year-old. The distal epiphyses of the radius and ulna, as well as those of the metacarpals and phalanges, are not yet united with their respective diaphyses. Note the definite epiphyseal lines.

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5,5 yaş

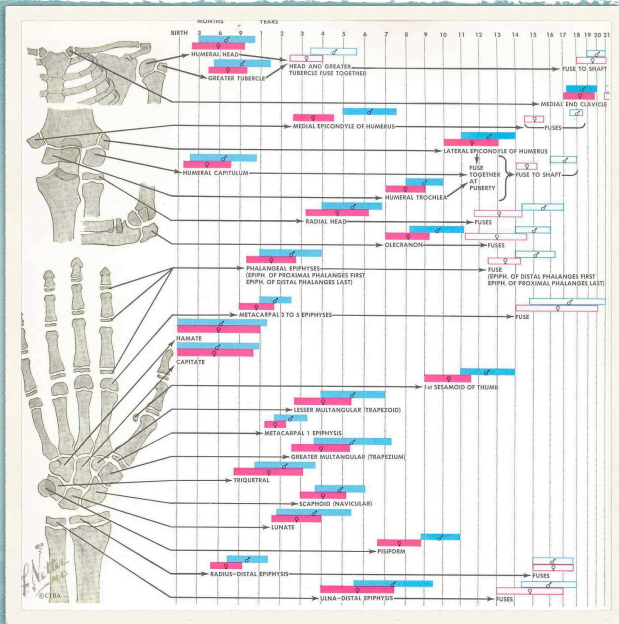


Fig. 614. X-ray film of the hand of a 5½-year-old boy. The phalanges of the fingers have only one proximal epiphysis; the metacarpals II-V have only one distal. From this, one can see the metacarpal of the thumb as the proximal phalanx of the thumb. The center of ossification of the trapezoid and lunate bones are still very small; that of the scaphoid is absent. It is, therefore, possible to determine the age of children through investigation of the ossification.

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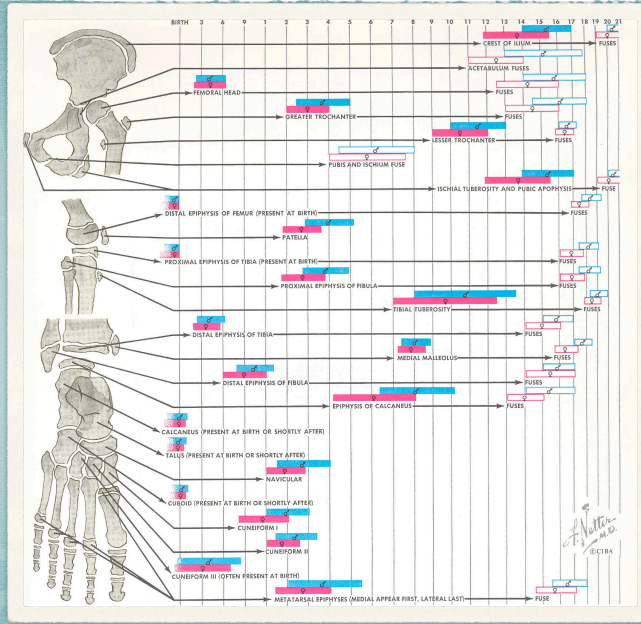
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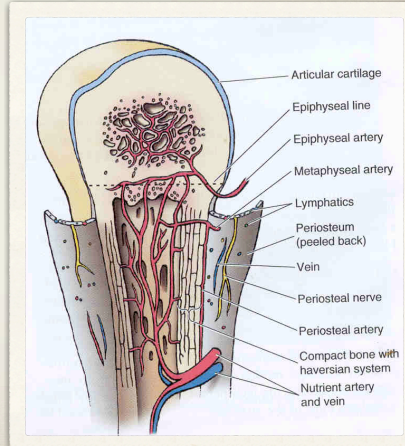
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# Kemiklerin Damarlanması ve İnervasyonu

- \* Arterler periost yoluyla girer
- \* Periosteal arterler
- \* Arteria nutiens
- \* Epifizeal arterler
- \* Metafizeal arterler
- \* Periosteal sinirler
- \* Duyu, ağrı
- \* Yırtılma, gerilme



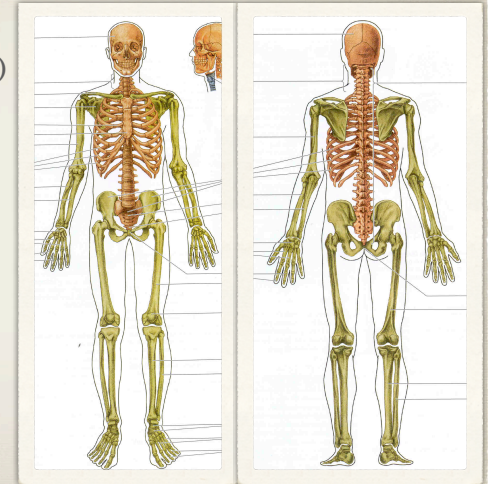
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# Kemiklerin Sınıflandırılması

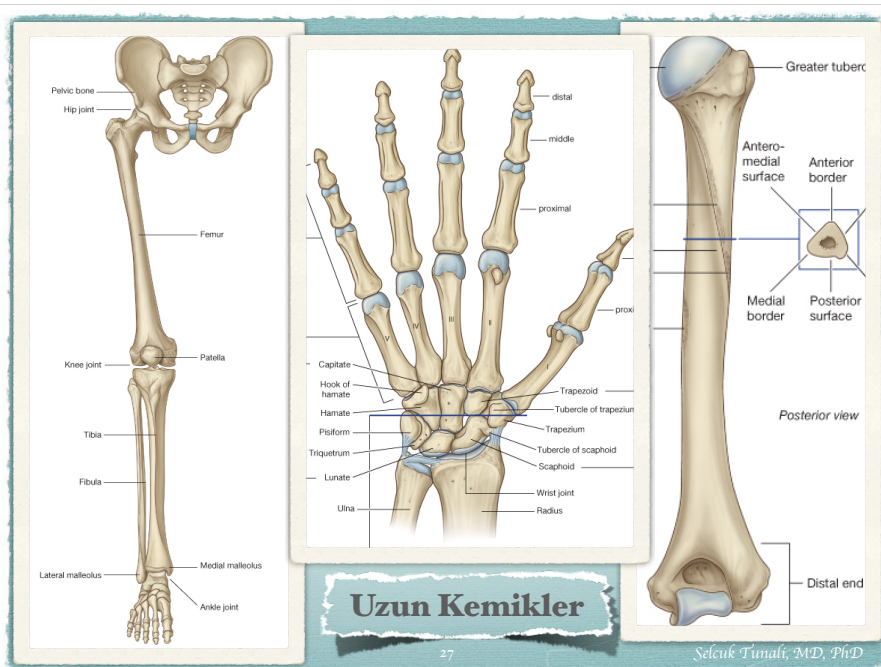
- \* Uzun (humerus, femur)
- \* Kısa (el & ayak bileği)
- \* Yassı (kafa)
- \* Düzensiz (mandibula, vertebra)
- \* Sesamoid (patella)
- \* Pnömatize/havalı (maxilla, os frontale)



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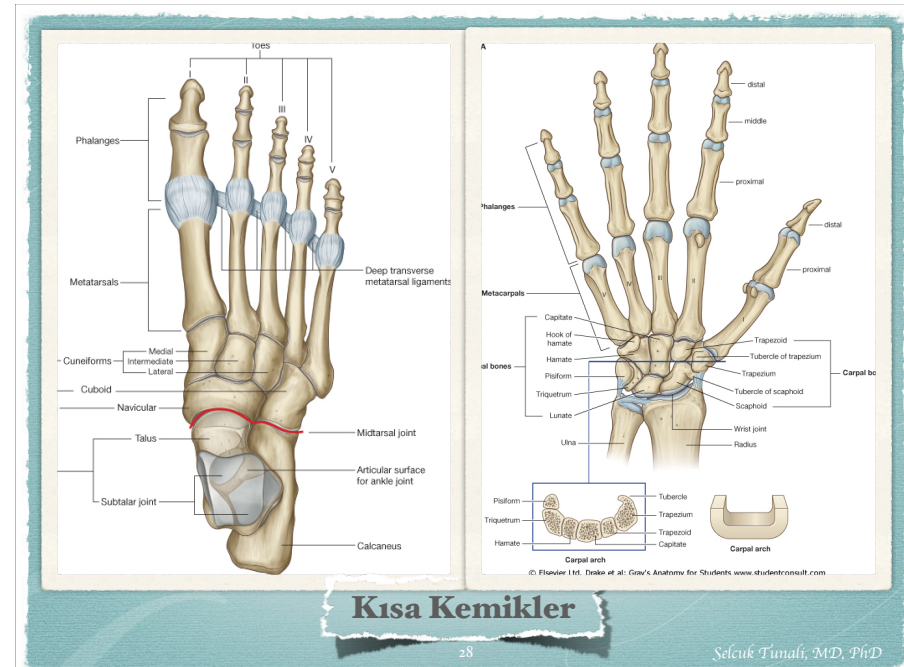


## Uzun Kemikler

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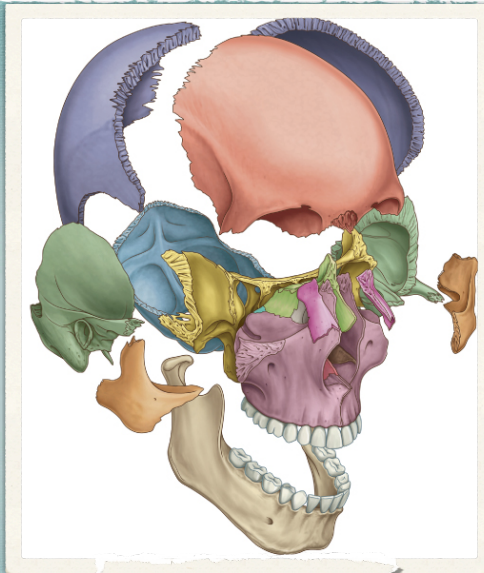
## Kısa Kemikler

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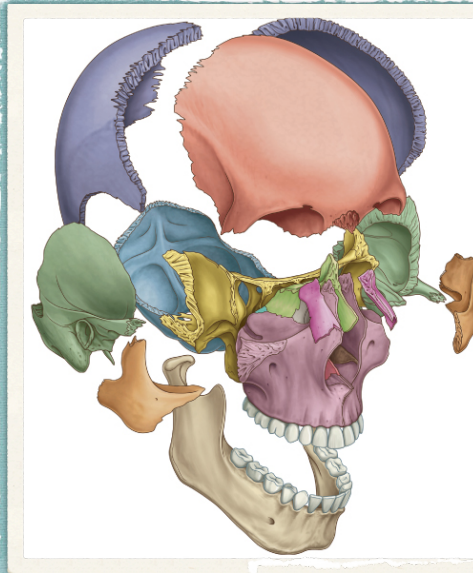


**Yassı Kemikler**

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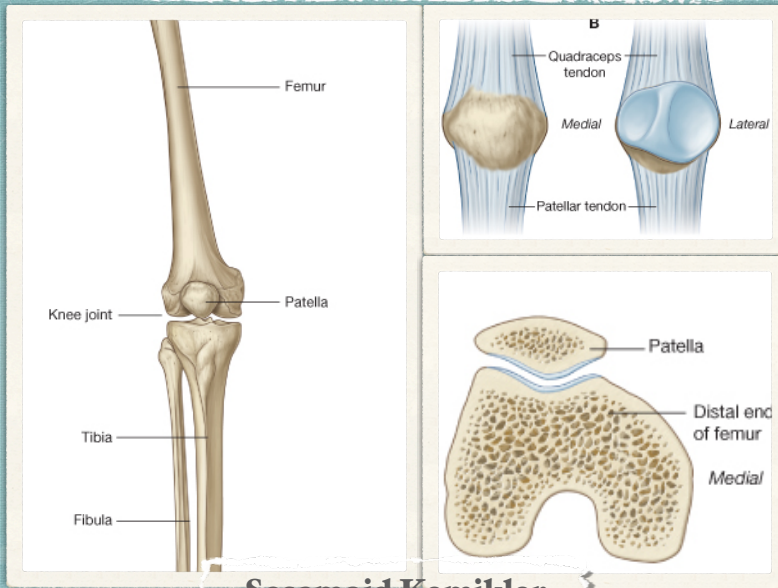
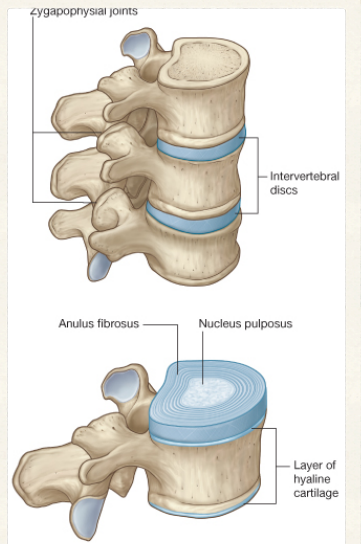


**Düzensiz Kemikler**

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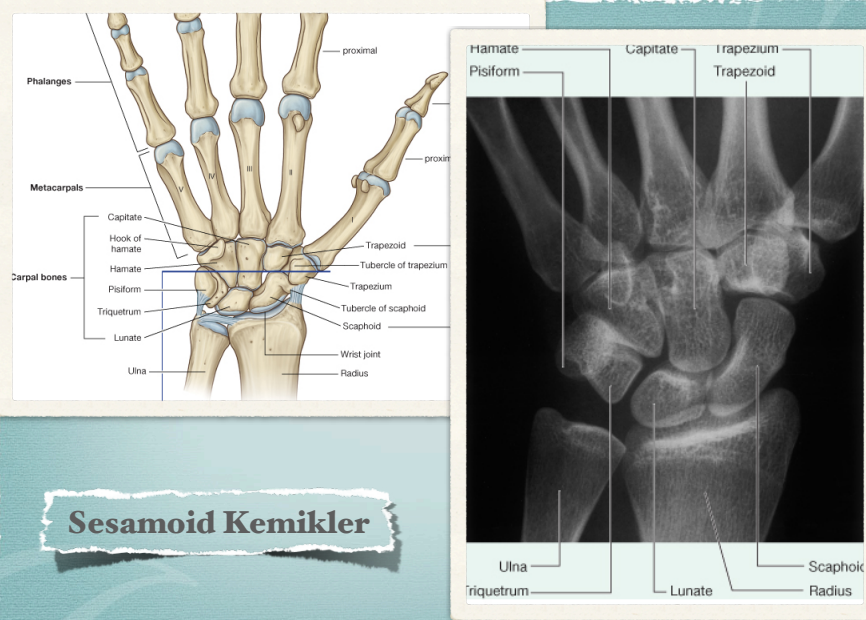


**Sesamoid Kemikler**

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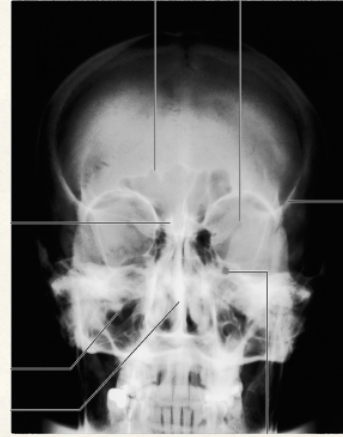
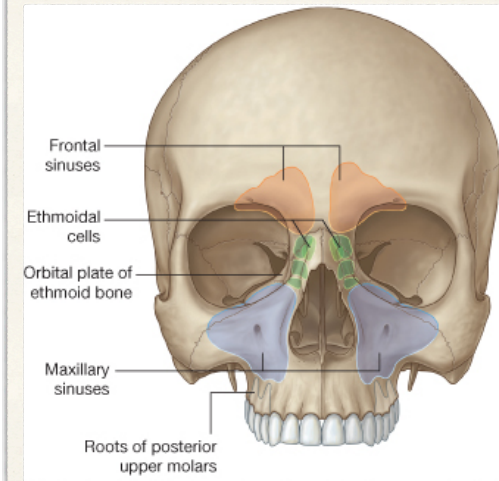
**Sesamoid Kemikler**

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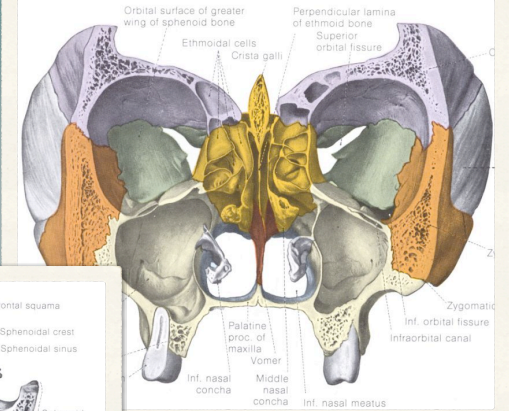
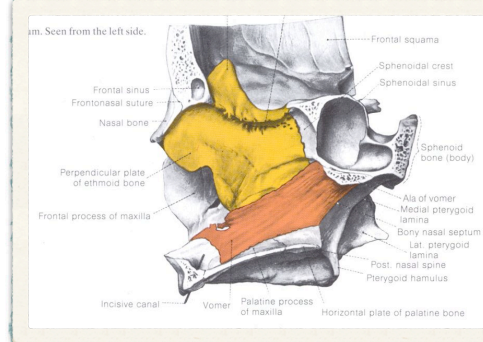


### Pnömatize Kemikler

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### Pnömatize Kemikler

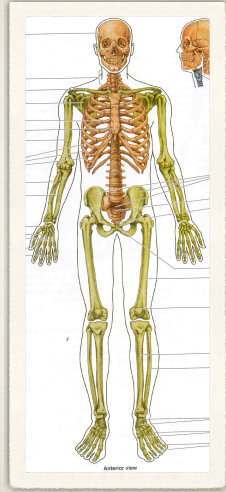
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## İskelet

- \* Aksiyal
- \* Baş
- \* Boyun
- \* Gövde
- \* Apendiküler
- \* Üst ekstremité
- \* Alt ekstremité



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## Kemiklerdeki Oluşumlar

- |                      |            |
|----------------------|------------|
| * Processus          | * Fossa    |
| * Tuberculum         | * Crista   |
| * Tuberositas        | * Collum   |
| * Sulcus             | * Foramen  |
| * Spina              | * Incisura |
| * Facies             | * Linea    |
| * Facies articularis | * Sinus    |

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## Klinik Bilgi – 1

- \* Aksesuar kemikler
  - \* Genellikle bir kemiğin eksik kalan parçası şeklinde
  - \* Sutural veya wormian (Inca) kemikler
- \* Heterotopik kemikler
  - \* Bale dansçılarının bacaklarında
  - \* At binicilerin uyluklarında
    1. Hemorajik bölgeler
    2. Kalsifikasyon
    3. Ossifikasyon

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## Klinik Bilgi – 2

- \* Kırıklar
  - \* Kırık uçların bir araya getirilmesi (redüksiyon)
  - \* Fibroblast → kallus
  - \* Kalsifikasyon
  - \* Ossifikasyon
- \* Çocuklarda
  - \* Yeşil ağaç kırıkları
  - \* Esneme nedeniyle tam olmayan kırıklar
  - \* Erişkinlerden daha hızlı iyileşme

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## Klinik Bilgi – 3

- \* Kemikler canlı organlardır
  - \* Ağrı
  - \* Kanama
  - \* Yaşla birlikte değişim
  - \* Atrofi (küçülme)
- \* Hipertrofi (büyüme)
  - \* Kan damarları
  - \* Lenfatikler
  - \* Sinirler
  - \* Hastalıklar
  - \* Tümörler

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## Klinik Bilgi – 4

- \* Osteoporoz
- \* Kemik bileşenlerinin kaybı
- \* İnorganik
- \* Organik
- \* Kadın VE erkek
- \* Kemik iliği incelemesi
- \* Hematolojik hastalık tanısı
- \* Aspirasyon veya biyopsi
- \* Ilium
- \* Sternum

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## Klinik Bilgi – 5

- \* Kemik yaşı belirlenmesi
- \* Klinik tıp
- \* Adli bilimler
- \* Antropoloji
- \* Radyogramlar kullanılır
- \* Diafiz ve/veya epifizde kalsifiye materyal görünümü
- \* Epifiz plağını temsil eden koyu çizginin kaybolması

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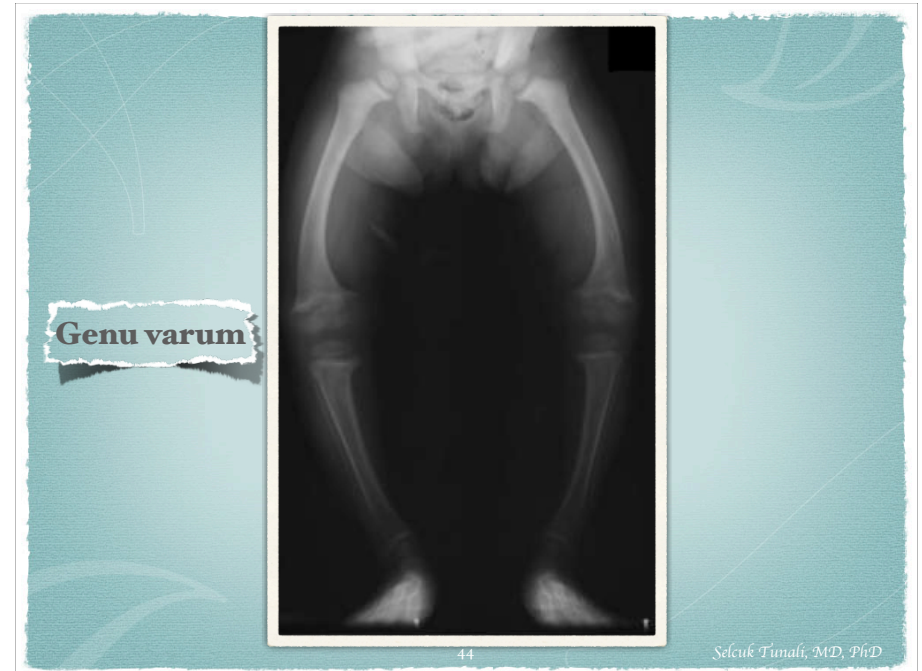
## Klinik Bilgi – 6

- \* Avasküler nekroz
- \* Arter kanlanmasının kaybı
- \* Epifiz veya diğer bölgelerde
- \* Rikets/raşitizm
- \* Vitamin D eksikliği
- \* Eksik kalsifikasyon
- \* Kemiklerde yumuşama
- \* Deformite ve kırıklara yol açar

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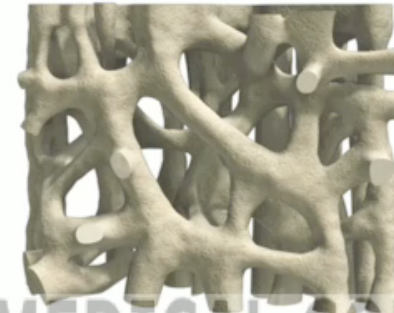
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## Osteoporoz

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## Osteoporoz

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