ORTOPEDSKA HIRURGIJA I TRAUMATOLOGIJA

Medicinska specijalnost koja se bavi proučavanjem, sprečavanjem i lečenjem bolesti i povreda organa za kretanje.

Preklapanje sa drugim specijalnostima

plastična hirurgija

neurohirurgija

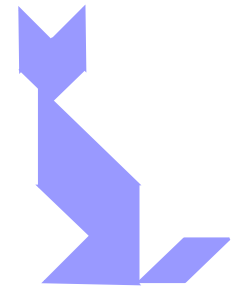
dečja hirurgija

neurologija

reumatologija ..

Francuska i

nemačka škola



Istorija ortopedije

- Student je jednom pitao antropologa Margaret Mid, „ Koji je najraniji znak civilizacije? “ Učenik je očekivao da će njen odgovor biti glinena posuda, kamen za mlevenje ili možda oružje.
- Margaret Mid je na trenutak razmislila, a zatim rekla: „Zarasla butna kost.“
- Femur je najduža kost u telu, povezuje kuk sa kolenom. U društvima bez blagodati moderne medicine potrebno je oko šest nedelja mirovanja da bi prelomljena bedrena kost zarasla. To pokazuje da je neko brinuo za povređenu osobu, obavljao lov i sakupljanje, ostao s njima i pružao fizičku zaštitu i ljudsko druženje dok se povreda ne oporavi.
- Mid je objasnila da tamo gde vlada zakon džungle - opstanak najsposobnijih - nema zalečenih butnih kostiju. Prvi znak civilizacije je saosećanje, viđeno u zalečenoj butnoj kosti “.

Istorija ortopedije

- Od početka pisane istorije

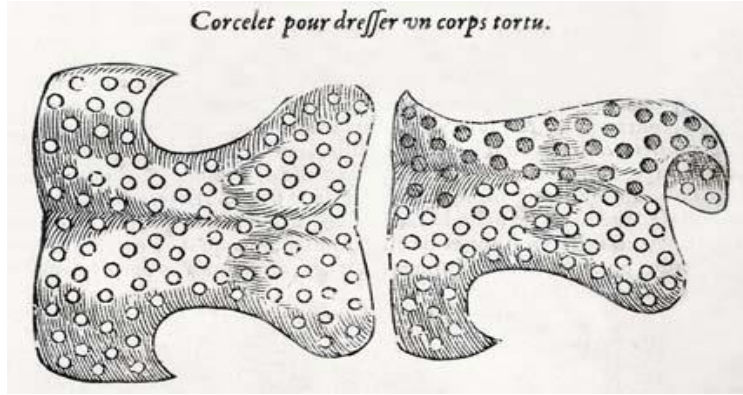
- Verovatno prvi opis lečenja deformiteta kičmenog stuba je zabeležen u (Srimad Bhaguat Mahapuranam), drevnom indijskom epu (između 3500 i 1800 p.n.e.)
  - Krišna leči od grbe jednu od svojih žena koja se zove Kubja primenom aksijalne vuče
- papirus Edvina Smita (iz 16. veka p.n.e)

Istorija

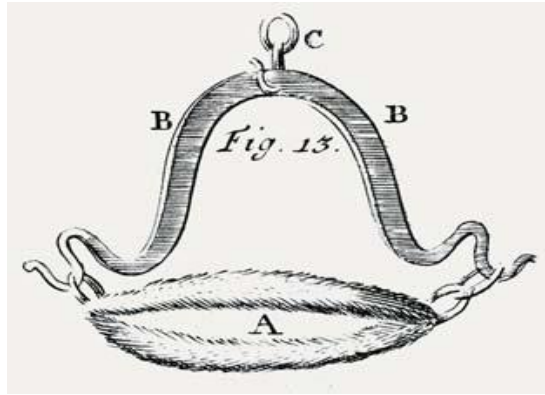
- Hipokrat (460-370 pne) i njegovi učenici (odvojio medicinu od magije i kulta i uveo empirijsku praksu)
- Prvi medicinski pristup bolestima i deformitetima skeleta.
- Galen iz Pergamona (130-200 ne) je prvi uveo pojmove skolioza, kifoza i lordoza u medicinsku terminologiju

Istorija

- Ambroise Par'e (1510-1590)
  - lečenje skolioza ortozom
  - ligatura krvnog suda



- Glisson Frensis (1616-1691)
  - (rahitis) 1660



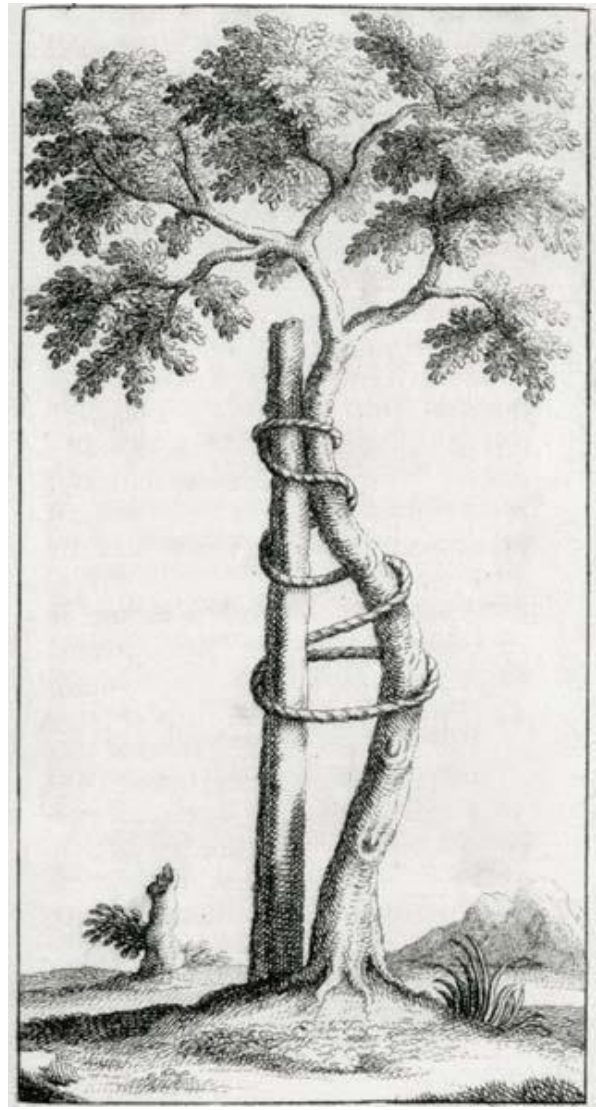
ORTOPEDIJA

L'Orthop'edie

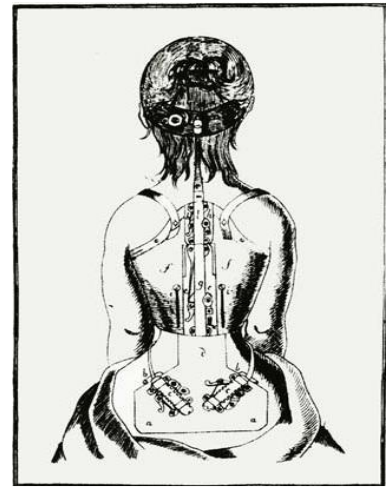
(orthos-ravan, uspravan i paidon-dete)

L'Orthop'edie (1742) autora Nicholas Andry

Ortopedija, ili umeće sprečavanja i ispravljanja deformacija tela u dece



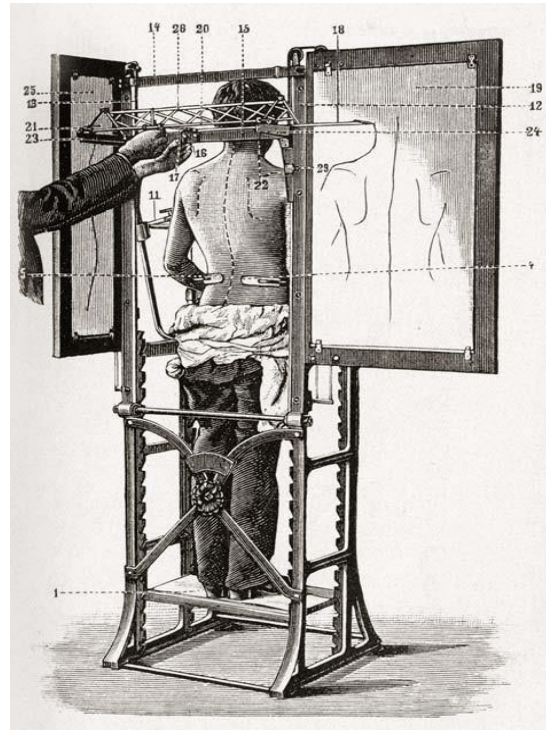
- Žan-Andr'e Venel (1740-1791)
  - Prva ortopedska ustanova 1780 u Orbeu
    lekari + mehaničari
  - Ortoza za dan za skoliotične pacijente



- 1812 Delpech u Montpellier-u;

1816 Heine u Wurzburg-u;

1845. Hirsh u Pragu



- Pott 1779; Scarpa (ekvinovarus) 1803; Dupuytren (lux. kukova) 1826; sir Cooper 1822;

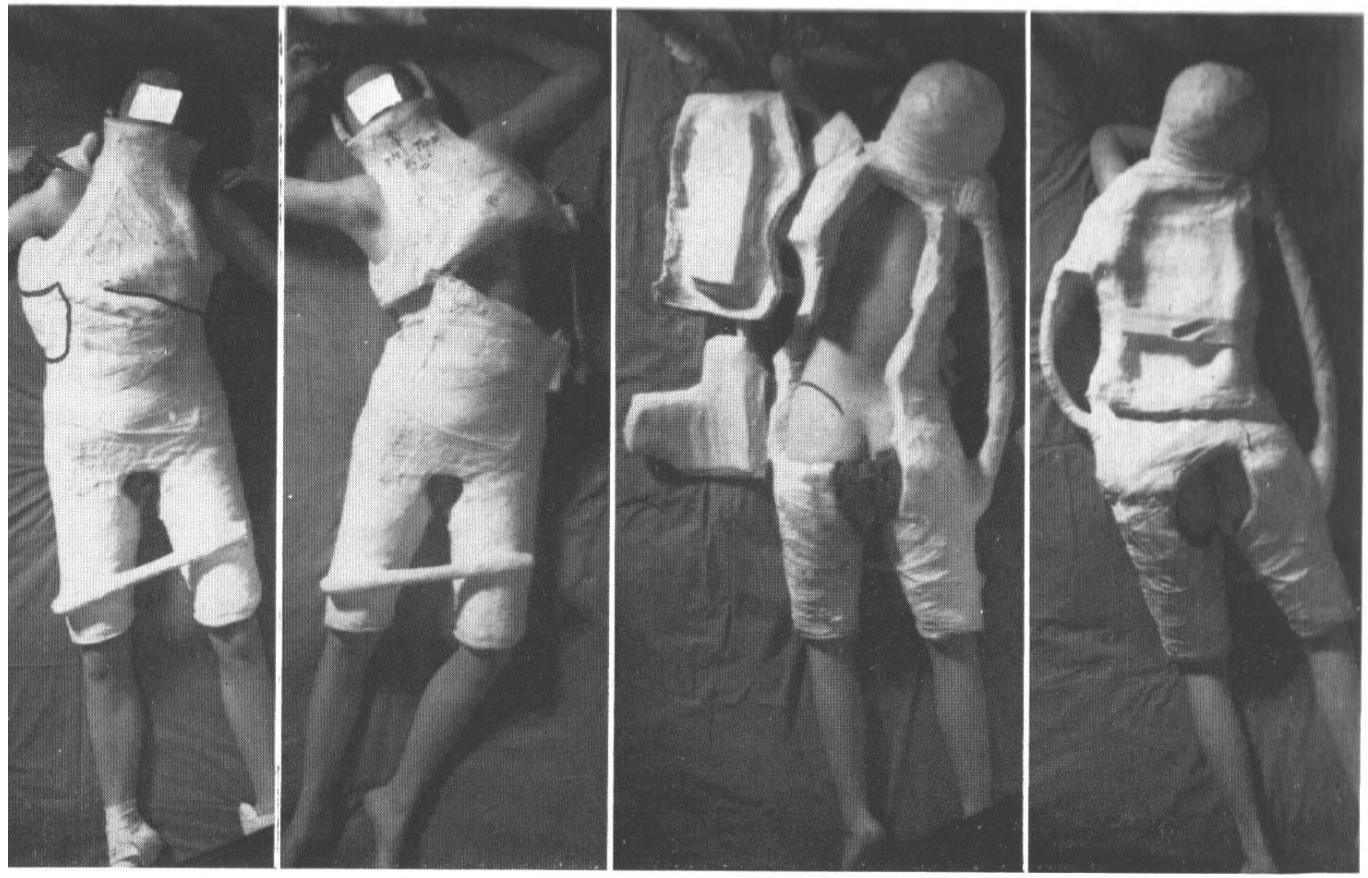
Razvoj konzervativne ortopedije →

gipsani zavoj

Dieffenbach (ekvinovarus) XVIII vek

Antonius Mathysen (Holandija) 1852.

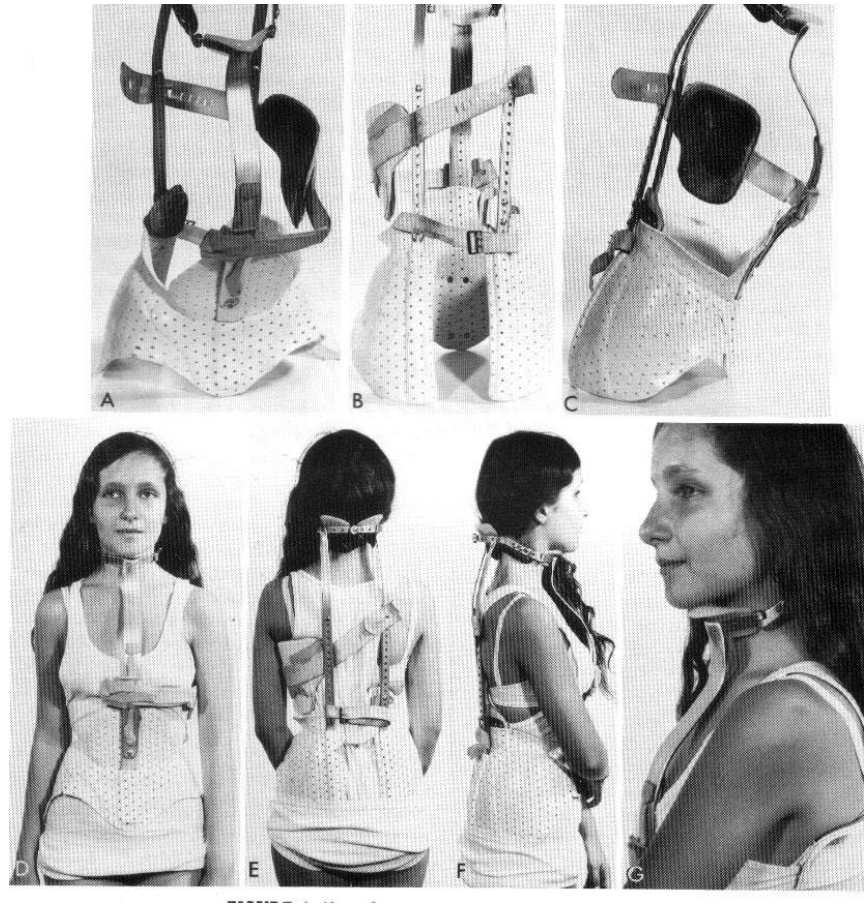
Riser



ORTOZE

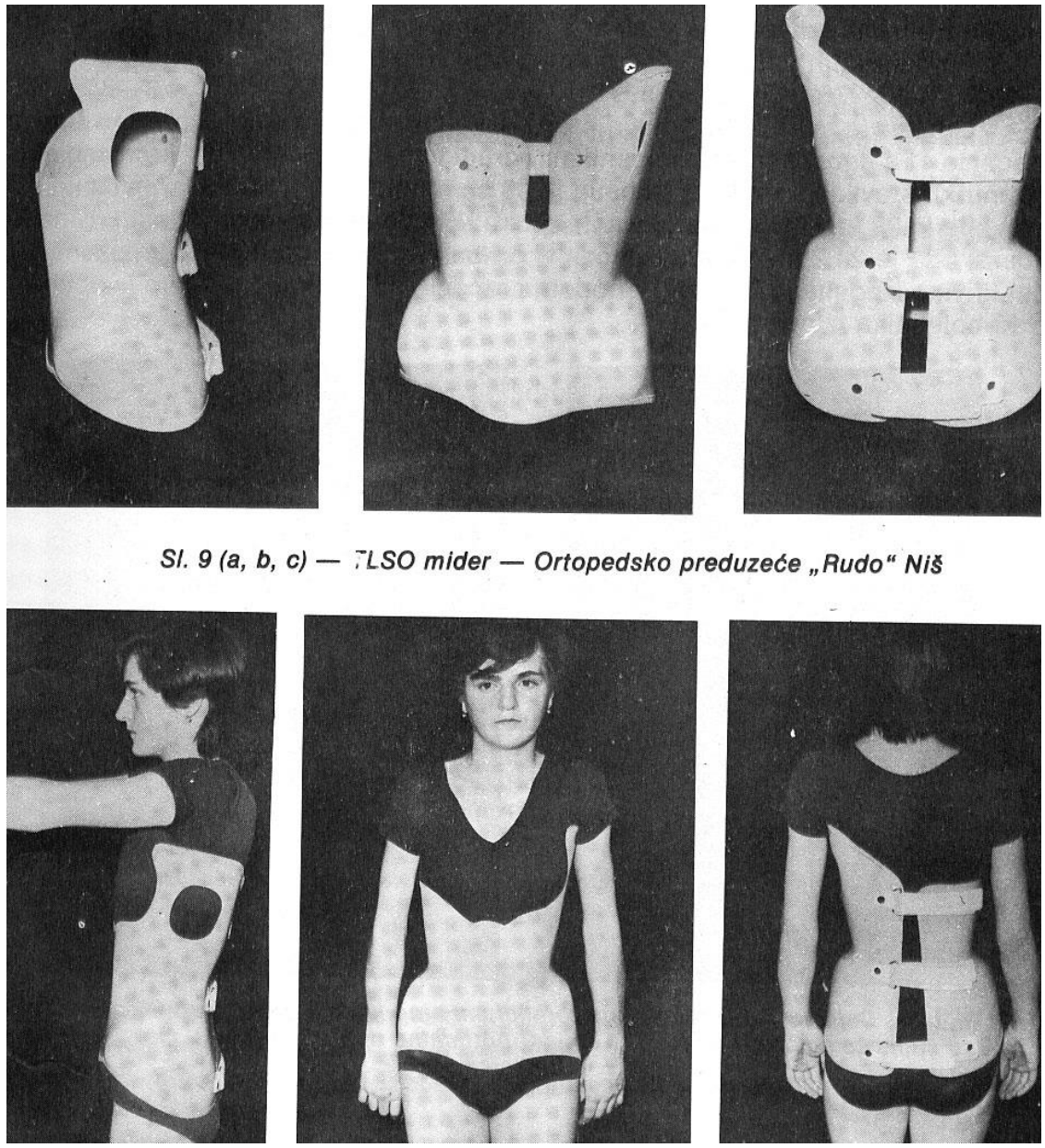
- Walter Putnam Blount (1900-1992)

Godine 1945, Blount je uveo takozvanu "Milvoki ortozu",



TLSO mider

John Hall i Vilijem Miler iz dečje bolnice u Bostonu



Sl. 9 (a, b, c) — TLSO mider — Ortopedsko preduzeće „Rudo" Niš

- Ortolani
- Pavlik
- Graf
- Salter
- ….

Hirurška ortopedija

Delpech (neuspeh)

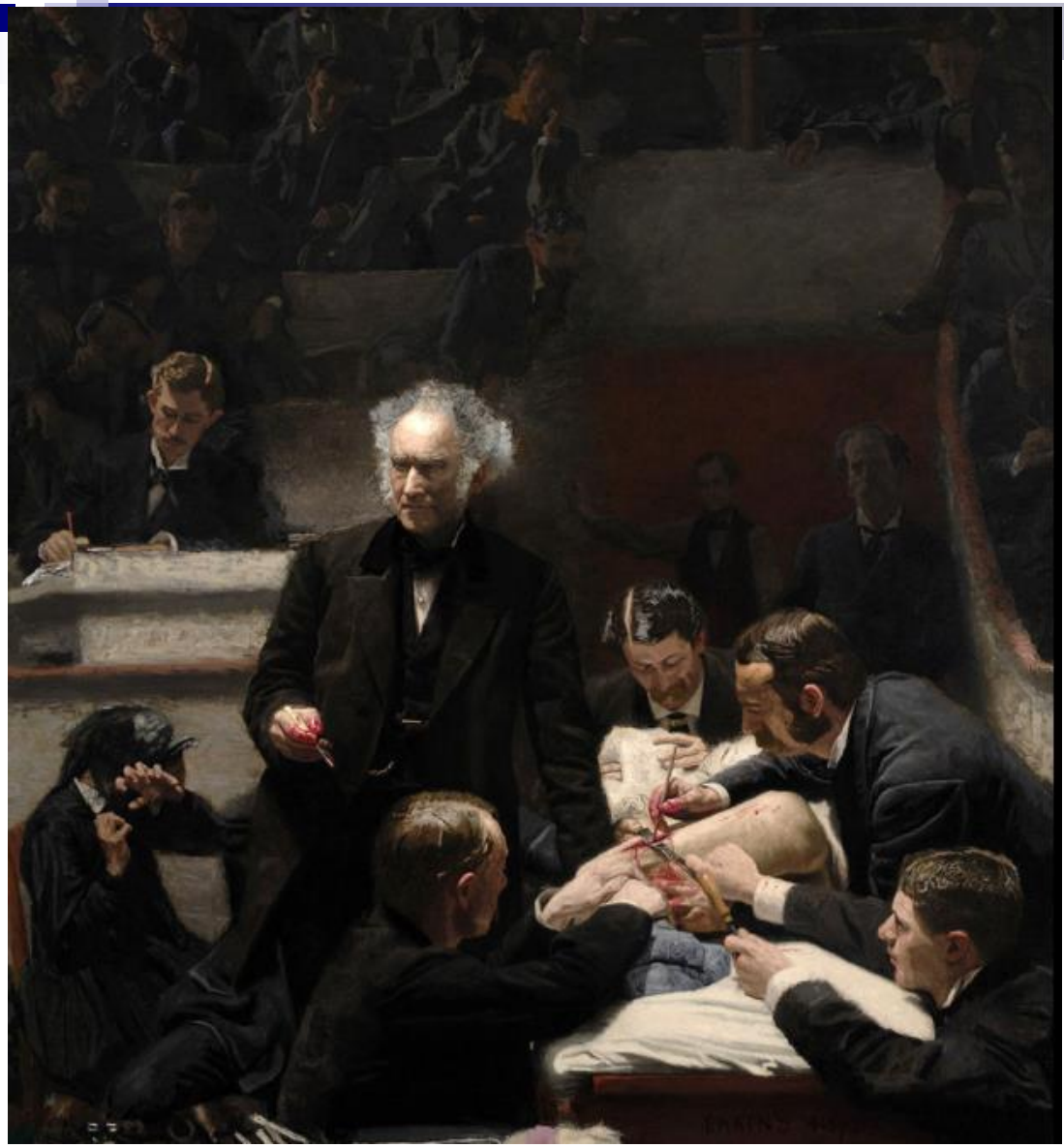
Georg Friedrich Stromeyer subkutana tenotomija 1831.

Little (cerebralna paraliza)

John Barton 1824. osteotomija;

Langenbeck 1854. zatvorena osteotomija

Langebeck je 1858. prva osteosinteza vrata femura

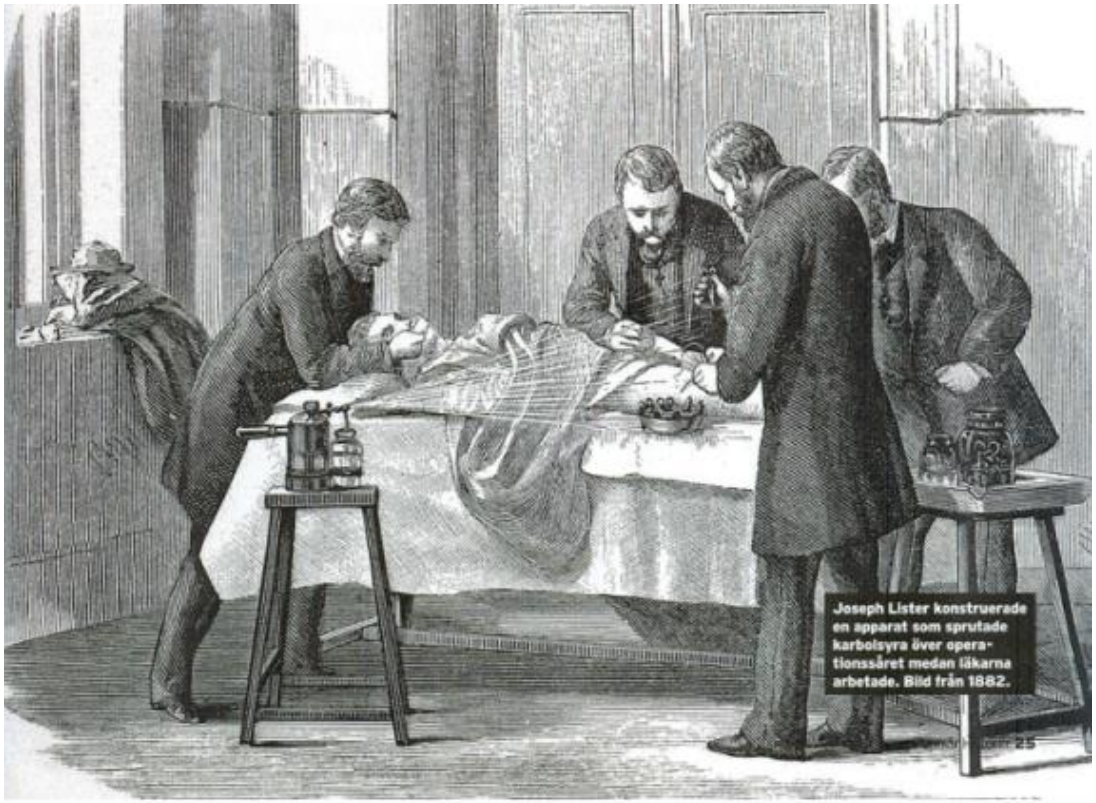


The Gross Clinic (1875)

- Razvoj anestezije V decenija
  19.v (etar i hloroform)
- Razvoj antisepse
  Joseph Lister (Glazgov)

- Horace Wells 1845.
  - NO
- William Thomas Green Morton
  - diethyl ether

Antiseptic Principle of the Practice of Surgery *The Lancet* March - July 1867



ON THE ANTISEPTIC PRINCIPLE IN THE PRACTICE OF SURGERY.*

By JOSEPH LISTER, Esq., F.R.S.,

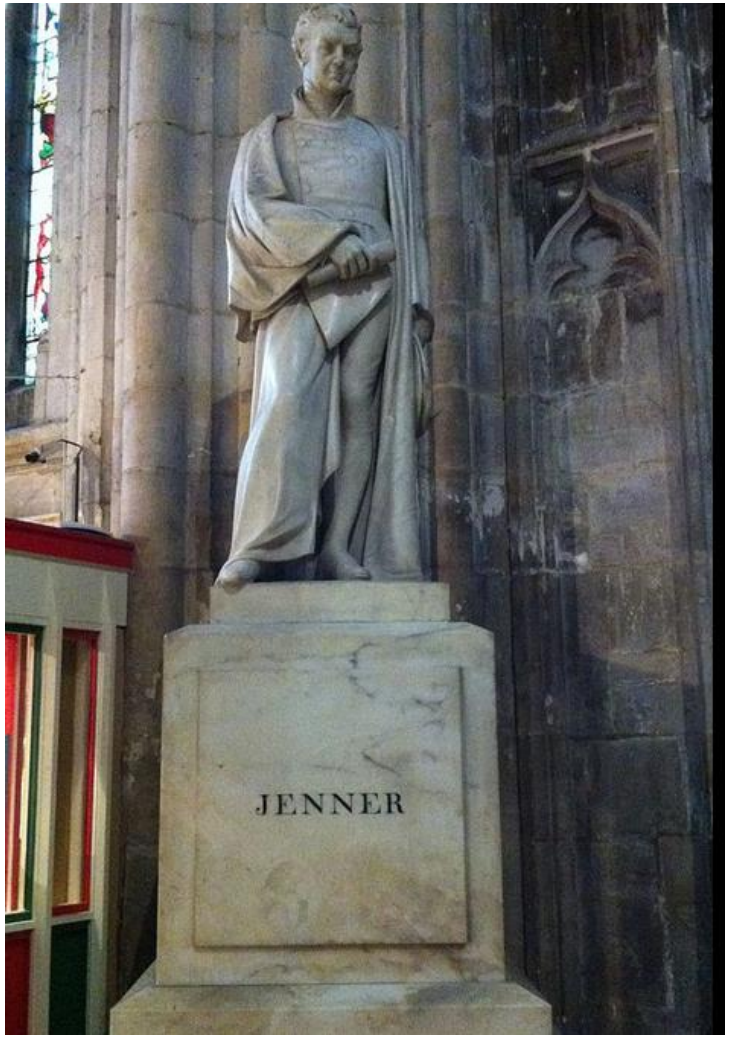
1869, British Medical Association at Leeds

The Agnew clinic

- Wilhelm Konrad Röntgen 1895.
- Transfuzija krvi 1818.g. prva uspešna;
  - krvne grupe Karl Landsteiner 1900.

- RTG šake kralja Petra I

iz 1905 godine



"Otac imunologije„
"Čovek čiji je rad sačuvao više života od bilo kog drugog"

Imunologija ; vakcine

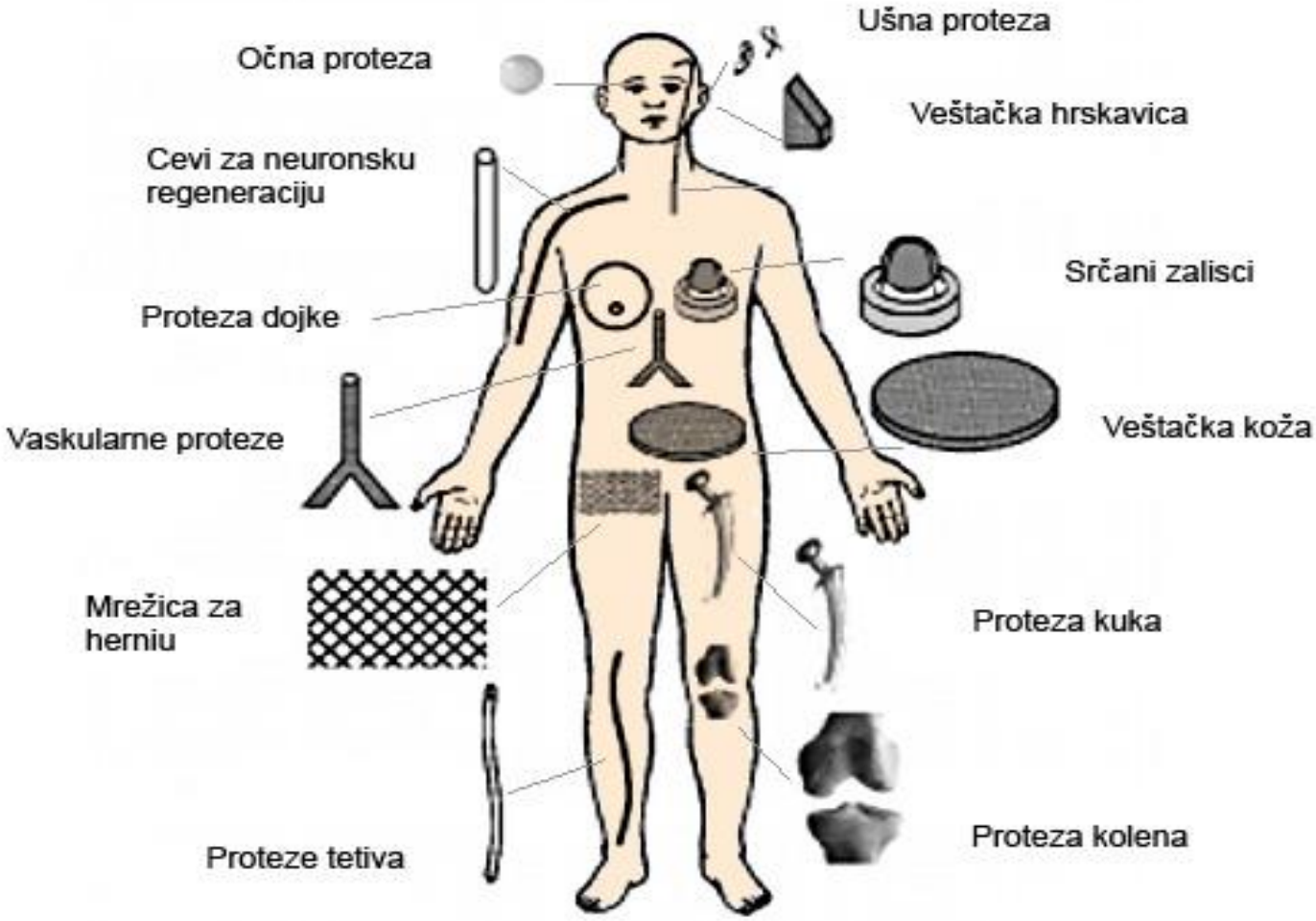
- BCG
- Salk; Sabin

Hirurška ortopedija

- Lane; Lambot
- Veštačke zamene zgloba Hey Groves 1926.
- 1940. godine Moore vitalijumska proteza.
- braća Judet
- AO škola 1958 –Biel

Svojstva materijala za primenu u biomedicini

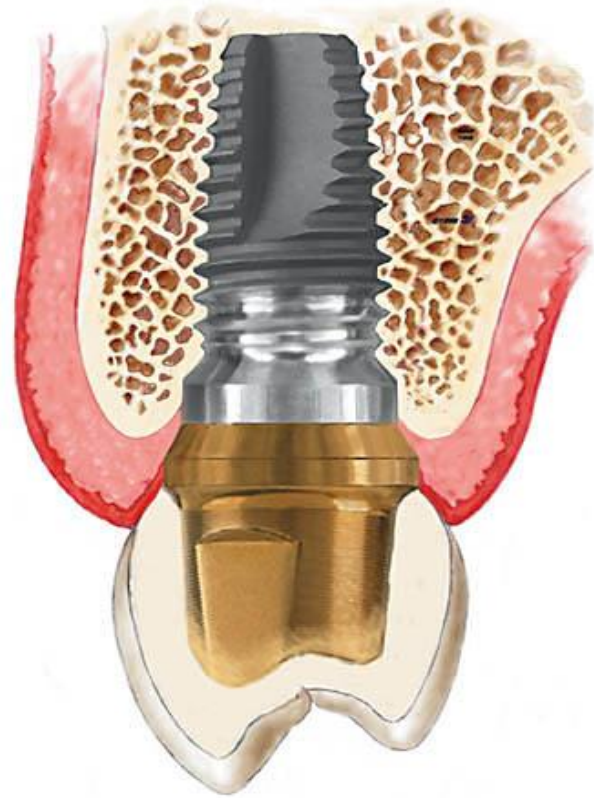
- *Biokompatibilnost*
- *Netoksičnost*
- *Otpornost prema koroziji*
- *Čvrstoća i žilavost*
- *Dinamička izdržljivost*
- *Otpornost na habanje*
- *Odgovarajuća vrednost modula elastičnosti*
- *Troškovi*


Ušna proteza
Očna proteza
Veštačka hrskavica
Cevi za neuronsku regeneraciju
Srčani zalisci
Proteza dojke
Veštačka koža
Vaskularne proteze
Mrežica za herniu
Proteza kuka
Proteze tetiva
Proteza kolena

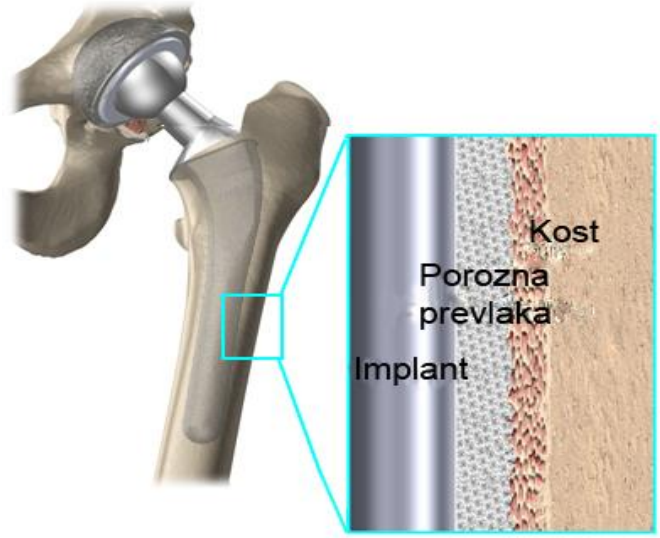
Nerđajući čelici

Co-Cr legure

Titan i njegove legure

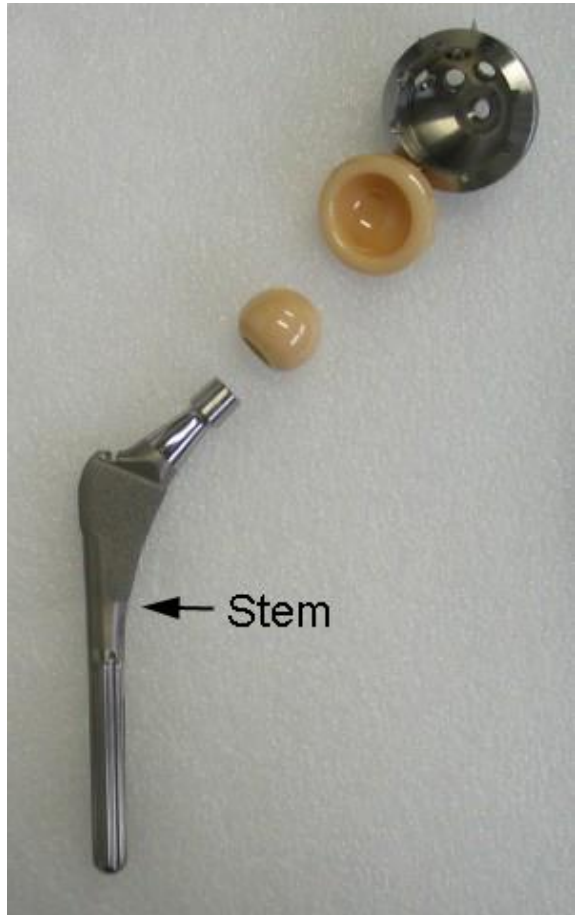


Porozne prevlake



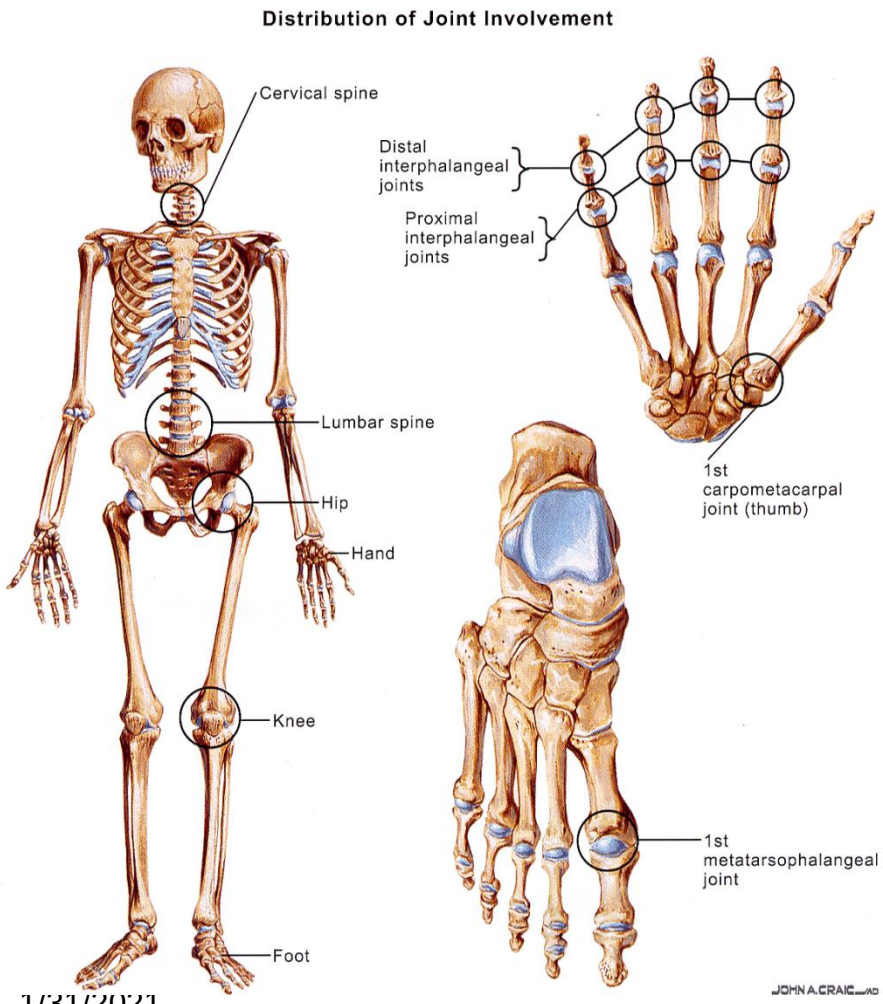
Komponente endoproteze od keramičkih materijala

Delovi proteza od polietilena (UHMWPE)


Stem

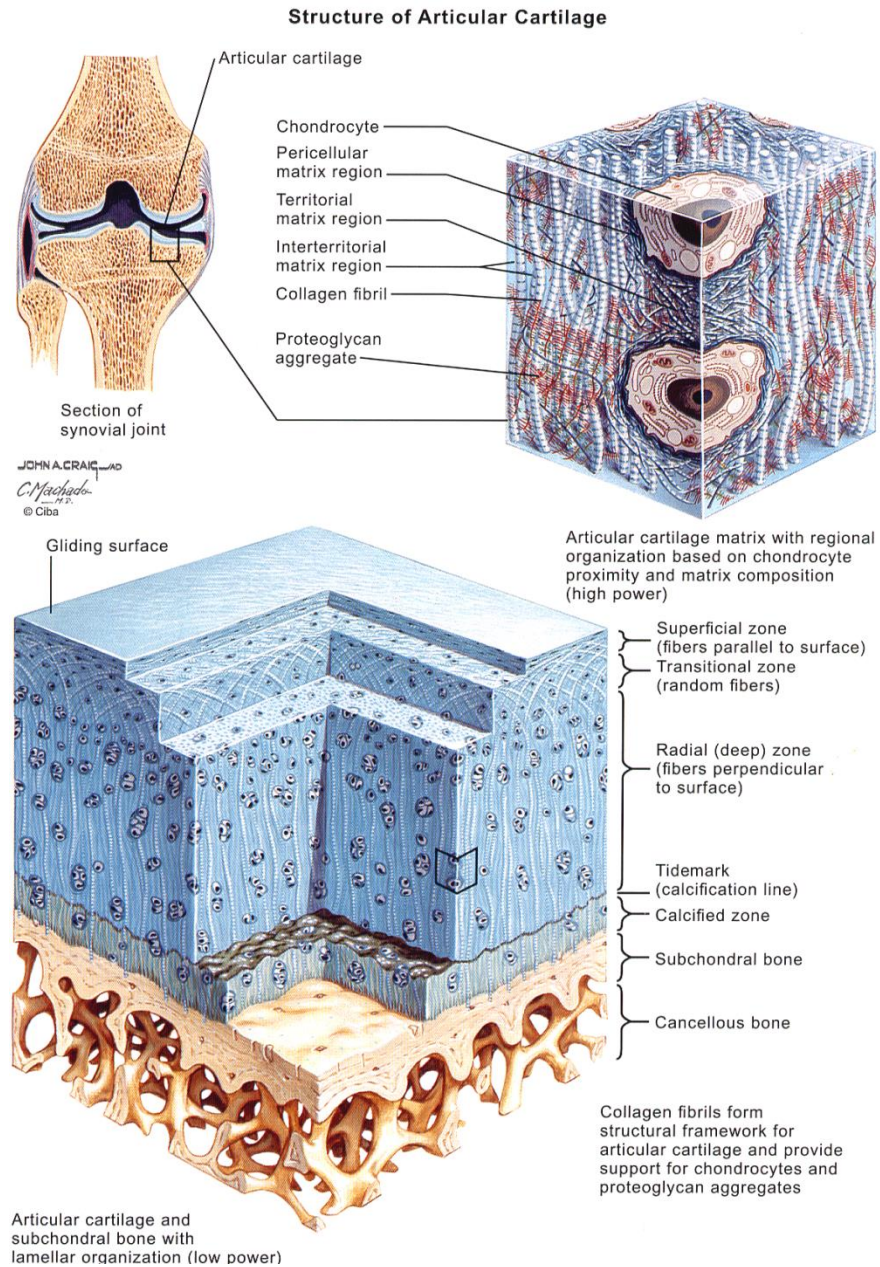
Bioresorptivni materijali

Lokomotorni aparat

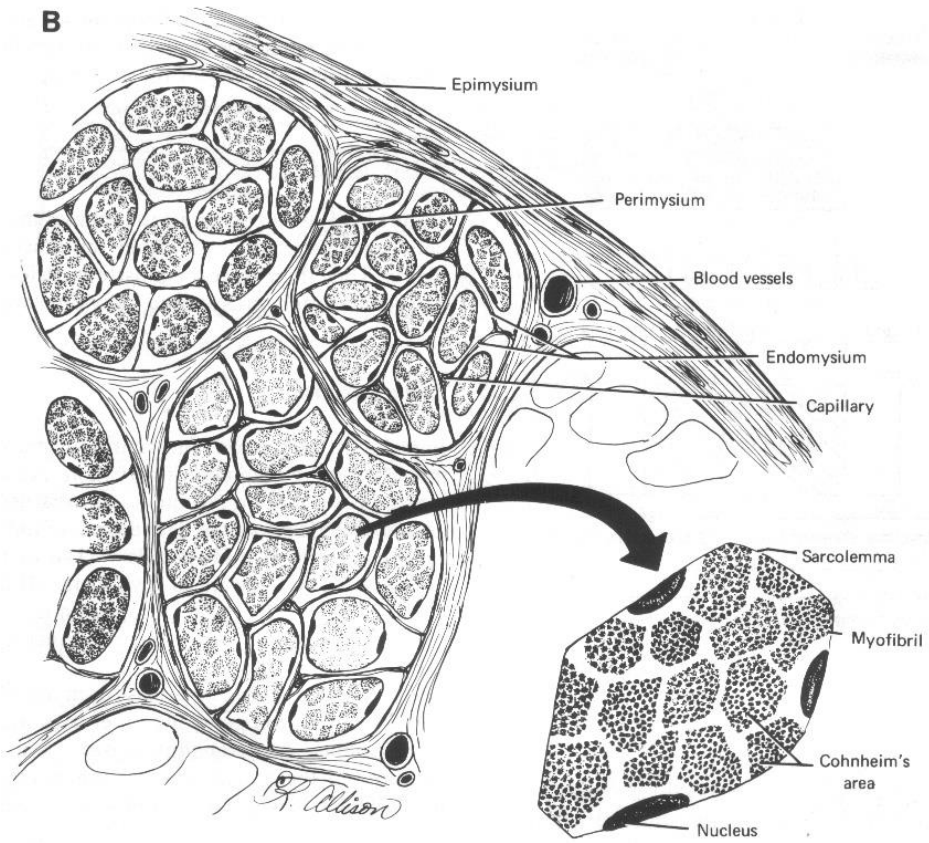


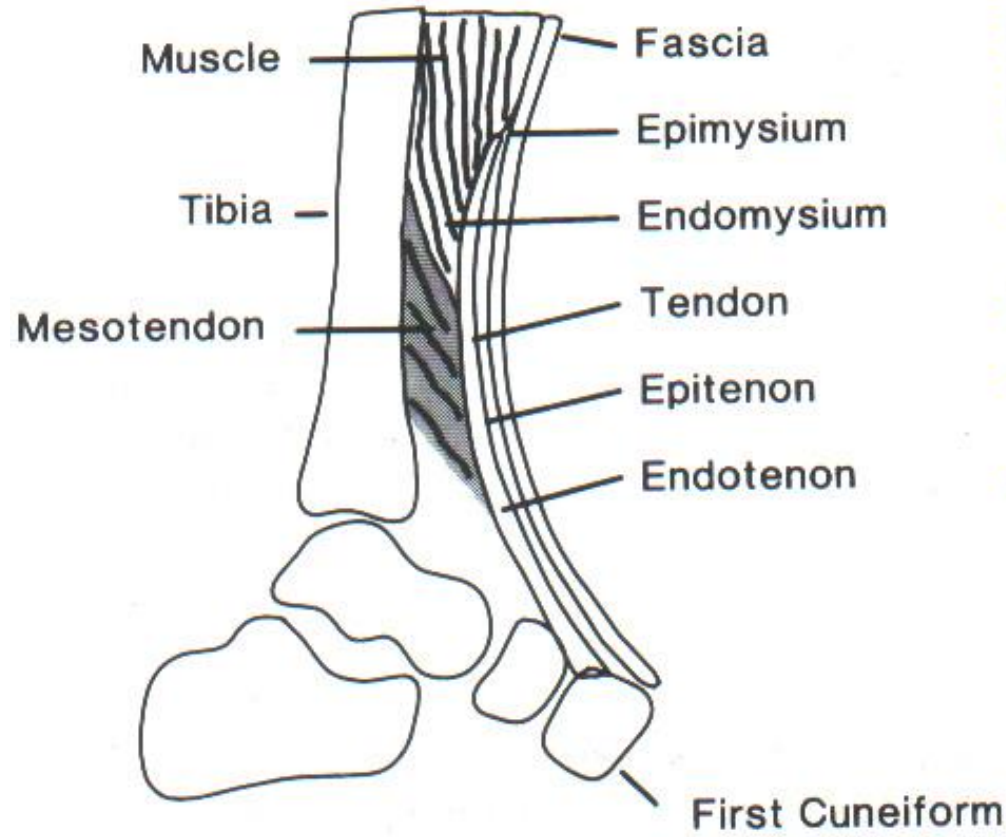
- aksijalni i
- apendikularni skelet

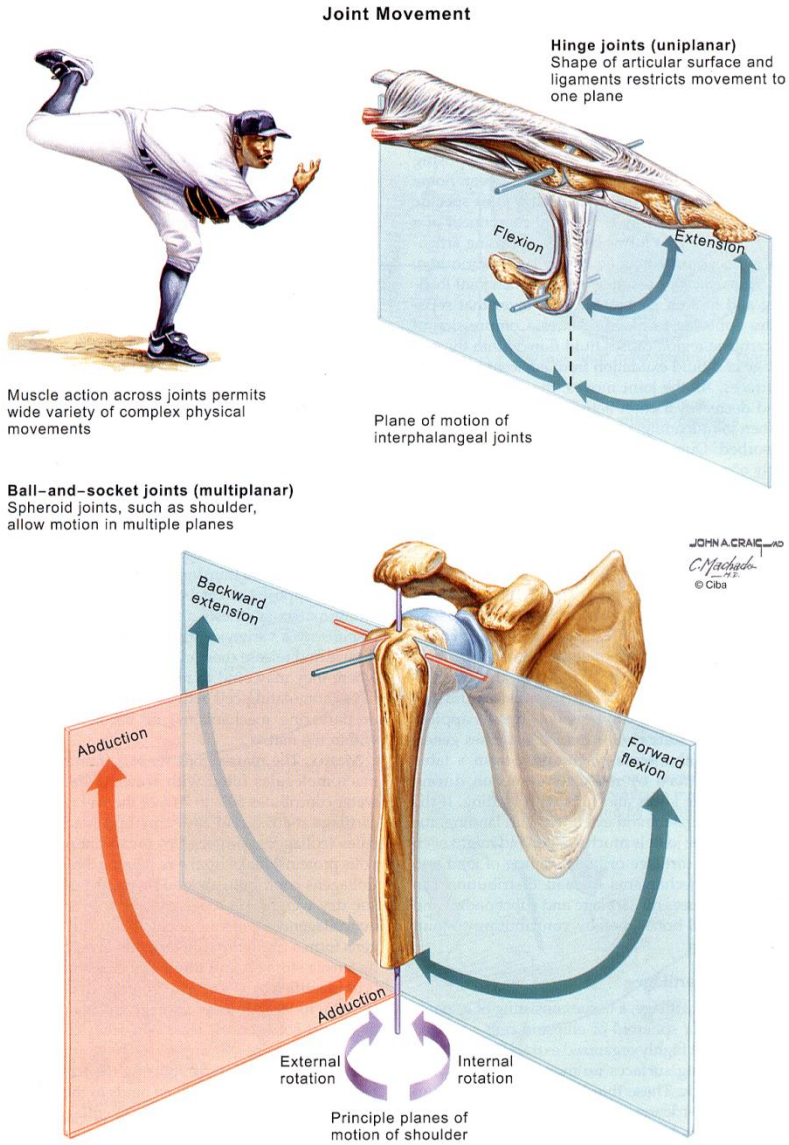
hrskavica


Structure of Articular Cartilage
Articular cartilage
Chondrocyte
Pericellular matrix region
Territorial matrix region
Interterritorial matrix region
Collagen fibril
Proteoglycan aggregate
Section of synovial joint
JOHN A. CRAIG, M.D.
C. Machado
© Ciba
Articular cartilage matrix with regional organization based on chondrocyte proximity and matrix composition (high power)
Gliding surface
Superficial zone (fibers parallel to surface)
Transitional zone (random fibers)
Radial (deep) zone (fibers perpendicular to surface)
Tidemark (calcification line)
Calcified zone
Subchondral bone
Cancellous bone
Collagen fibrils form structural framework for articular cartilage and provide support for chondrocytes and proteoglycan aggregates
Articular cartilage and subchondral bone with lamellar organization (low power)

Mišići i tetive







Privremeni:

- Sinostoze (suture i fontanele)
- Sinhondroze (fize rasta)

Stalni:

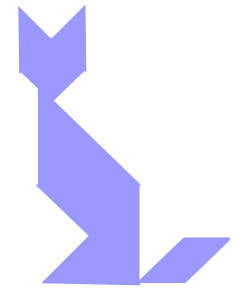
- Symphysis
- Syndesmosis
- Diarthros

Koštani sistem

- Metabolizam minerala i soli
- Hematopoeza
- Zaštita visceralnih organa
- Lokomotorni organi

Struktura i građa kosti

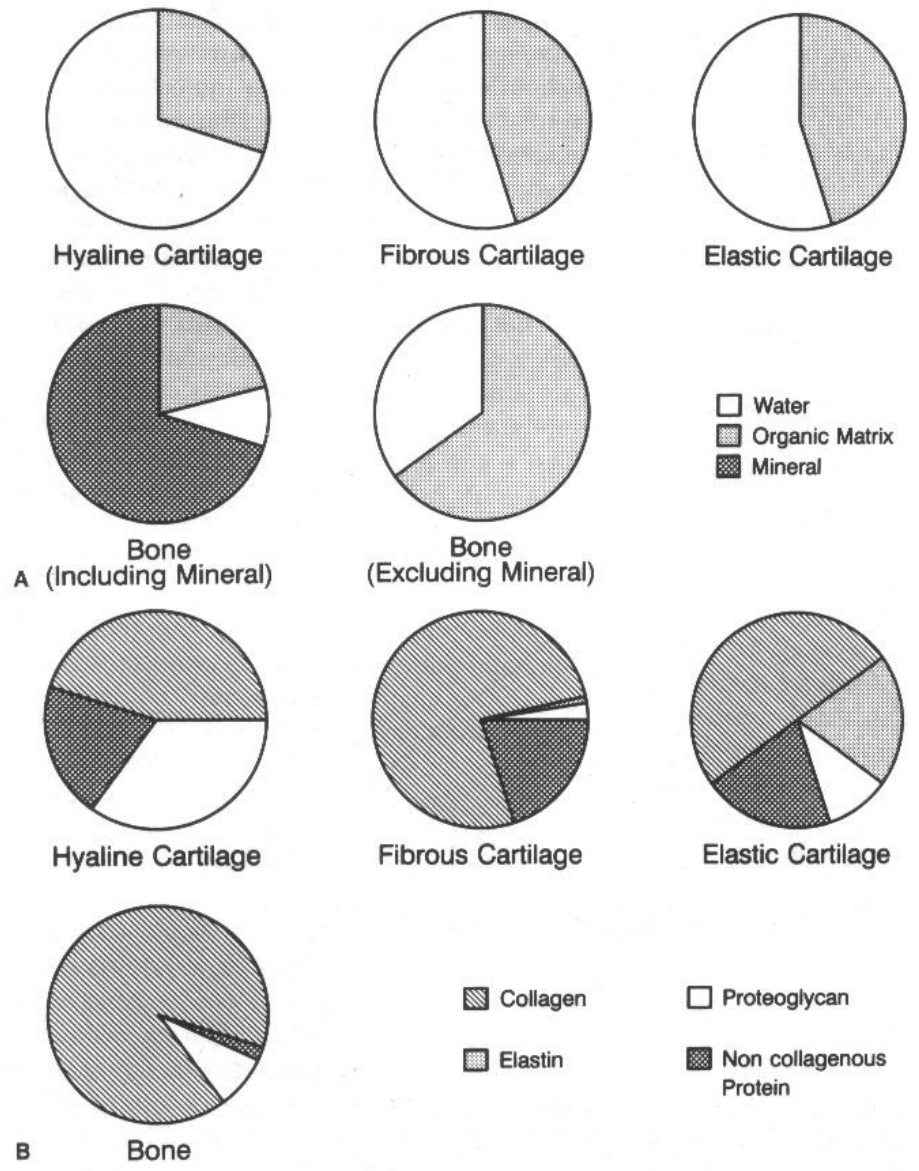
- Koštano tkivo je osnovno tkivo skeleta
- dve komponente:
- ćelije i
- međućelijska supstanca



Međućelijska supstanca

organski i neorganski deo

- Kolagena vlakna (tip I) 90 - 95%
- Mukopolisaharidi (hondroitin sulfat, keratin sulfat ...) 1 - 2%
- Mineralne soli
  - u obliku hidroksiapatita (85%)
  - CaCO3 (10%) ;
  - kalcijum hlorida i
  - magnezijum sulfat

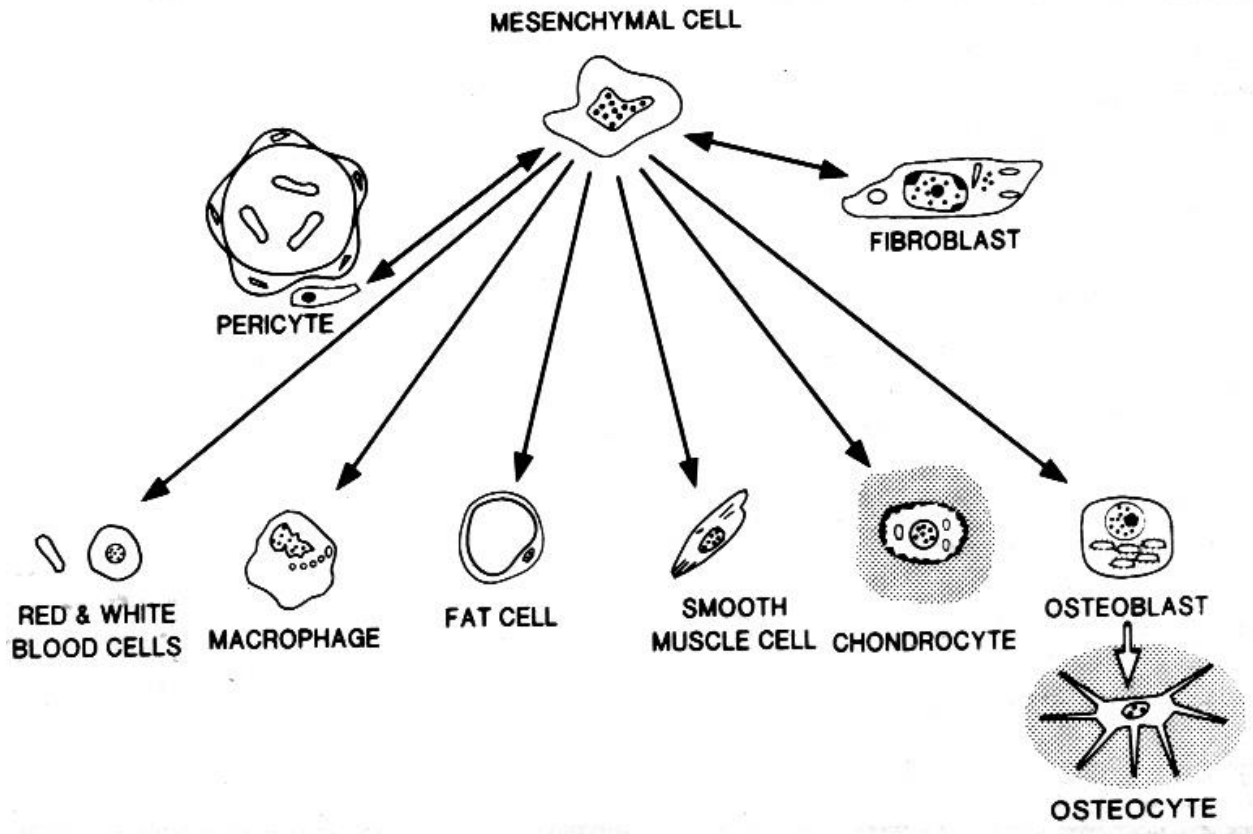


Ćelije

Osteoblasti

Osteociti

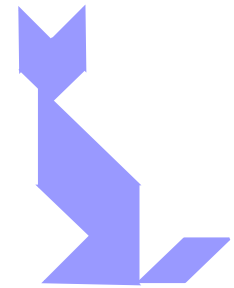
Osteoklasti



Ćelije

- Osteoblasti: anabolička aktivnost;

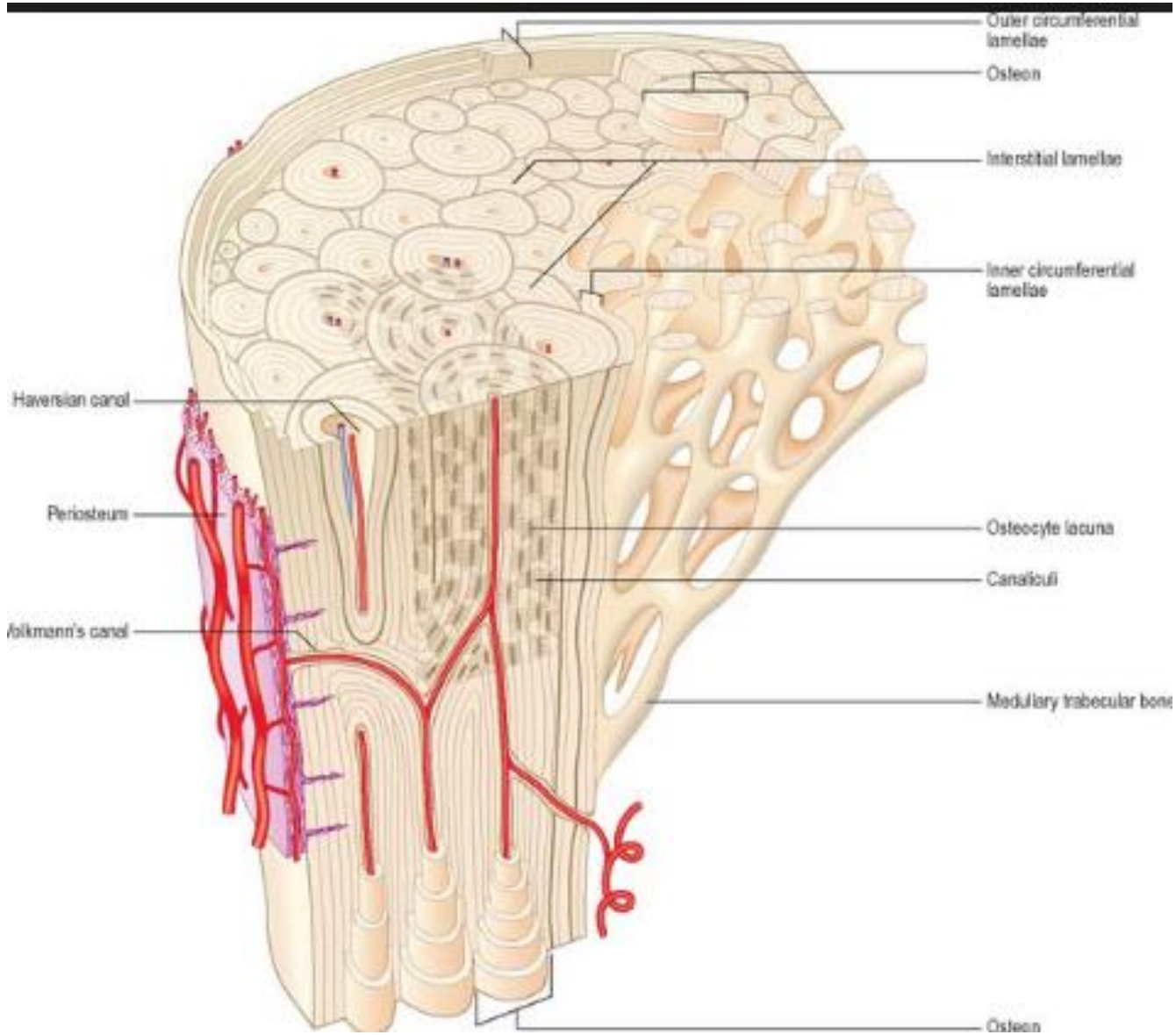
  luče osnovne materije organskog matriksa:
  kolagene fibrile, mukopolisaharide
  alkalnu fosfatazu, osteokalcin, osteonektin i dr.
  učestvuju u održavanju homeostaze jona
- Osteociti
  - održanje homeostaze kalcijuma i fosfora
- Osteoklasti
  - aktivna resorpcija koštanog tkiva (Howship-ove lakune)
  - poreklo: ? monociti

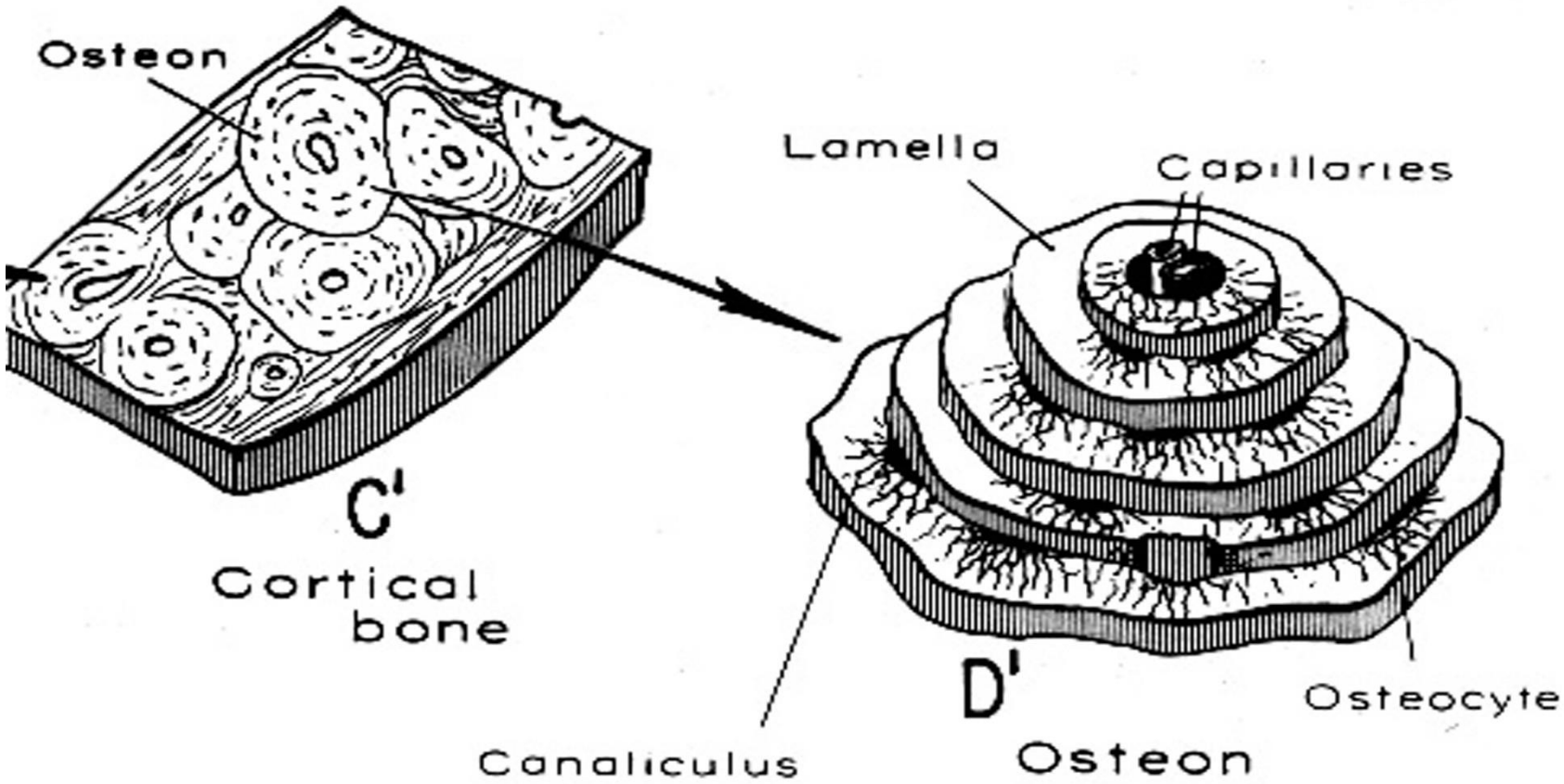


Histološka građa kosti

- A) fibrozna, nelamelarna, grubovlaknasta kost
  (intrauterino; rano detinjstvo; kalus)

- B) lamelarna, zrela kost
  - kortikalna kost osteon (Haversov cilindar):
    - 5 do 20 koncentrično postavljenih lamela sa centralno postavljenim vaskularnim Havers-ovim kanalom.
    - Nutritivni transverzalni Volkman-ovi kanali

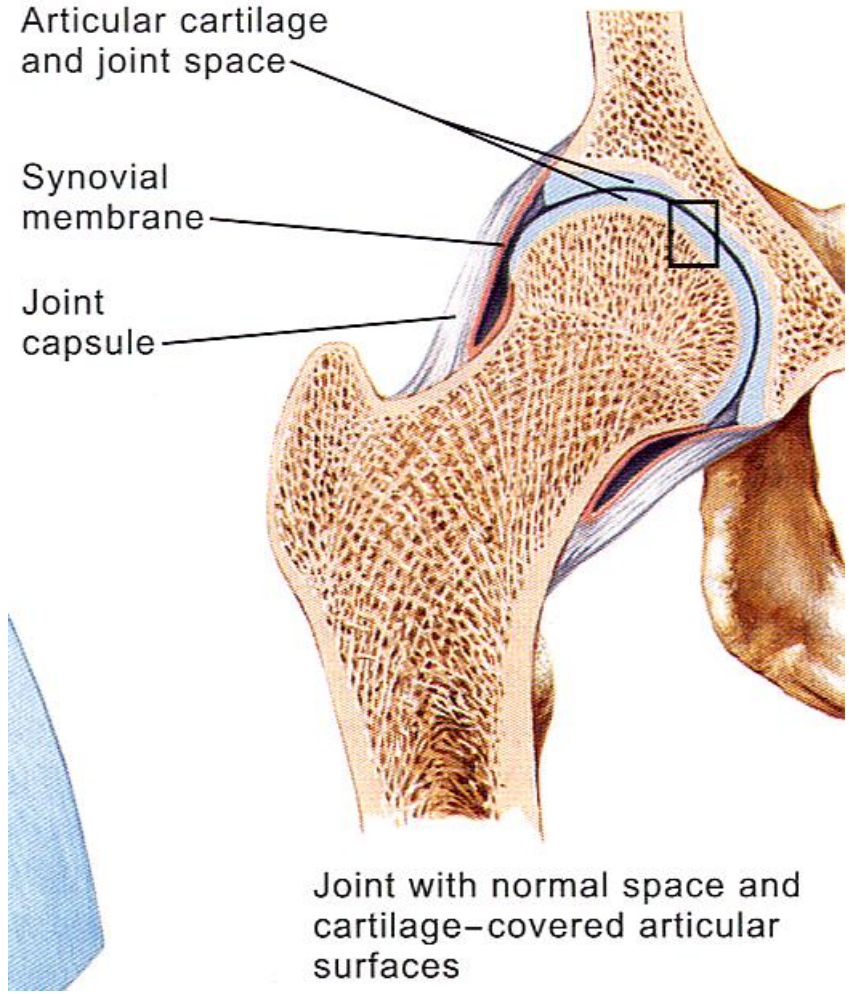

Outer circumferential lamellae
Osteon
Interstitial lamellae
Inner circumferential lamellae
Haversian canal
Periosteum
Volkmann's canal
Osteocyte lacuna
Canaliculi
Medullary trabecular bone
Osteon


Osteon
C'
Cortical
bone
Lamella
Capillaries
D'
Osteocyte
Canaliculus
Osteon

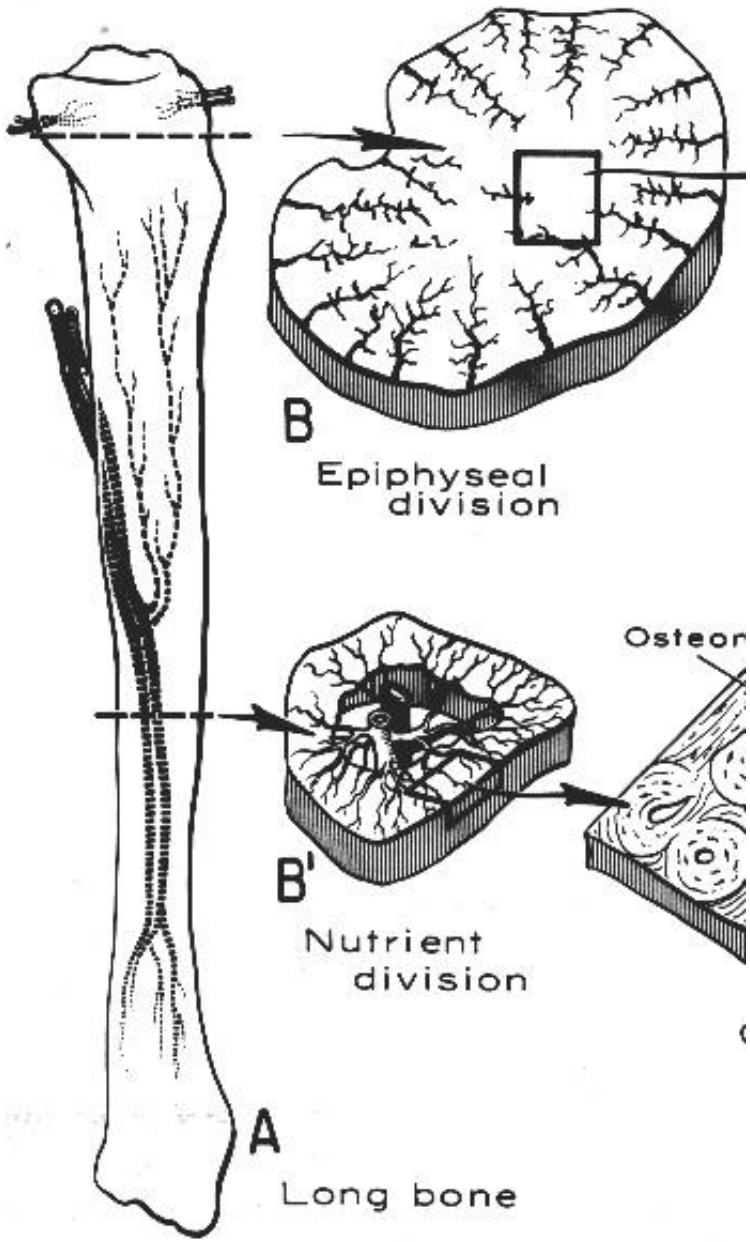
Građa kosti

- kompakta, kortikalna
- spongiozna, trabekularna

U histološkom smislu obe vrsta se sastoje od lamelarne kosti



Joint with normal space and cartilage–covered articular surfaces



Vaskularizacija kosti:

- preko penetrantnih arteriola iz periosta (1/3)
- preko nutritivnih krvnih sudova (1/3) (dijafizne, metafizne i epifizne arterije)

Na osnovu izgleda :

- cevaste ili tubularne: dijafiza, epifiza i metafiza
- kratke kosti (epifizoidne): ručje, koren stopala, prekobrojne kosti
- pljosnate kosti: rebra, sternum, skapula, karlica, većina kostiju lobanje
- druge kosti: kičmeni pršljenovi i dr.

Razvoj koštanog tkiva (osifikacija)

- endesmalno okoštavanje
- enhondralno okoštavanje

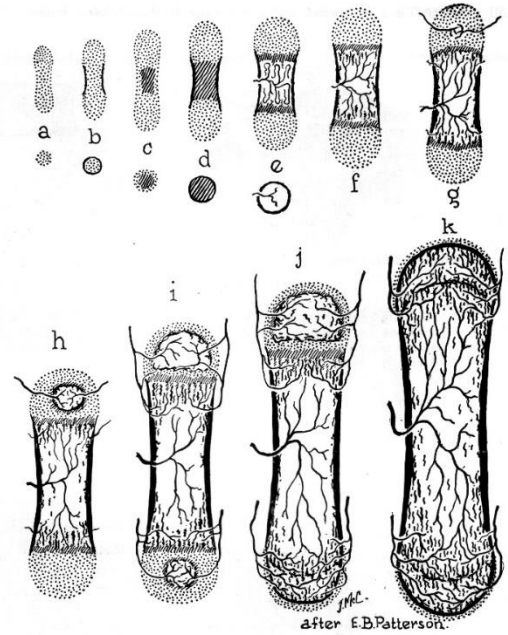


FIGURE 2-41. Development of a typical long bone. (a) Cartilage model. (b) Periosteal bone collar appears. (c) Center of calcifying cartilage. (d) Further development of calcified cartilage. (e) Vascular mesenchyme enters, resorbs calcified cartilage, and new bone is laid down toward either extremity of the model. (f) Endochondral ossification is further advanced and bone increased in length. (g) Blood vessels and mesenchyme enter upper epiphyseal cartilage. (h) Development of epiphyseal ossification center. (i) Ossification center develops in lower epiphysis. (j and k) The lower and then the upper epiphyseal cartilage plates disappear, bone ceases to grow in length, a continuous bone marrow cavity traverses the entire length of the bone, and blood vessels of diaphysis, metaphysis, and epiphysis intercommunicate. (Adapted from Maximow AA, Bloom W. Textbook of histology. Philadelphia, WB Saunders, 1968)

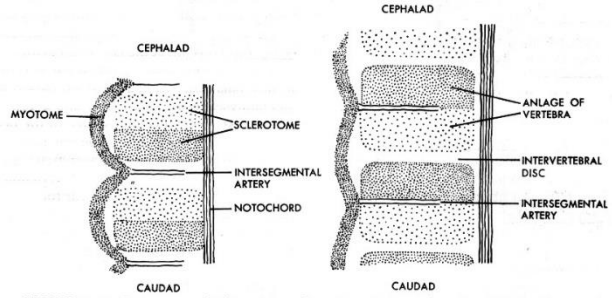
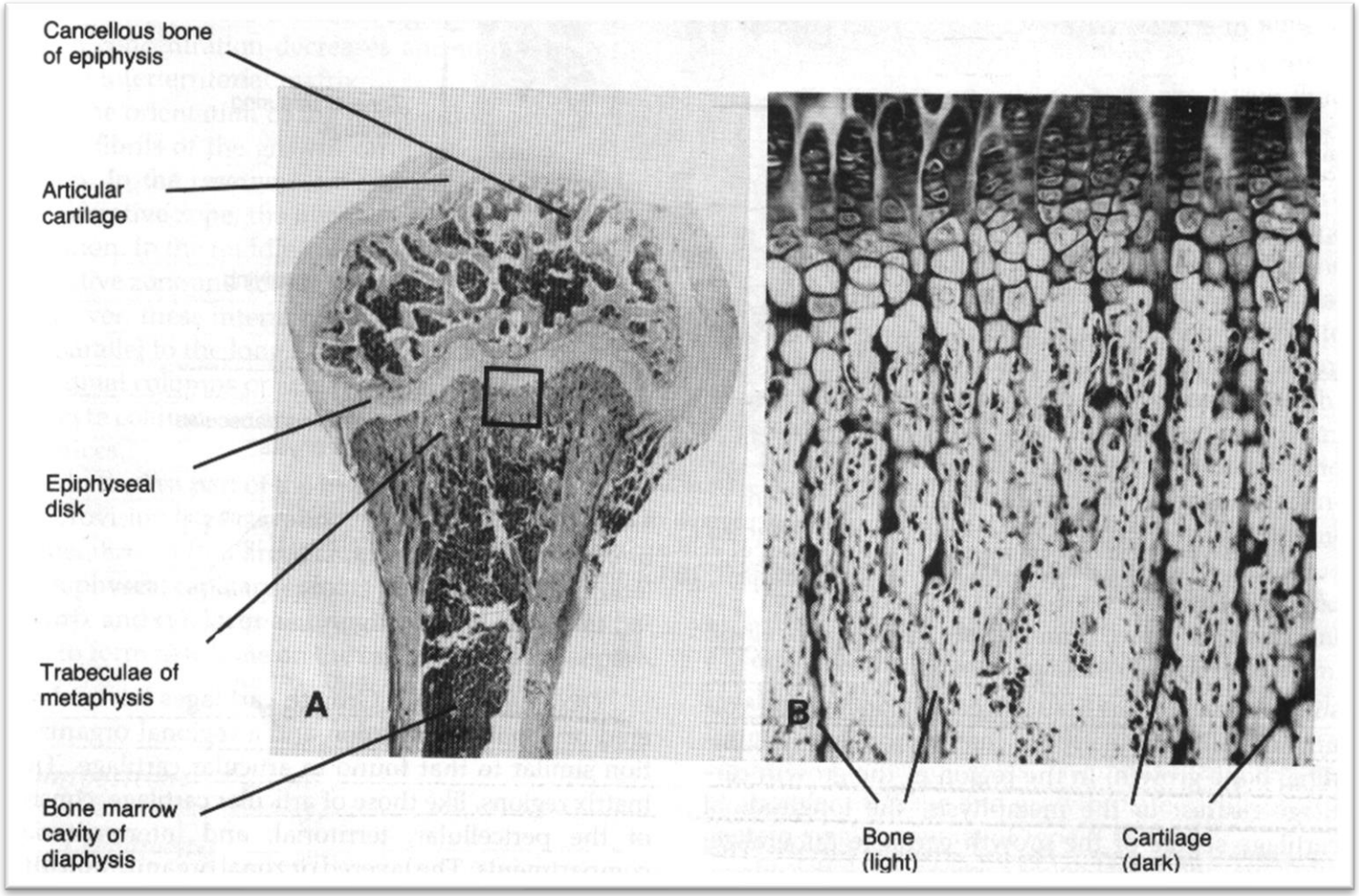


FIGURE 2-42. Early stages of differentiation of vertebrae. (Adapted from Arey LB. Developmental anatomy. Philadelphia, WB Saunders, 1974)

Hrskavica rasta



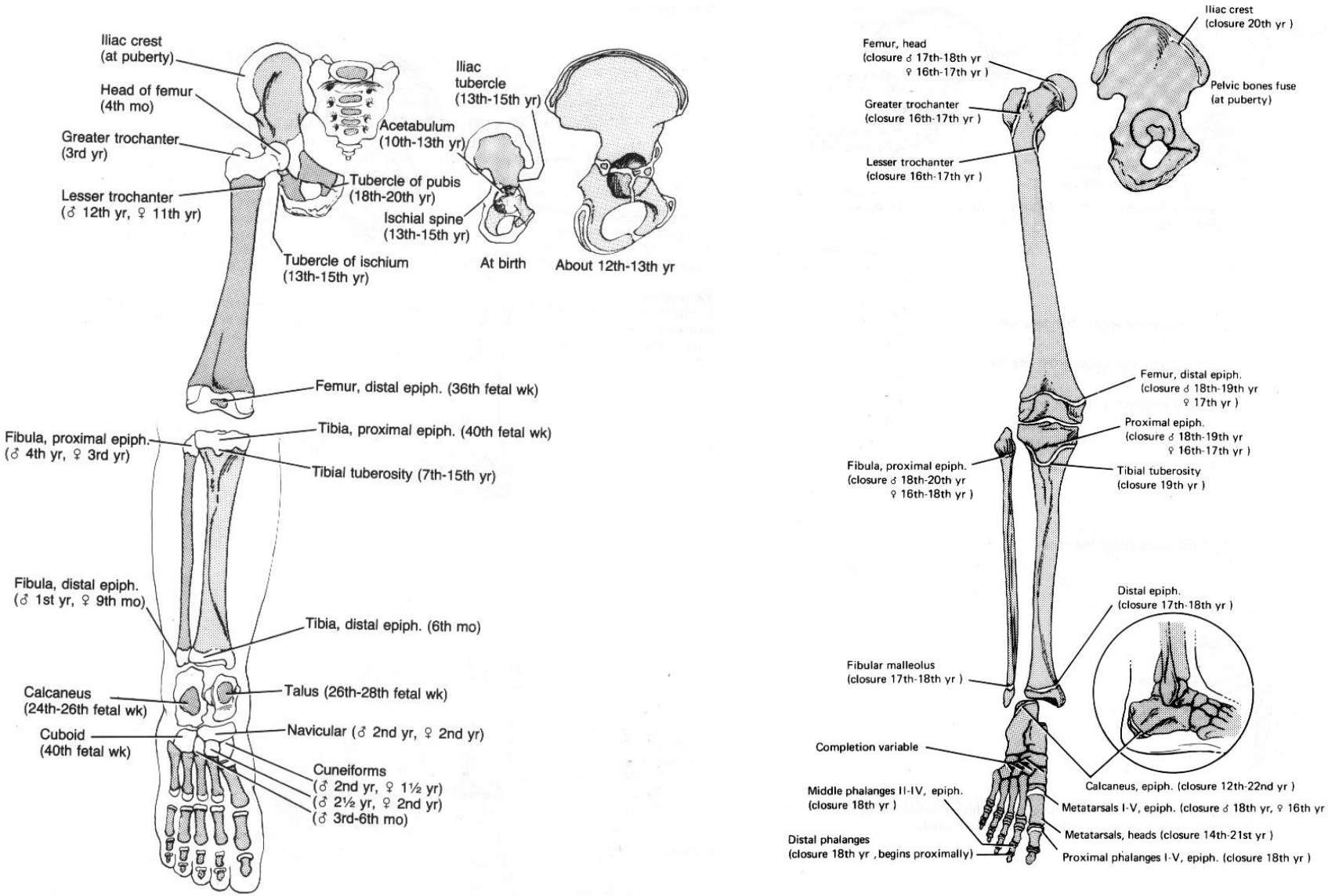
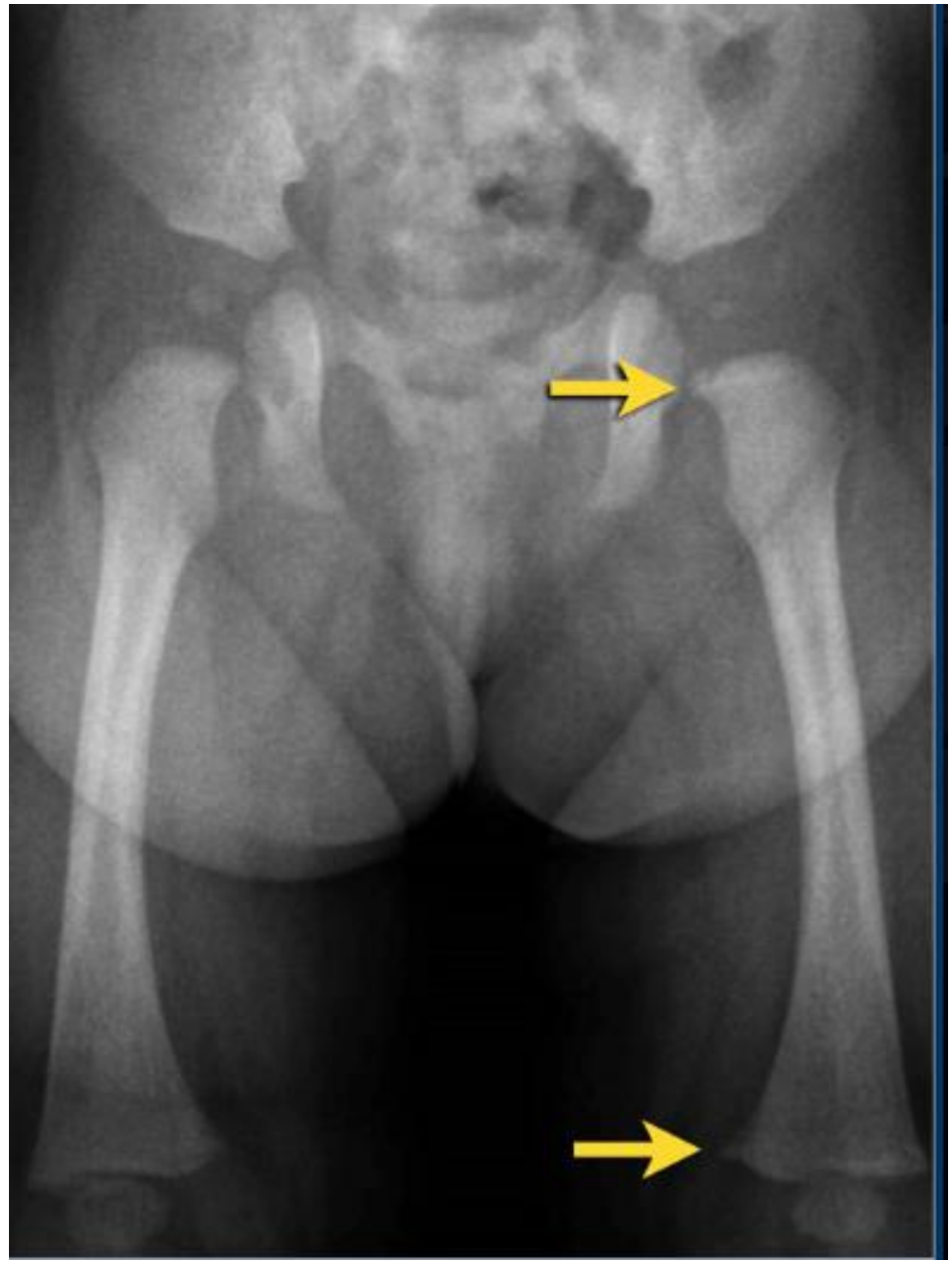
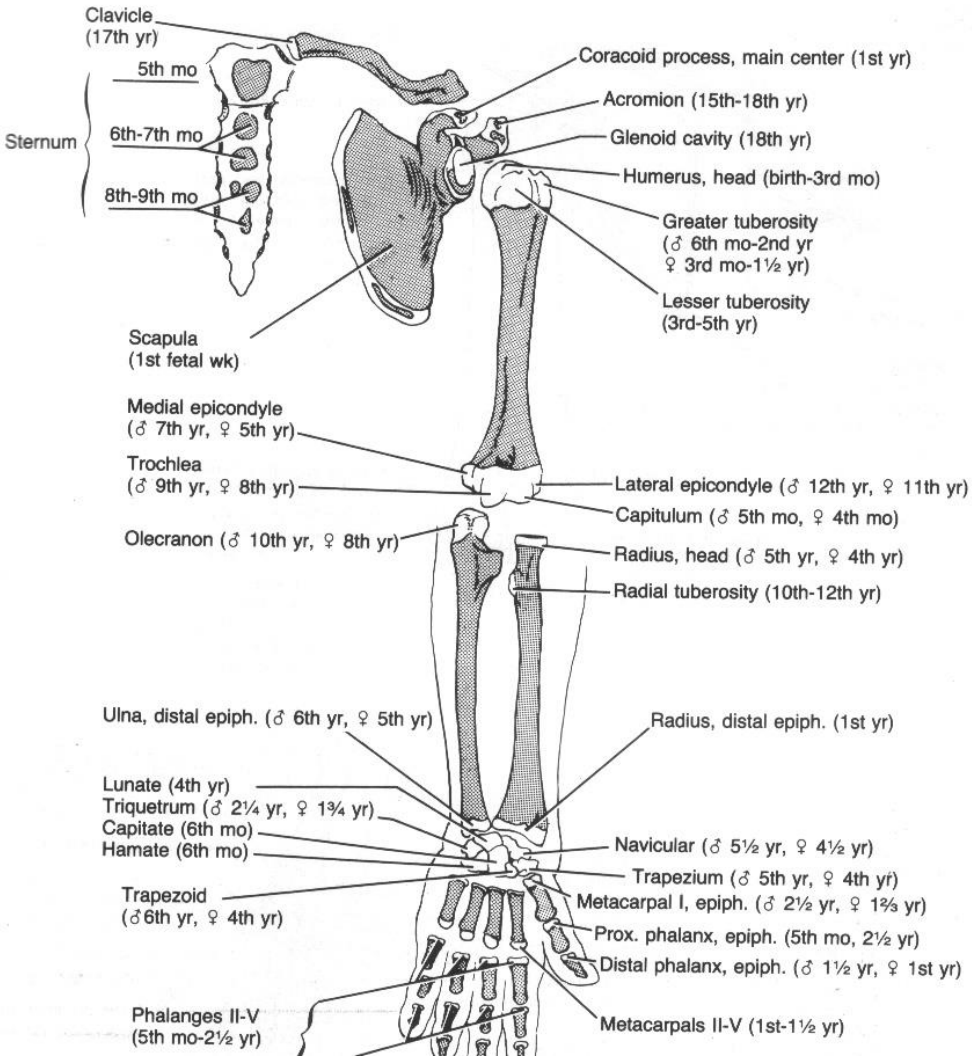
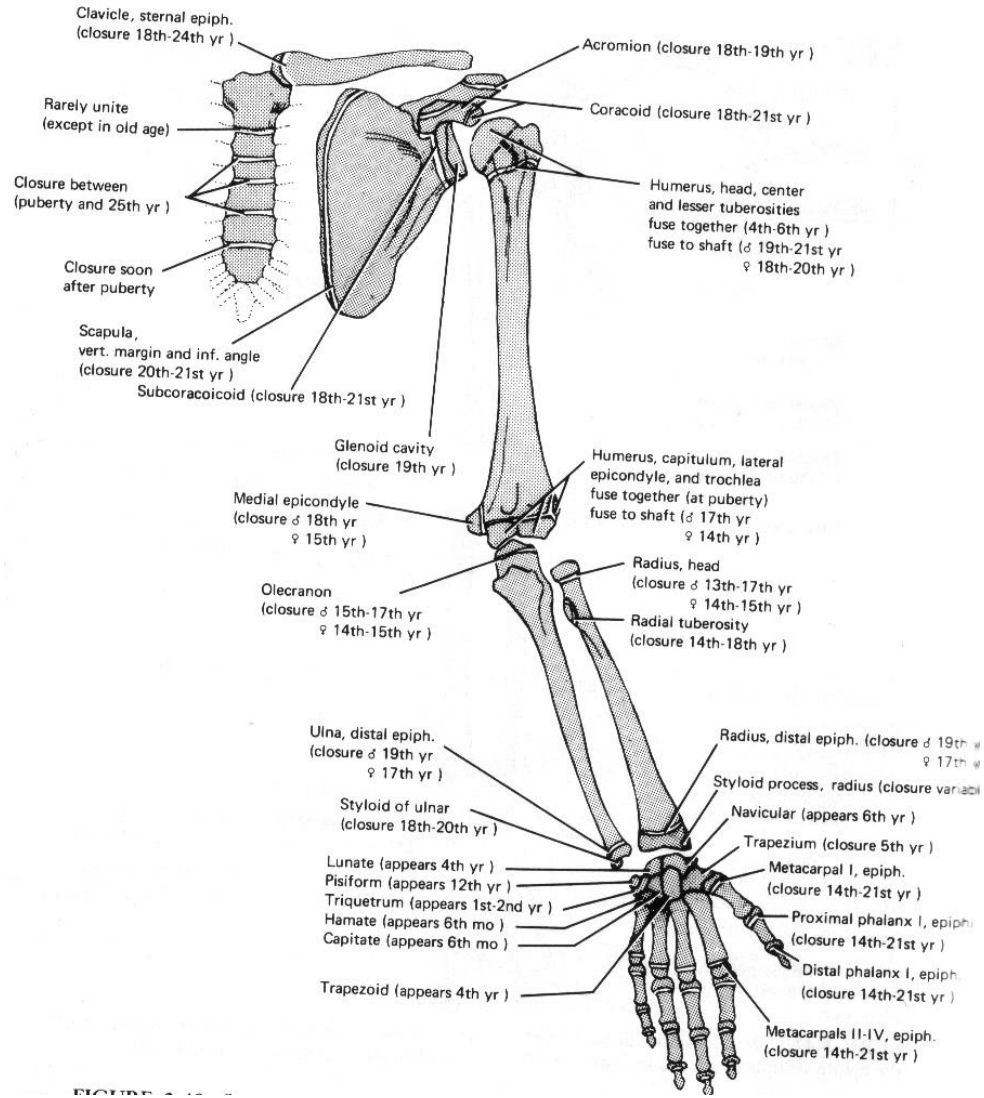


FIGURE 2-50. The stage of advancing ossification and epiphyseal closure of the lower extremity.




Clavicle (17th yr)
Sternum
5th mo
6th-7th mo
8th-9th mo
Coracoid process, main center (1st yr)
Acromion (15th-18th yr)
Glenoid cavity (18th yr)
Humerus, head (birth-3rd mo)
Greater tuberosity (♂ 6th mo-2nd yr ♀ 3rd mo-1½ yr)
Lesser tuberosity (3rd-5th yr)
Scapula (1st fetal wk)
Medial epicondyle (♂ 7th yr, ♀ 5th yr)
Trochlea (♂ 9th yr, ♀ 8th yr)
Lateral epicondyle (♂ 12th yr, ♀ 11th yr)
Capitulum (♂ 5th mo, ♀ 4th mo)
Olecranon (♂ 10th yr, ♀ 8th yr)
Radius, head (♂ 5th yr, ♀ 4th yr)
Radial tuberosity (10th-12th yr)
Ulna, distal epiph. (♂ 6th yr, ♀ 5th yr)
Radius, distal epiph. (1st yr)
Lunate (4th yr)
Triquetrum (♂ 2¼ yr, ♀ 1¾ yr)
Capitate (6th mo)
Hamate (6th mo)
Navicular (♂ 5½ yr, ♀ 4½ yr)
Trapezium (♂ 5th yr, ♀ 4th yr)
Trapezoid (♂6th yr, ♀ 4th yr)
Metacarpal I, epiph. (♂ 2½ yr, ♀ 1⅔ yr)
Prox. phalanx, epiph. (5th mo, 2½ yr)
Distal phalanx, epiph. (♂ 1½ yr, ♀ 1st yr)
Phalanges II-V (5th mo-2½ yr)
Metacarpals II-V (1st-1½ yr)


Clavicle, sternal epiph. (closure 18th-24th yr)
Acromion (closure 18th-19th yr)
Rarely unite (except in old age)
Coracoid (closure 18th-21st yr)
Closure between (puberty and 25th yr)
Humerus, head, center and lesser tuberosities fuse together (4th-6th yr) fuse to shaft (♂ 19th-21st yr ♀ 18th-20th yr)
Closure soon after puberty
Scapula, vert. margin and inf. angle (closure 20th-21st yr)
Subcoracoicoid (closure 18th-21st yr)
Glenoid cavity (closure 19th yr)
Humerus, capitulum, lateral epicondyle, and trochlea fuse together (at puberty) fuse to shaft (♂ 17th yr ♀ 14th yr)
Medial epicondyle (closure ♂ 18th yr ♀ 15th yr)
Radius, head (closure ♂ 13th-17th yr ♀ 14th-15th yr)
Olecranon (closure ♂ 15th-17th yr ♀ 14th-15th yr)
Radial tuberosity (closure 14th-18th yr)
Ulna, distal epiph. (closure ♂ 19th yr ♀ 17th yr)
Radius, distal epiph. (closure ♂ 19th ♀ 17th
Styloid process, radius (closure
Styloid of ulnar (closure 18th-20th yr)
Navicular (appears 6th yr)
Trapezium (closure 5th yr)
Lunate (appears 4th yr)
Pisiform (appears 12th yr)
Triquetrum (appears 1st-2nd yr)
Hamate (appears 6th mo)
Capitate (appears 6th mo)
Metacarpal I, epiph. (closure 14th-21st yr)
Proximal phalanx I, epiph. (closure 14th-21st yr)
Distal phalanx I, epiph. (closure 14th-21st yr)
Trapezoid (appears 4th yr)
Metacarpals II-IV, epiph. (closure 14th-21st yr)


E
C
I
T
R
I
C
R
O
C-R-I-T-O-E
1- 3-5-7-9-11

Hvala na pažnji