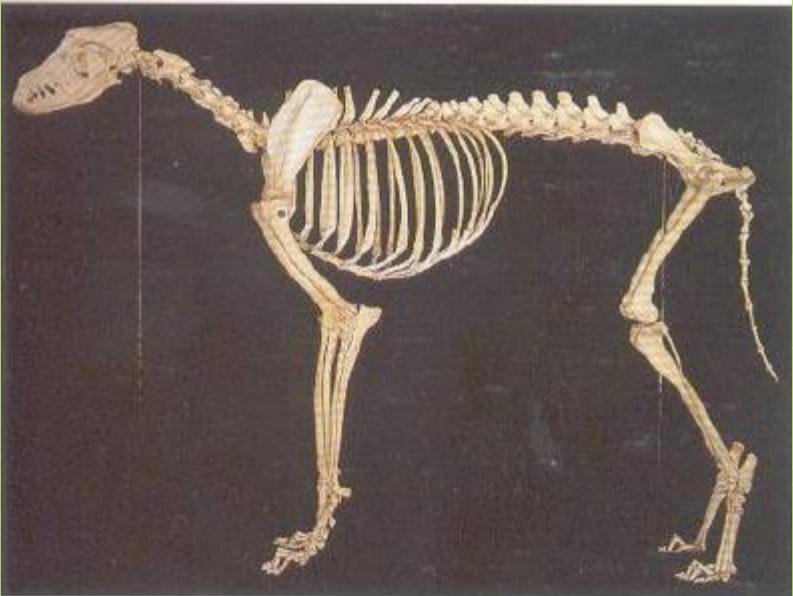
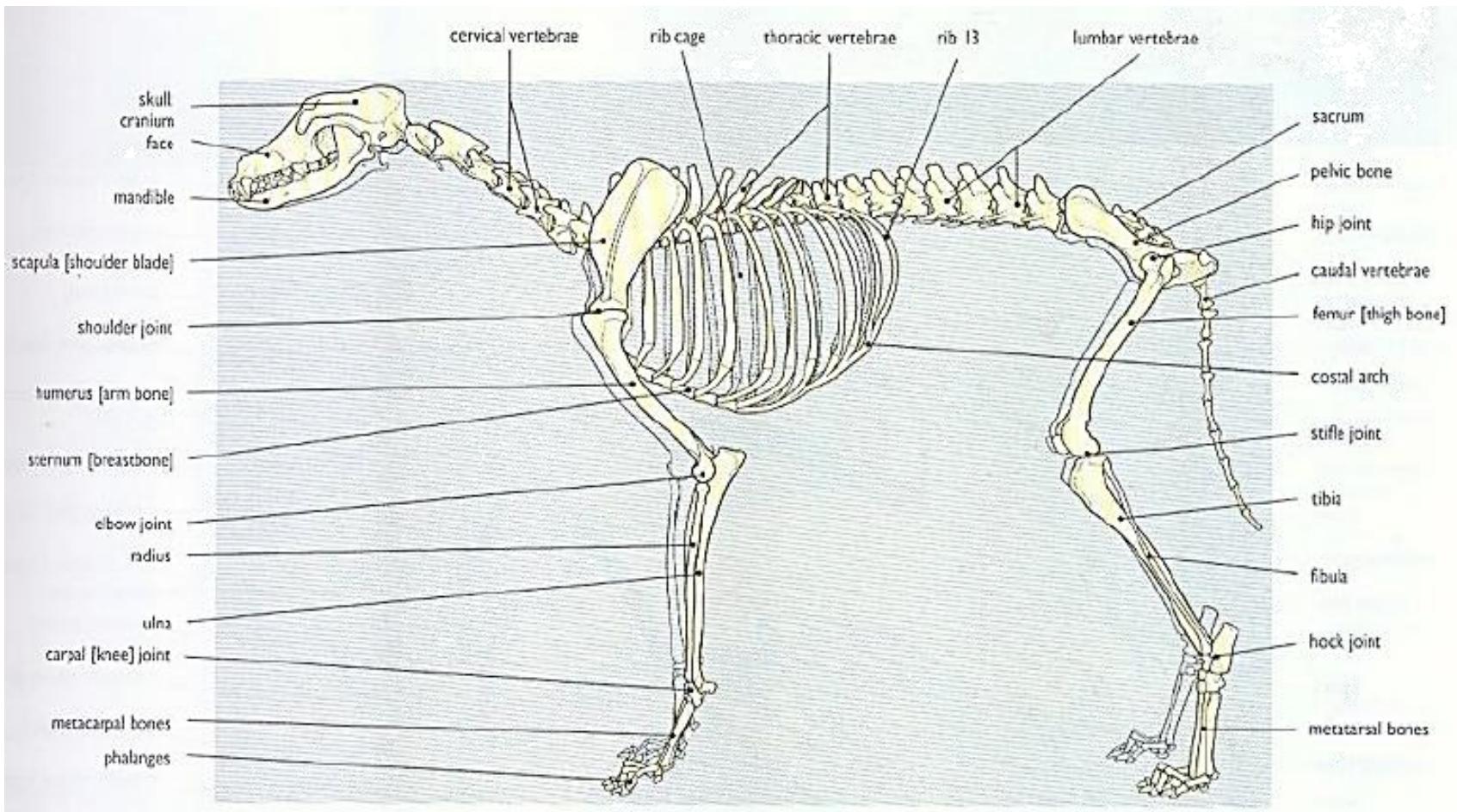


CARNIVOR-1

(Osteology)



Anatomi Veteriner Makro-3
Program Kedokteran Hewan
Universitas Brawijaya
2017



SKELETON AXIALIS

Ossa
Craniofascialis

Ossa Cranii

Ossa Fasciei

Columna
Vertebrae

V. Cervicalis

V. Thoracalis

V. Lumbalis

V. Sacralis

V. Coxygealis

Thorax

Ossa Costae

Ossa Sternum

Skeleton Appendicularis

Ossa Membri
Thoracici

Regio Cingulum Membri Thoracici (scapula,
Clavicula, Coracoideus)

Regio Brachii (Humerus)

Rego Antebrachii (Radius & Ulna)

Regio Manus (Carpi, Metacarpi,
Digitii)

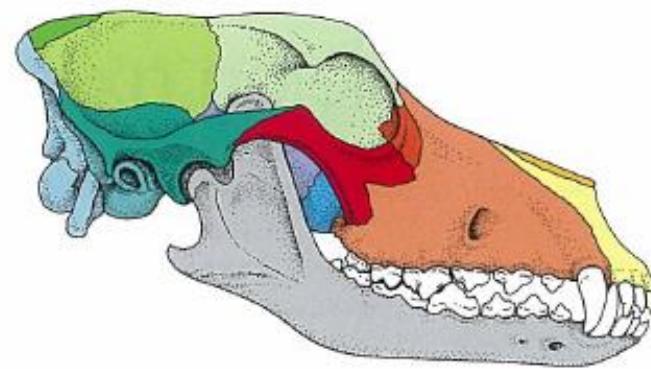
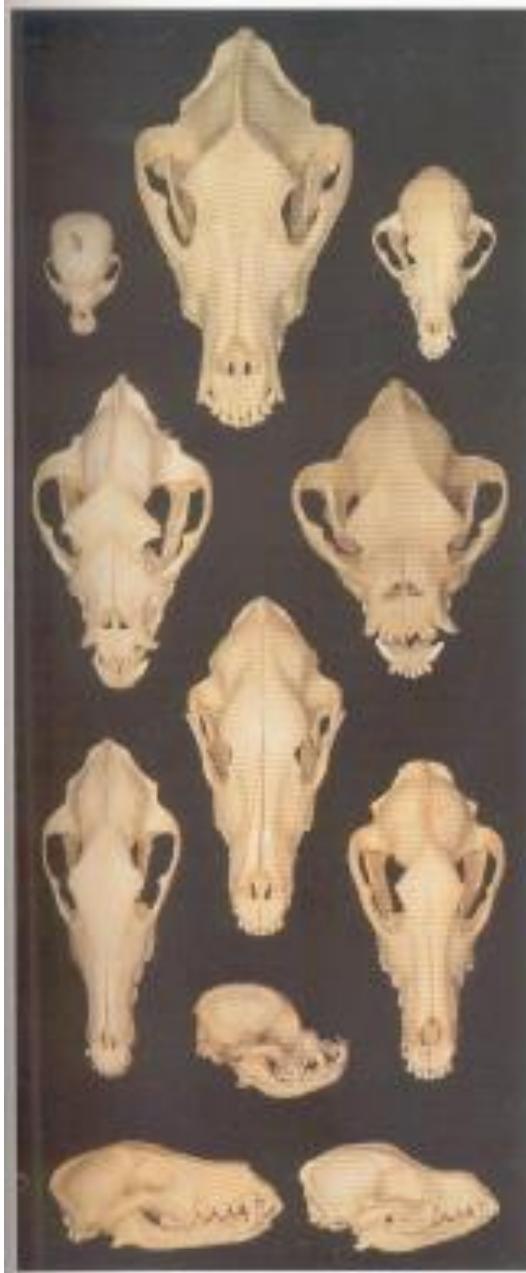
Regio Cingulum membra Pelvini (Coxae)

Regio
Femuralis

Regio Cruris (Tibia &
Fibula)

Ossa Membri
Pelvini

Regio Pedis (Tarsi, Metatarsi, Digitii)



Dog



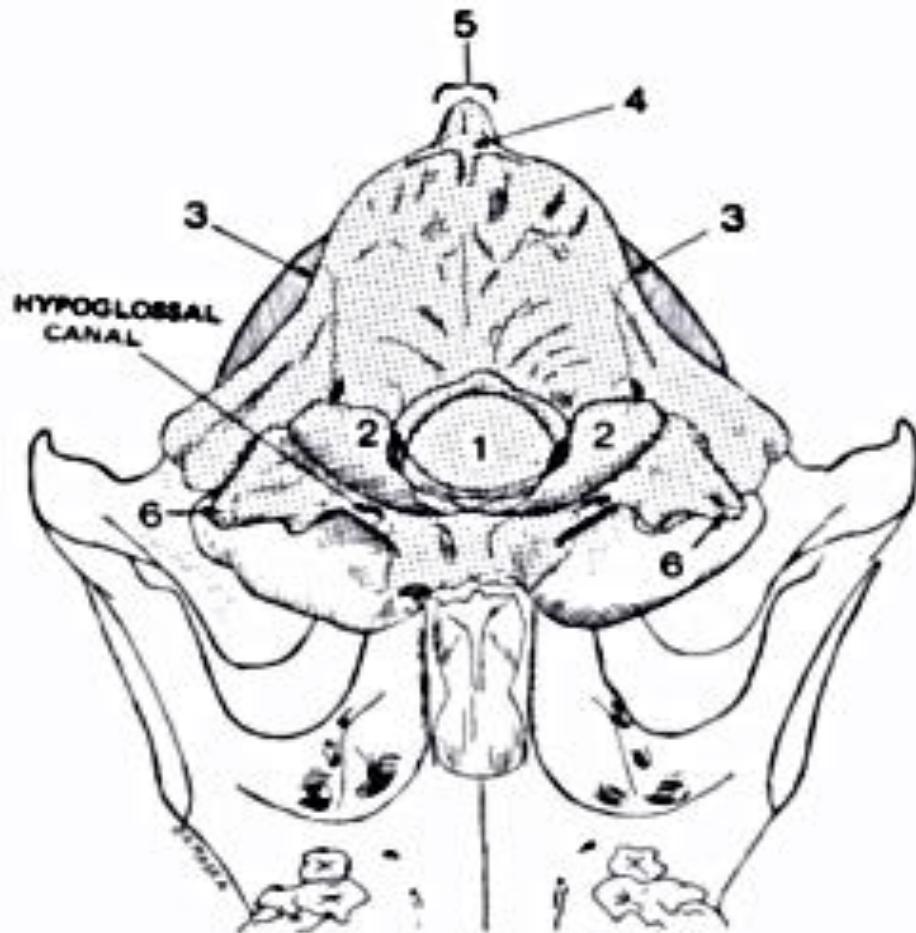
CRANIOFACIALIS

A. Ossa Cranii

Tunggal	Ganda
-Occipitale	-Frontale
-Sphenoidale	-Parietale
-Ethmoidale	-Temporale
-interparietale	

- Occipitalis
 - Anjing : Proc. Paramastoideus pendek
 - Kucing: Bagian internal ossa occipital terdapat: **Protuberansia occipitalis dan Impressio vermialis**

Os occipital anjing caudo ventral



1. Osoccipitale
2. Foramen magnum
3. Crista nuchae
4. Eksternal occipital protuberance
5. Processus interpariental
6. Proceccus jugularis

○ OsSphenoidale

- Corpus (1)
- Alae (2)

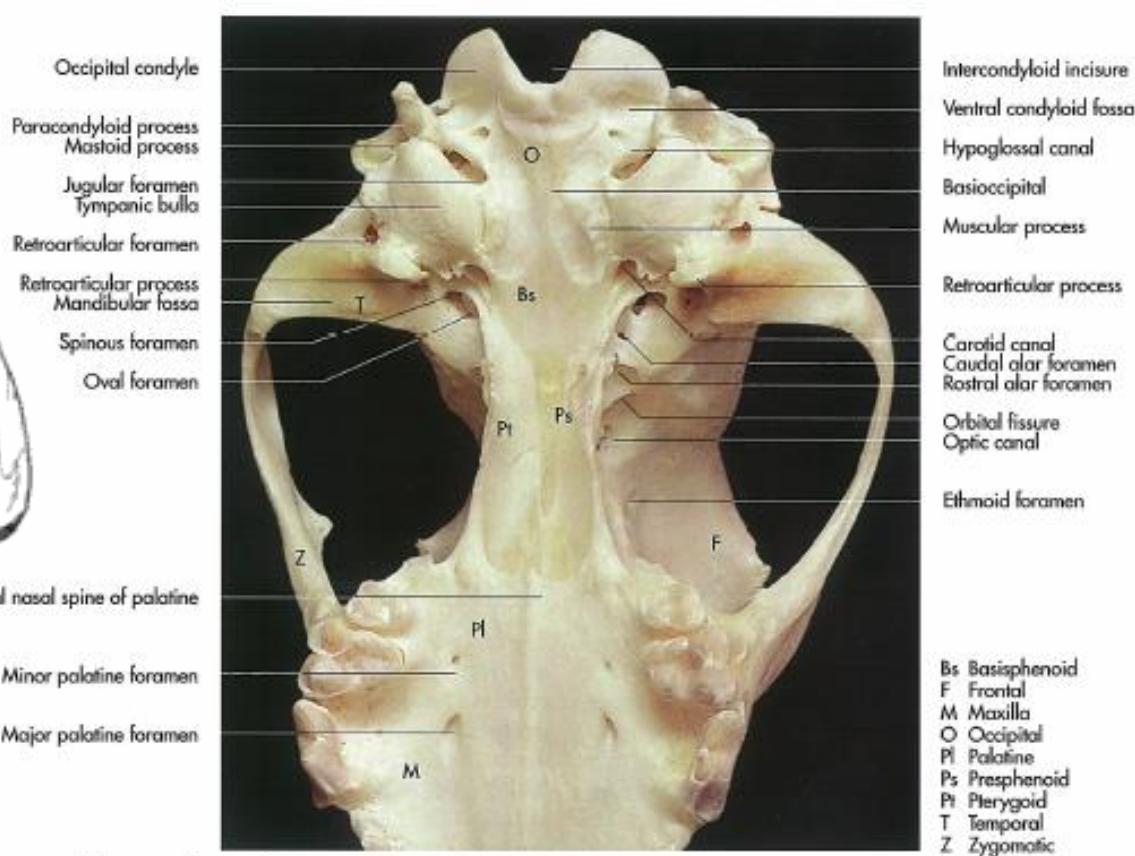
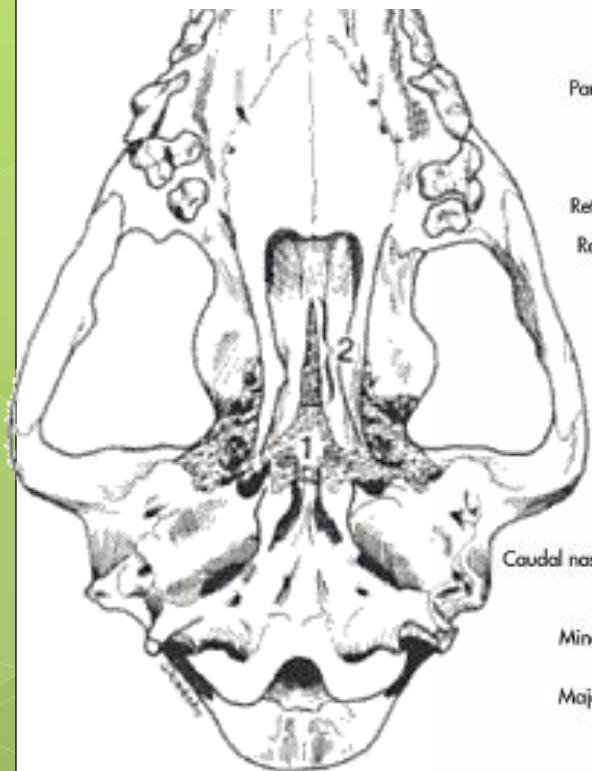
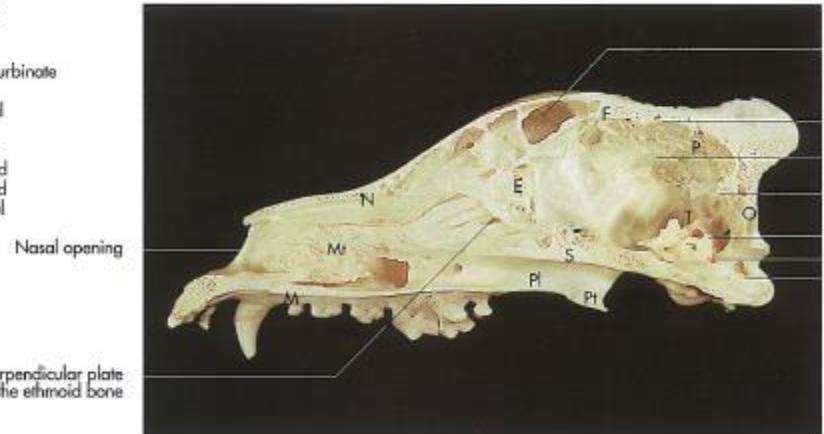


Fig. 1-6. Bones of the cranial part of a canine skull (ventral aspect).

○ Os Ethmoidale

- Lamina cribosa
- Pars perpendicularis
- Labyrinthus

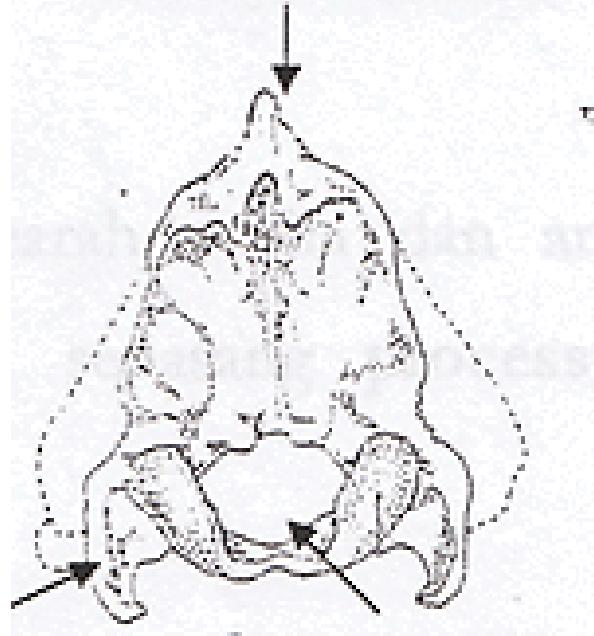
E Ethmoid
F Frontal
M Maxilla
Mt Maxilloturbinate
N Nasal
O Occipital
P Parietal
Pl Palatine
Pt Pterygoid
S Sphenoid
T Temporal



○ Os Interparietale

- Merupakan tulang relatif kecil, posisinya di puncak kuduk.
- Anjing: terbentuk taju **processus interparietale** di puncak caudal tulang

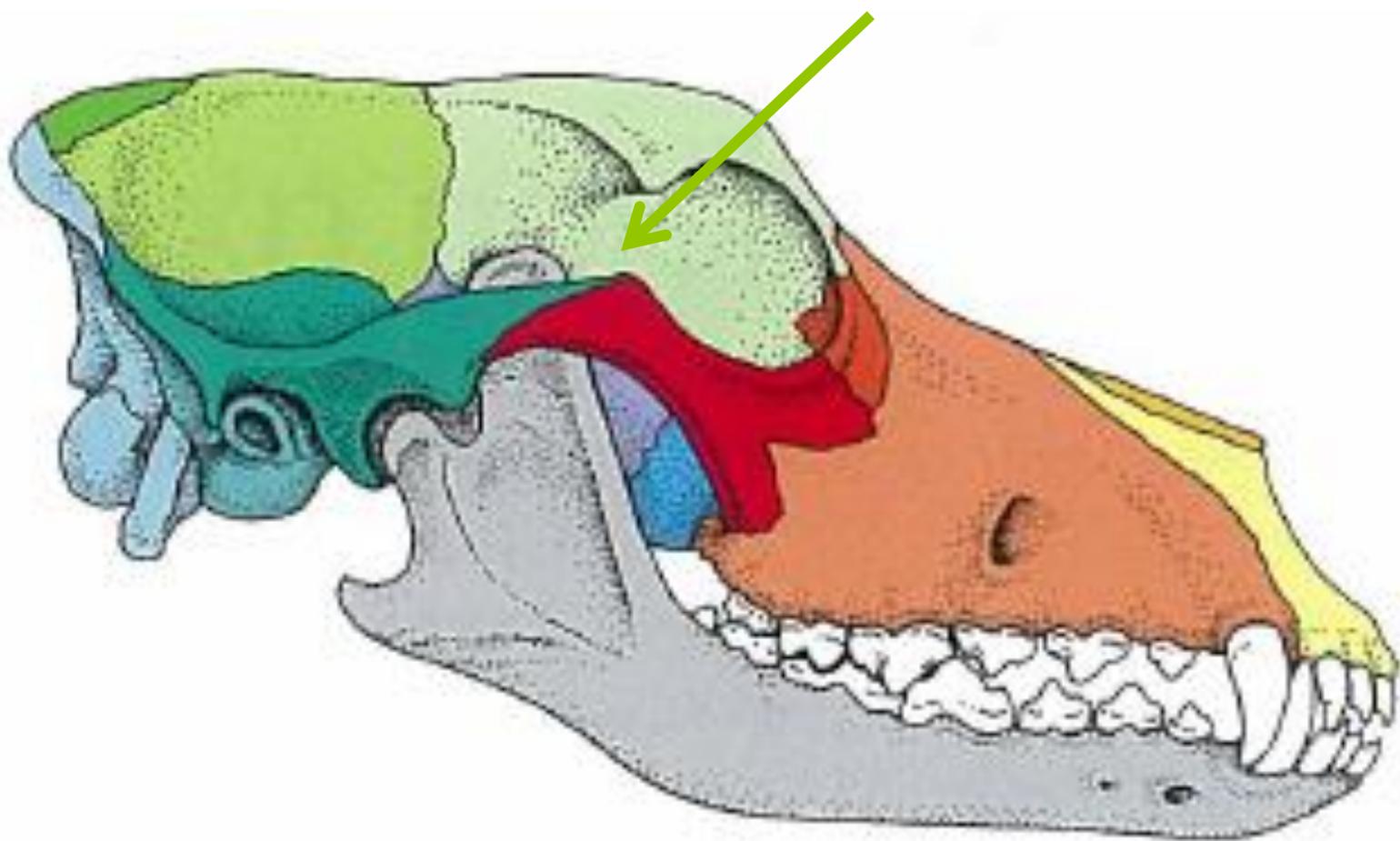
Crista sagitalis externa
Processus interparietale



○ Os Frontale

- Pars Nasalis
- Pars temporalis
- Pars orbitalis
- Facies exsterna
- Facies cerebralis
- Anjing:
 - Proc. Supraorbitalis pendek, tidak ada for. Supraorbitalis
 - Arcus zygomaticus yang vertical tidak tumbuh, karena os frontal berakhir pada orbitalis

Arcus Zygomaticus
vertical tidak tumbuh



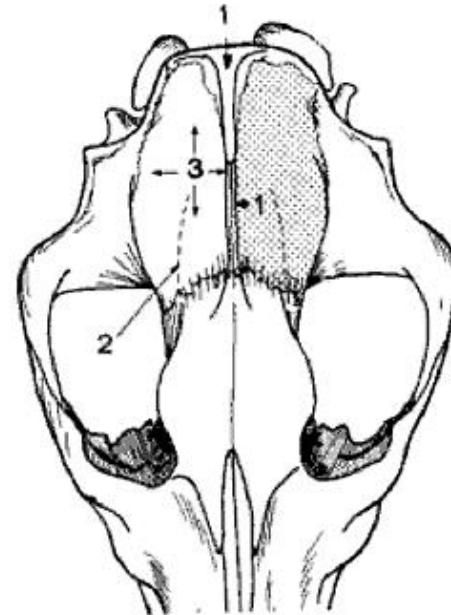
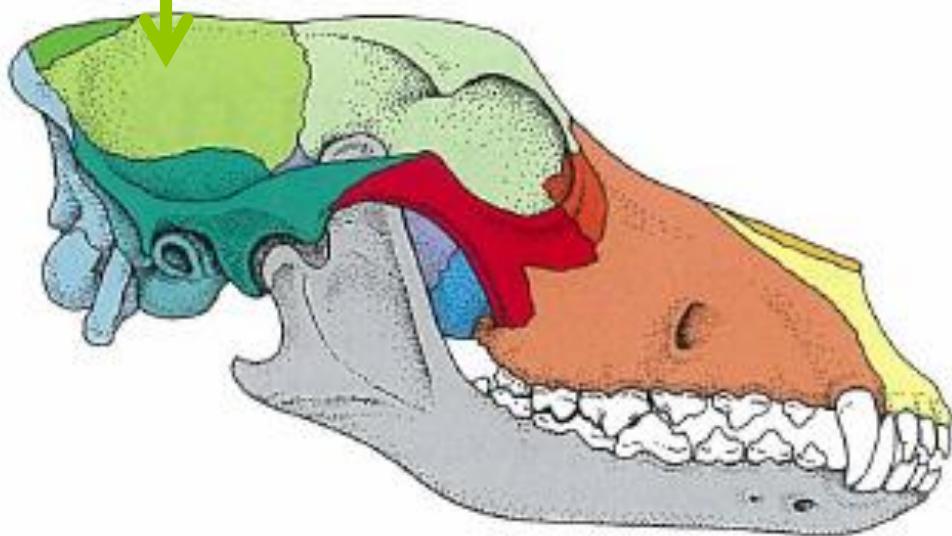
○ Os Parientale

○ Faciesparientalis

Pada anjing, sebagian besar pelipis disusun oleh tulang parietale.

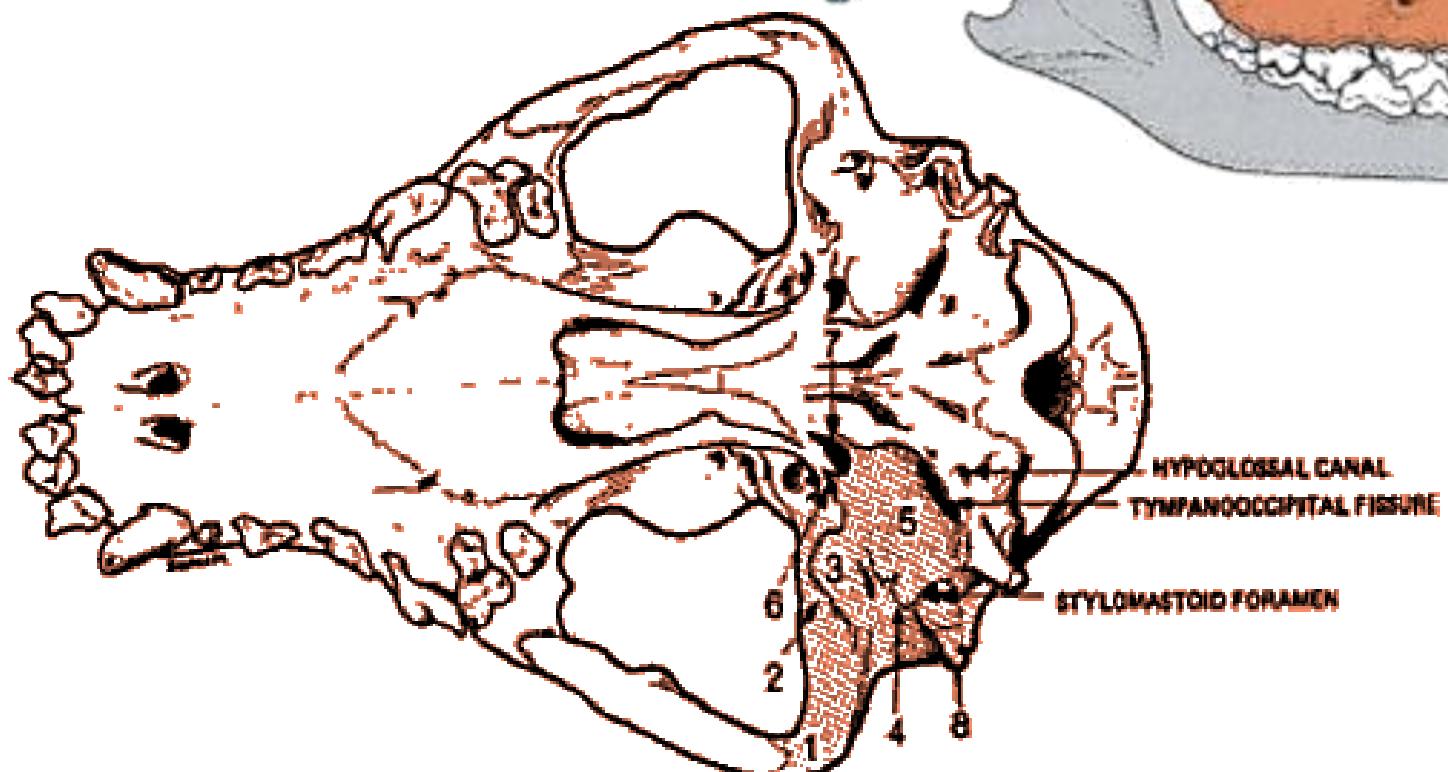
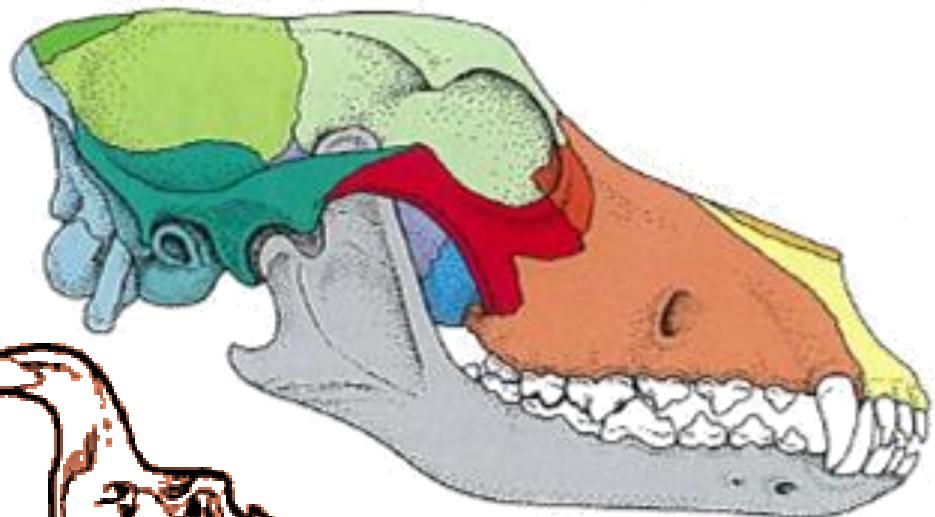
○ Faciescerebralis

Ada **Impresiones digitatae** (legokan di permukaan dalam membentuk cavum crani)



○ Os Temporale

- Pars squamosal
- Pars tympanicus
- Pars mastoideus

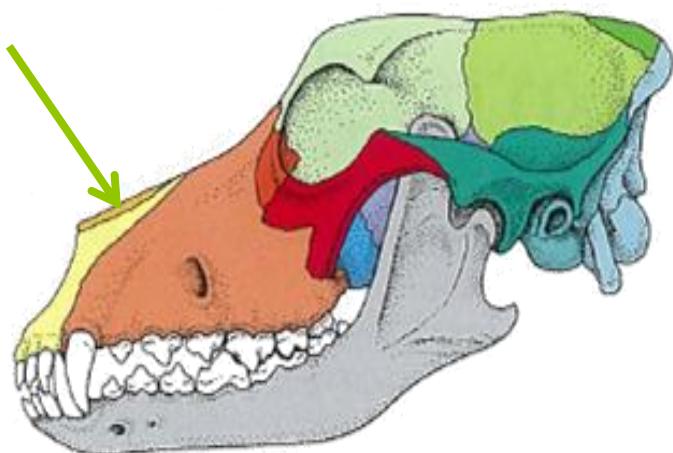


B. OSSA FACIALIS

Tunggal	Ganda
Palatine	-Nasale
Vomer	-Maxillae
Mandibulare	-Malare
Hyoideus	-Lacrimale -Premaxilae -Pterygoideus -Turbinatum

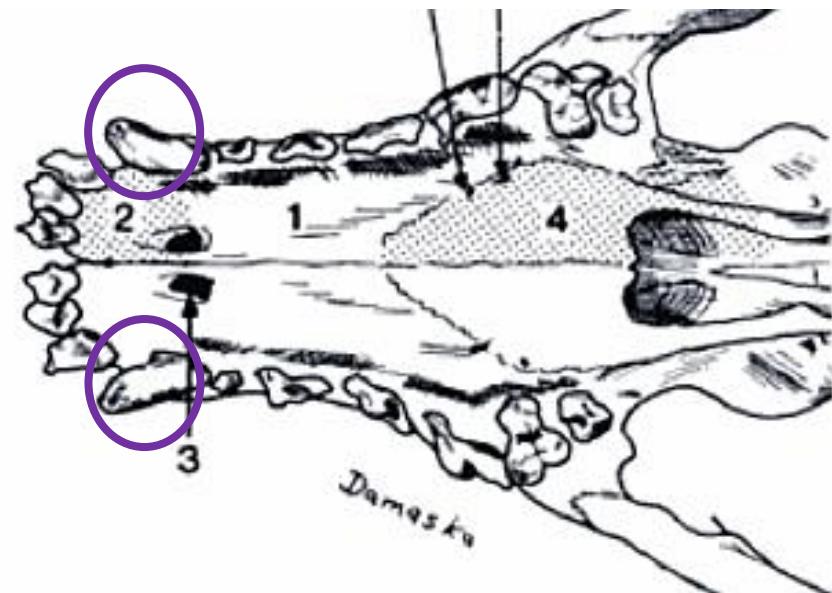
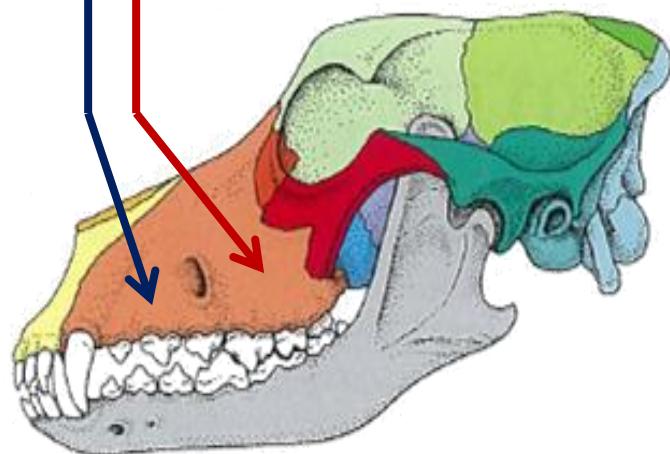
○ Os Nasale

- Facies externa/facialis
- Facies interna/nasalis



○ Os Maxillae

- Corpus
- Facies Interna/Nasalis
- Anjing:
 - Tidak memiliki crista facialis atau tuber facialis.
 - di depan Foramen Infraorbitalis ada fossa caninus
 - os maxillae juga ditumbuhi oleh gigi caninus,



- **Os Lacrimale**

- Facies facialis
- Facies orbitalis
- Facies nasalis

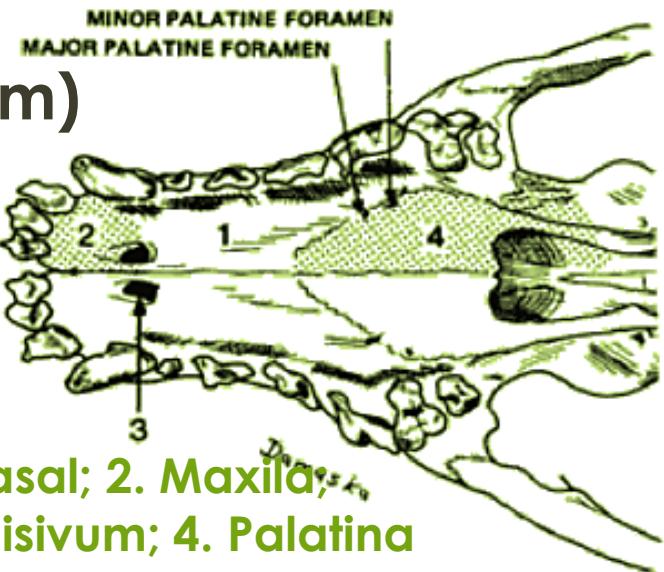
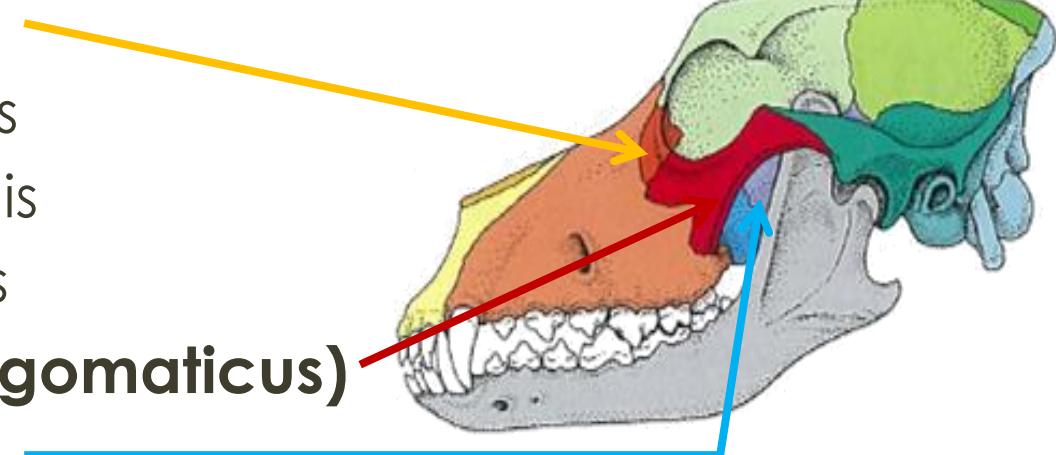
- **Os Malare (Zygomaticus)**

- **Os Palatinum**

- Pars horizontalis
- Pars perpendicularis

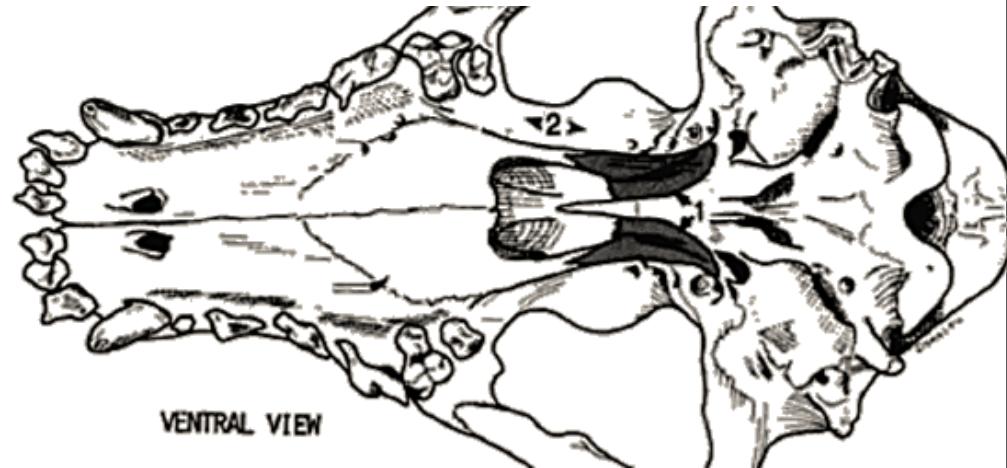
- **Os Premaxillae (Os Incisivum)**

- Foramen Incisivum Alveoli
- Proc. Nasalis
- Proc. Palatinus



- **Os Pterygoideus**

- Hamulus
Pterygoideus



- **Os Turbinatum
(Conchae**

- **nasalis)**

- Concha nasalis
dorsalis

E Ethmoid
F Frontal
I Incisive
N Nasal
Pl Palatine
S Sphenoid
V Vomer

- Concha nasalis
ventralis

Middle nasal conchae
Ventral nasal conchae
Nasal opening

- Concha nasalis
media

-Meatus nasi dorsalis

-Meatus nasi
communis

-Meatus nasi medius

- Septum nasi

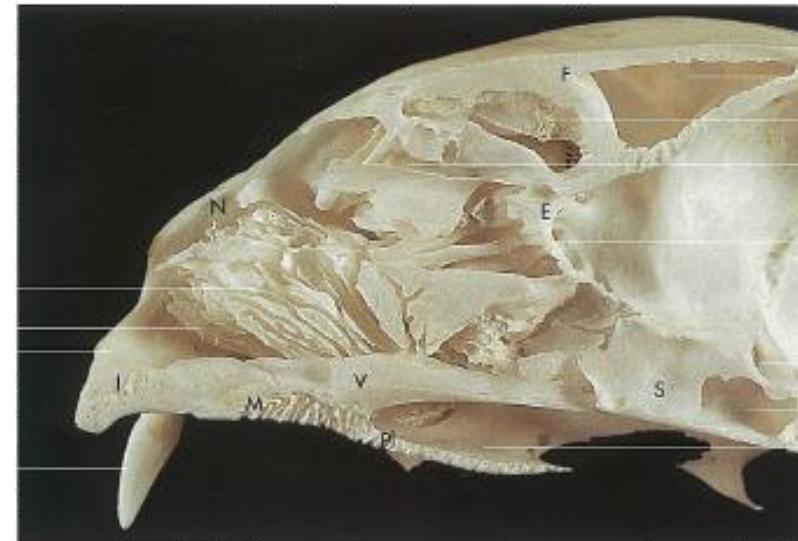


Fig. 1-56. Skull of a cat (median aspect of paramedian section).

Frontal sinus

Ectoturbinete II

Dorsal nasal conchae

Cribriform plate
of the ethmoid bone

Optic canal

Sphenoid sinus

Nasopharyngeal meatus

○ Os Vomer

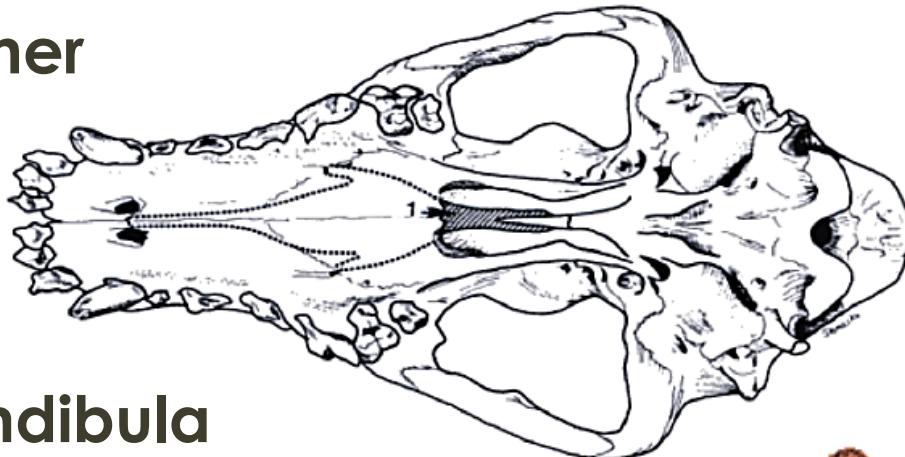


Fig.6.15. Vomer, ventral view.

○ Os Mandibula

- Corpus
- Rami mandibular
- Anjing:
 - Terdapat Processus angularis pada angulus mandibulae
 - Fossa masseterica terlihat dalam dan kuat

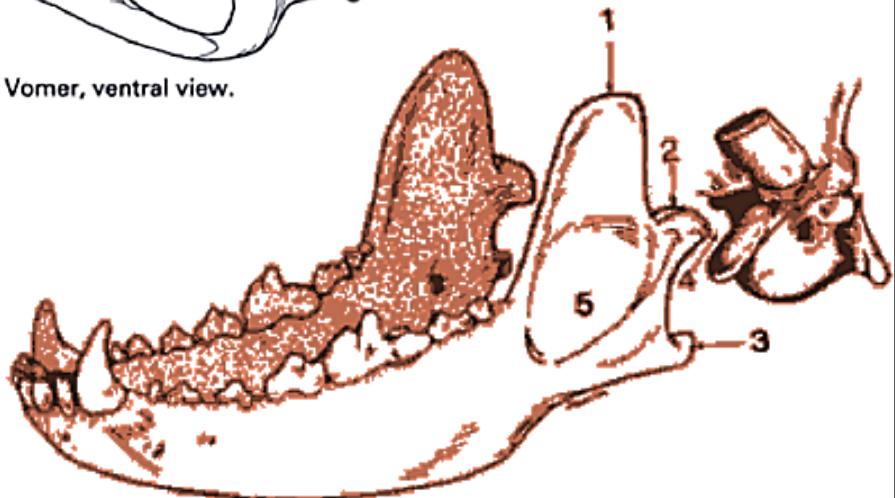


Fig.6.19. Mandibles, dorsolateral view.

- 1. Processus coronoideus; 2. Processus condylaris;
- 3. Processus Angularis; 4. Articulatio Temporo-mandibular; 5. Fossa Masseterica

○ Os Hyoideum

1. **Basihyoid**
2. **Thyrohyoid**
3. **Ceratohyoid**
4. **Epihyoid**
5. **Stylohyoid**

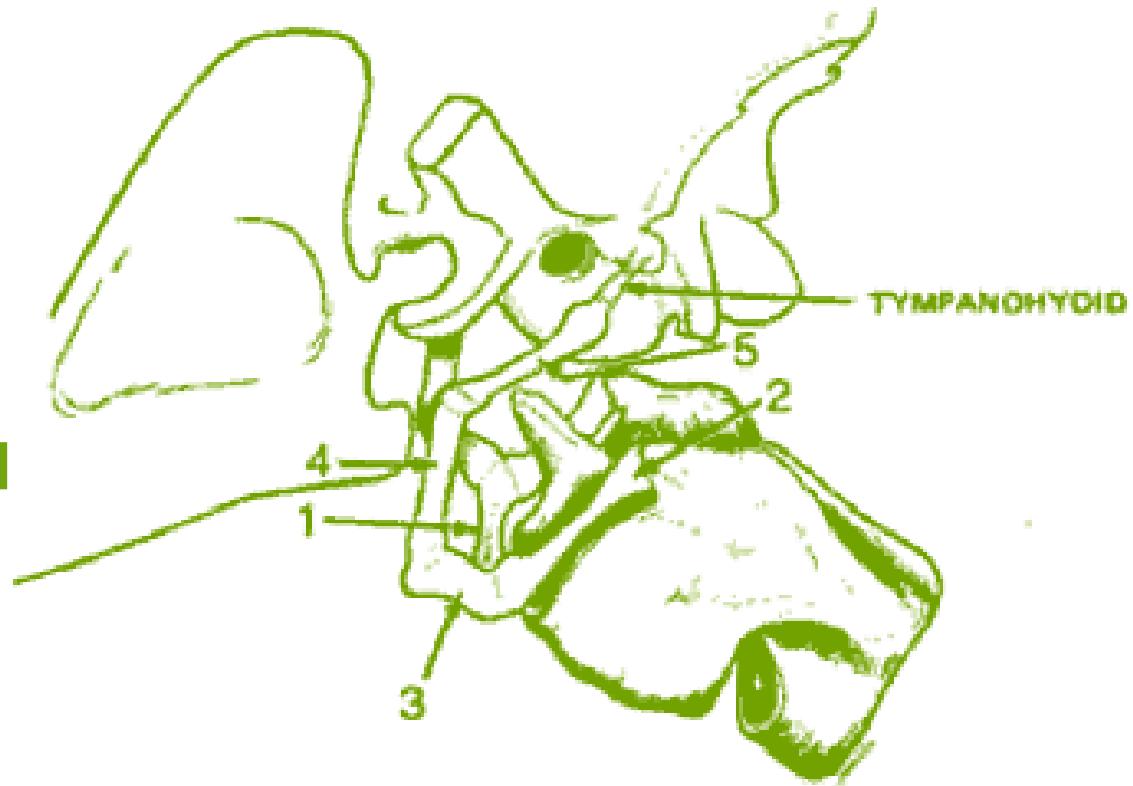
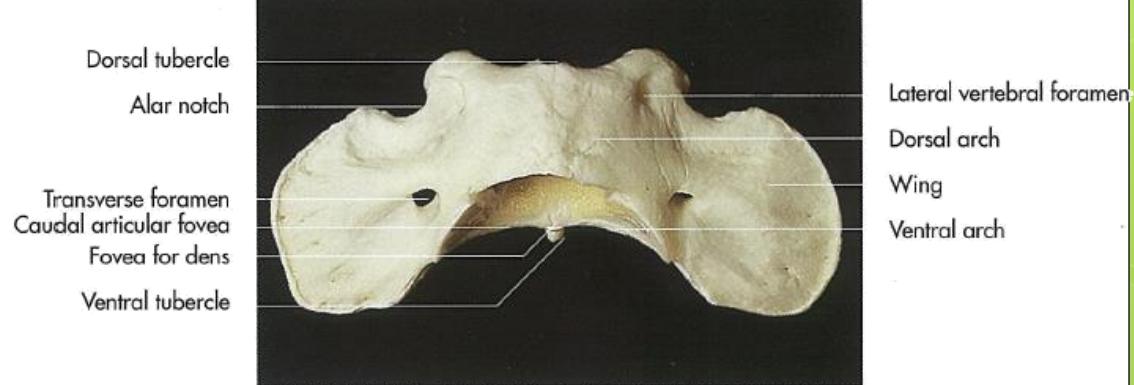


Fig.6.21. Hyoid apparatus, lateral view.

COLUMNA VERTEBRAE

A. Vertebrae Cervicalis

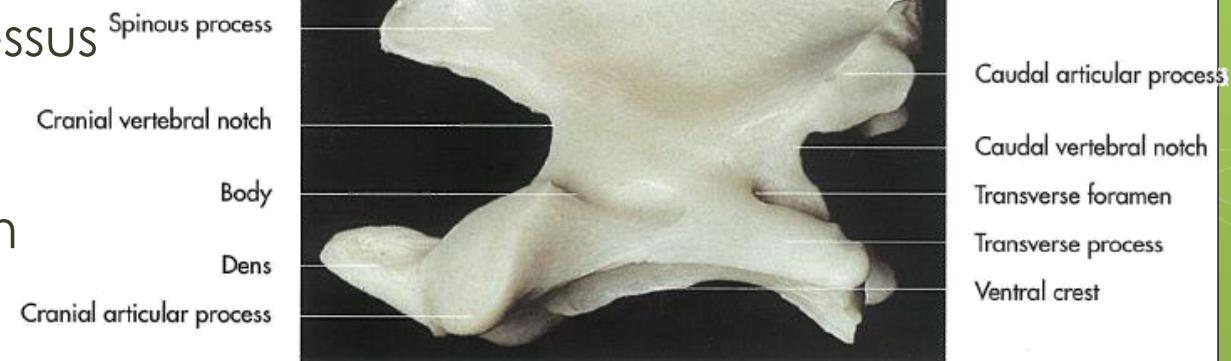
- Vertebrae Cervicalis I
 - Anjing: Foramen alare berubah bentuk menjadi **incisura alaris**



First cervical vertebra (atlas) of a dog (dorsal aspect).

- Vertebrae Cervicalis II

- Anjing: Processus spinosusnya menjulur kedepan dan kebelakang



Second cervical vertebra (axis) of a dog (lateral aspect).

- Vertebrae Cervicalis III, IV, V
 - Tiga ruas ini memiliki bentuk dan struktur hampir mirip, perbedaannya adalah **makin kebelakang ruas tulang makin dekat**
 - Ciri umum yang menonjol adalah **processus transversus yang terbagi dua**, yang kedepan menjulur ke ventral yang kebelakang menjulur ke dorsal.
- Vertebrae Cervicalis VI
 - Pada carnivora baik anjing, kucing dan lainnya, prosesus ini **membentuk lamina**.
- Vertebrae Cervicalis VII
 - Merupakan VC yang **prosesusnya paling tinggi** dan hanya **memiliki satu penjuluran**.

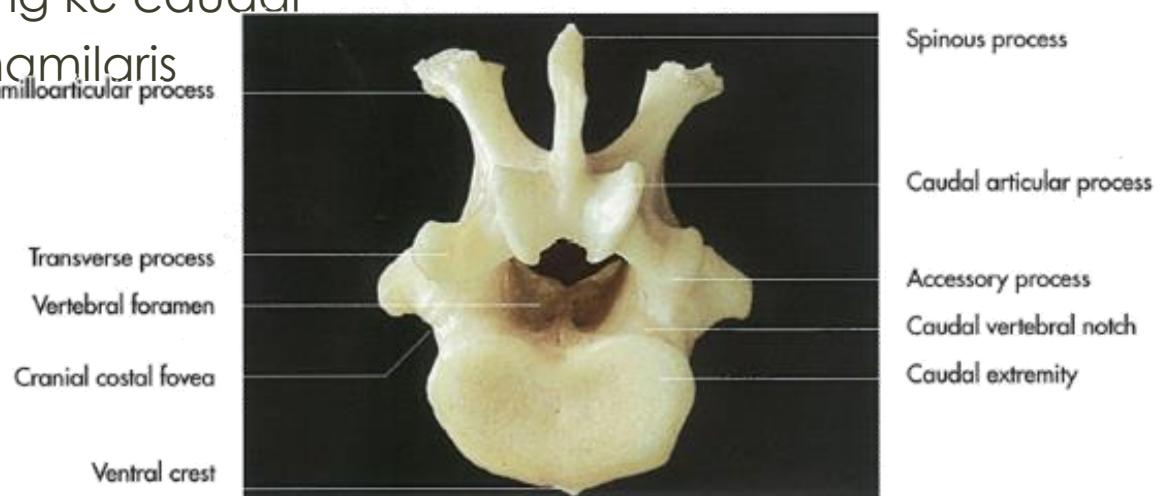
B. Vertebrae Thoracalis

○ Corpus

- fovea costale cranial
- fovea costale caudale

○ Arcus

- Arcus pada VT pada carnivore sama dengan hewan lainnya memiliki beberapa processus yaitu:
 - Processus transversus
 - Processus spinosus
 - Processus articularis: makin ke caudal makin pendek dan condong ke caudal
 - Processus mamillaris



13th thoracic vertebra of a dog (caudal aspect).

C. Vertebrae Lumbalis

- Arcus pada VL ada beberapa yaitu:
 - Processus transversus: pada anjing tumbuh runcing sehingga disebut **processus costiformis**. Paling panjang V.L 5 atau 6.
 - Processus spinosus
 - Processus articularis
 - Processus mamillaris
 - Processus accessorius

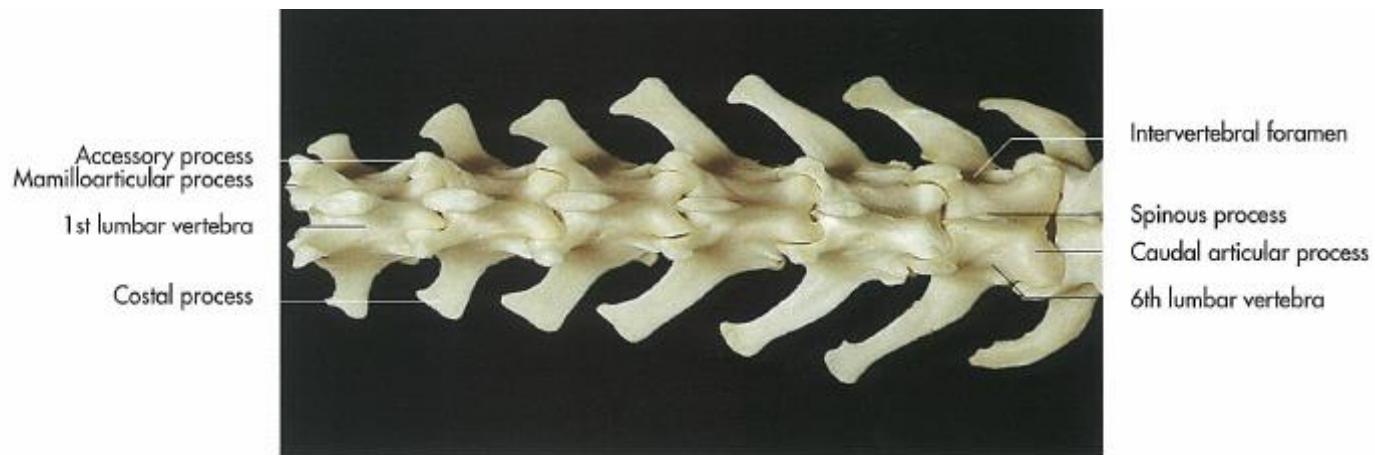


Fig. 1-93. Lumbar spine of a dog (dorsal aspect).

D. Vertebrae Sacralis

• **Processus transversus** pada anjing mengarah ke lateral, pada alae terbentuk bungkul tuberositas sacralis.

E. Vertebrae Coccygealis

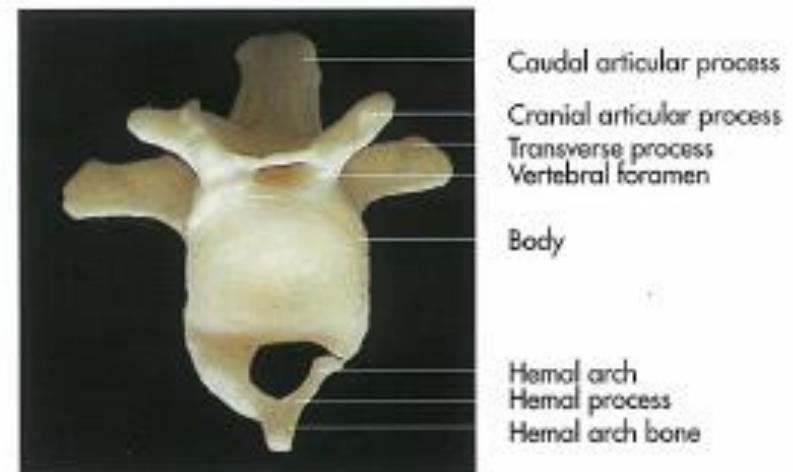
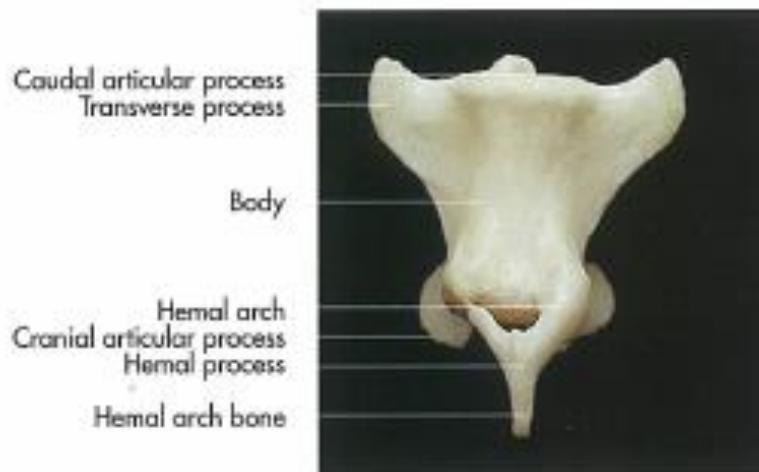


Fig. 1-102. Fourth caudal vertebra of a dog (ventral aspect).

Fig. 1-103. Fifth caudal vertebra of a dog (cranial aspect).

THORAX

A. Os Costae

- Pada carnivore baik anjing, kucing maupun lainnya kasnya juga memiliki **costae fluctuantes** seperti pada manusia yang mana tidak dimiliki oleh spesies lainnya.

Spesies		Costae		Sternum	VT
	Sternale	Asternale	Fluctuantes		
Anjing	9	4 (3)	0 (1)	8/9	13
Kucing	9	4 (3)	0 (1)	8/9	13

- Costae anjing lebih melengkung dibanding pada mamalia domestik

Neck of rib
Head of rib
Angle of rib

Shaft of rib



Fig. 1-105. Rib of a dog (caudal aspect).

Costal tubercle
Head of rib
Costal groove

Shaft of rib



Fig. 1-106. Rib of a pig (caudal aspect)

Cartilage of the manubrium
Manubrium of the sternum
Cartilage of the 1st rib

Body of sternum

Rib cartilage

Sternal synchondrosis

Xiphoid process

Xiphoid cartilage

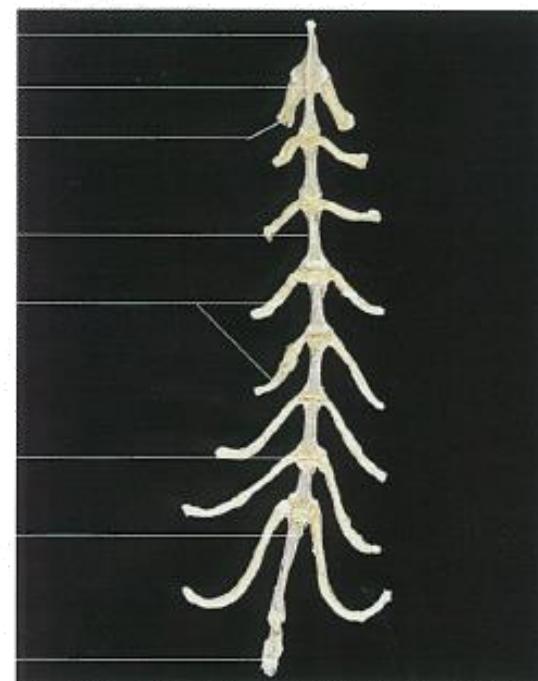


Fig. 1-109. Sternum of a cat (dorsal aspect).

B. Os Sternum

- **Cospus sterni → silinder pada carnivor**

MEMBRI THORACICI

A. Os Scapula

- Acromion kucing membentuk struktur yang membulat **disebut processus suprhamatus** (merupakan perpanjangan bagian distal acromion yang membentuk persendian dengan humerus).
- os clavicula berdasarkan salah satu pengamatan radiograf, terdapat muskulus di bagian brachiocephalicus, tidak membentuk persendian dengan tulang.

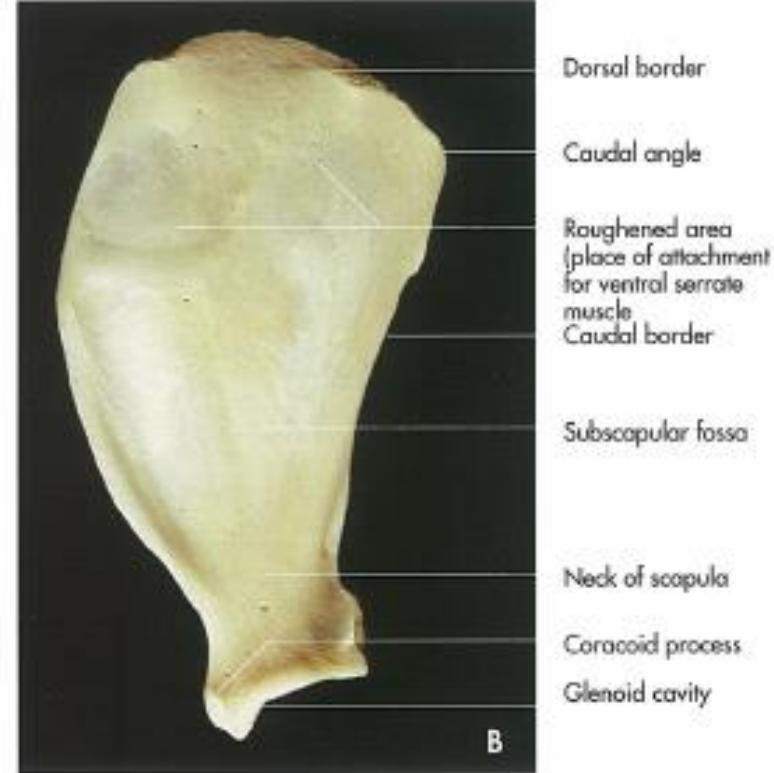
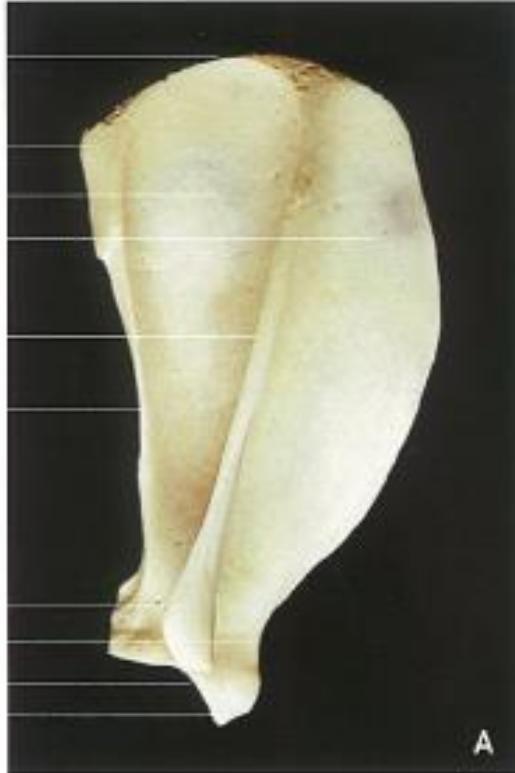


Kucing

Processus
suprhamatus

Os Scapula Anjing

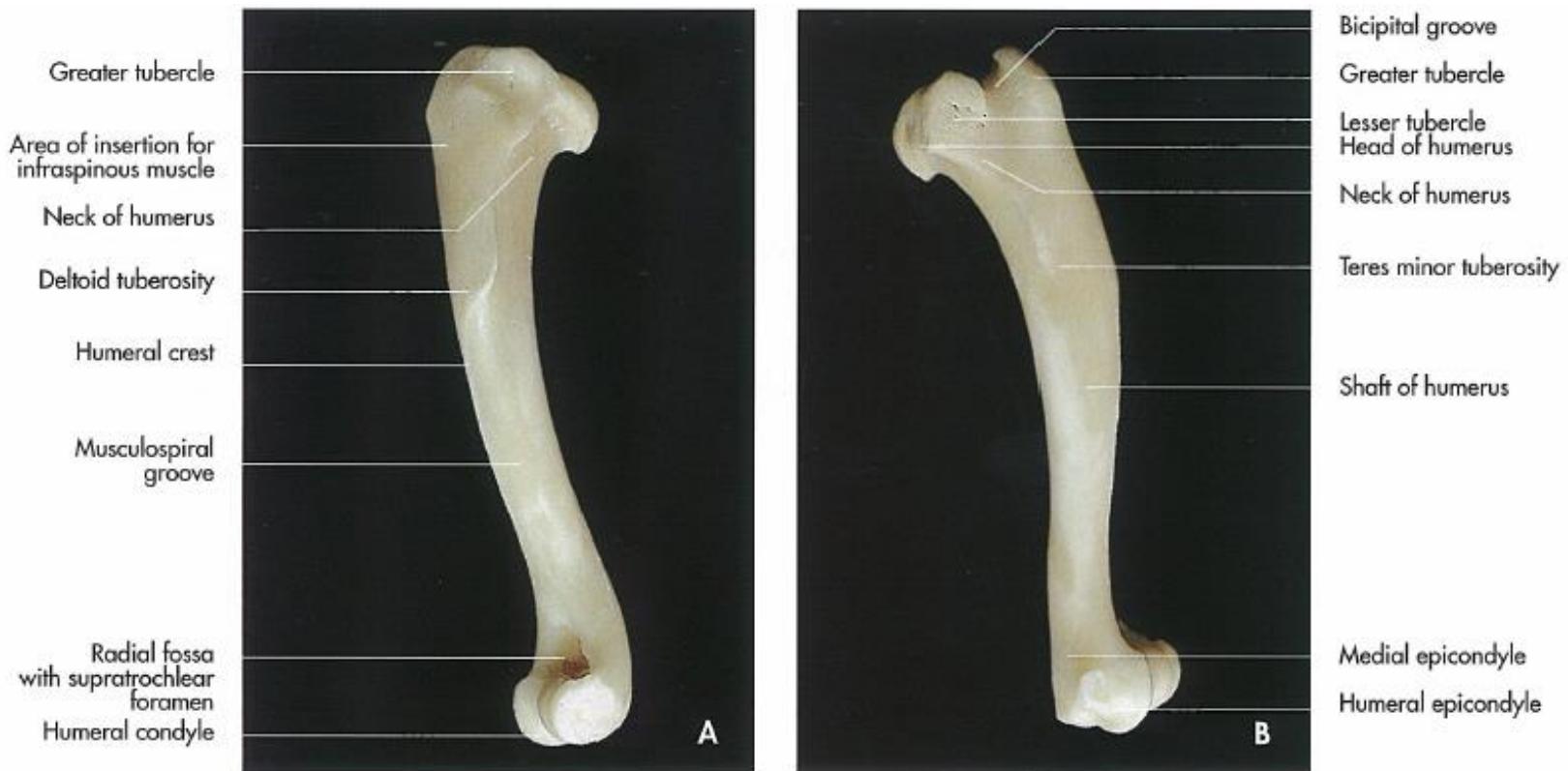
Dorsal border
Caudal angle
Infraspinous fossa
Supraspinous fossa
Scapular spine
Caudal border
Hamate process
Scapular notch
Glenoid cavity
Supraglenoid tubercle



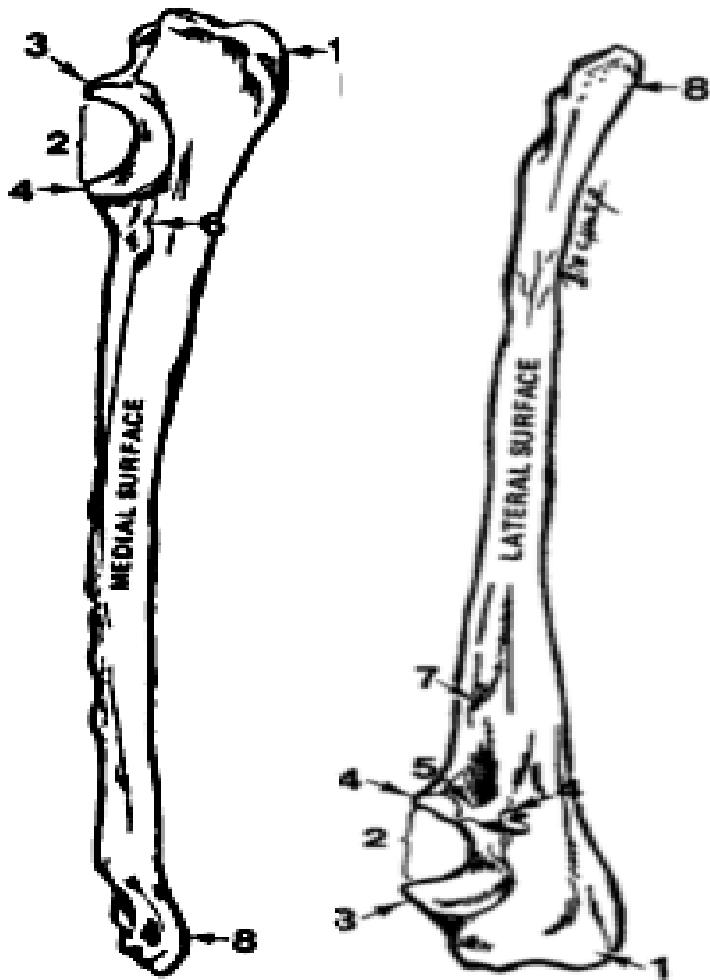
B. Humerus

- Antara caput dan corpus dipisahkan oleh collum
- Pada **anjing terdapat pembagian tuberositas mayor menjadi cranial dan caudal, pada kucing tidak.**
- Pada carnivora tidak memiliki tuberositas teres mayor, namun digantikan oleh crista tuberculi minor.
- Anjing memiliki **foramen supratroclearis**.
- Kucing memiliki **foramen supracondylaris** yang berada di distal bagian medial os humerus yang dilewati oleh **n./v.brachialis**

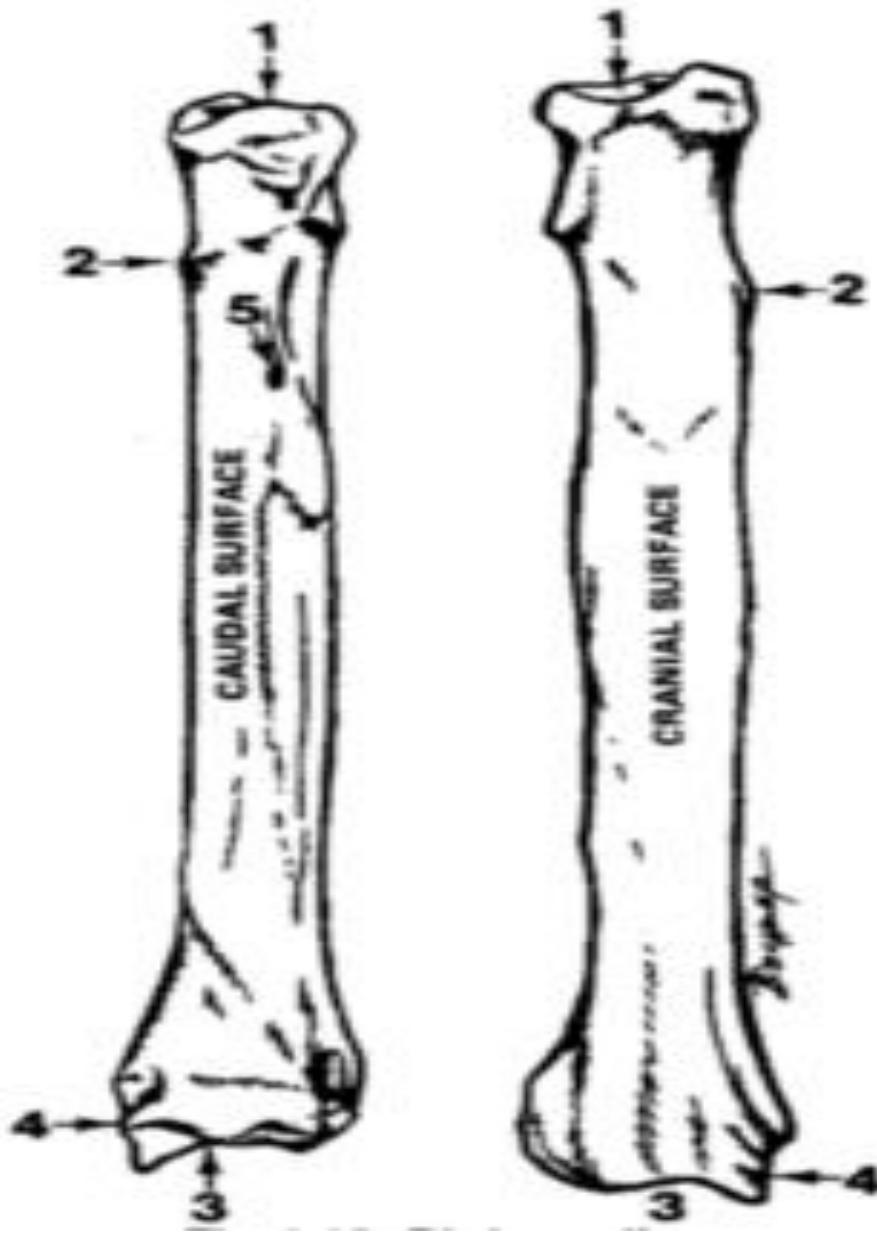
Os Humerus Anjing



C. Os Radius Ulna



- **Os Ulna**
- **Keterangan:**
 1. Olecaranon
 2. Incisura semilunar/ trochlearis
 3. Proc. Onconeus
 4. Proc. Coronoideus
 5. Incissura radii
 6. Tuberositas ulnaris
 7. Foramen nutritia
 8. Proc. Styloideus lateral

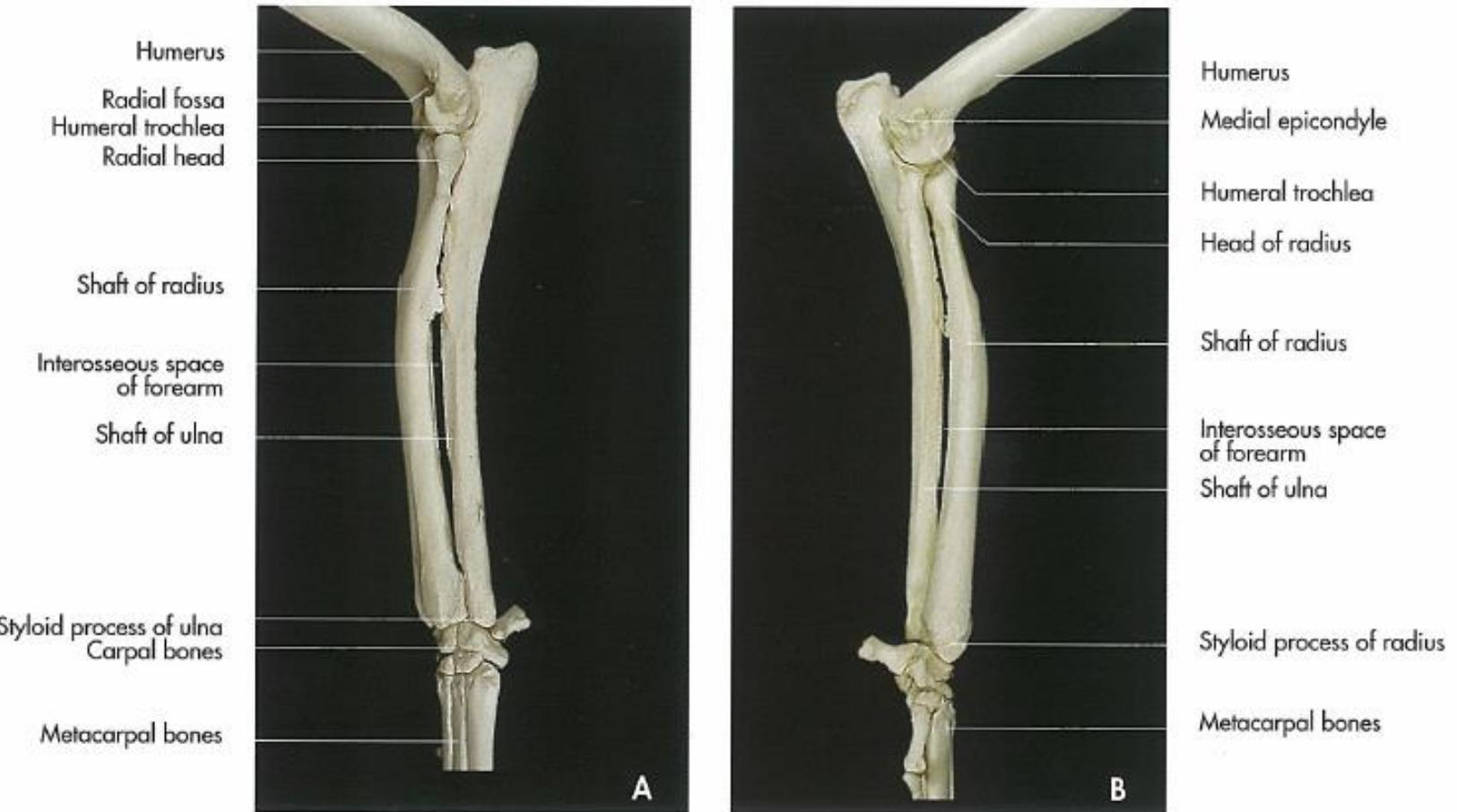


Os Radius

Keterangan:

1. Foveacavitis
2. Tuberositas radii
3. Trochlea radii
4. Proc. Styloideus medial
5. Foramen nutritia

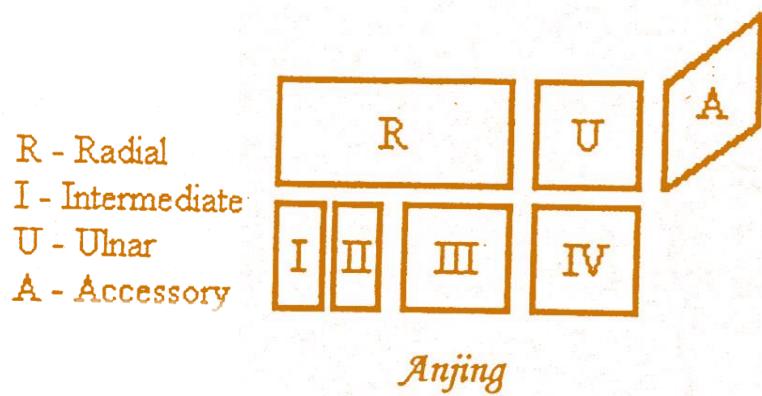
Os Radius Ulna Anjing



D. Carpal, Metacarpal, Digit

- Os Carpal

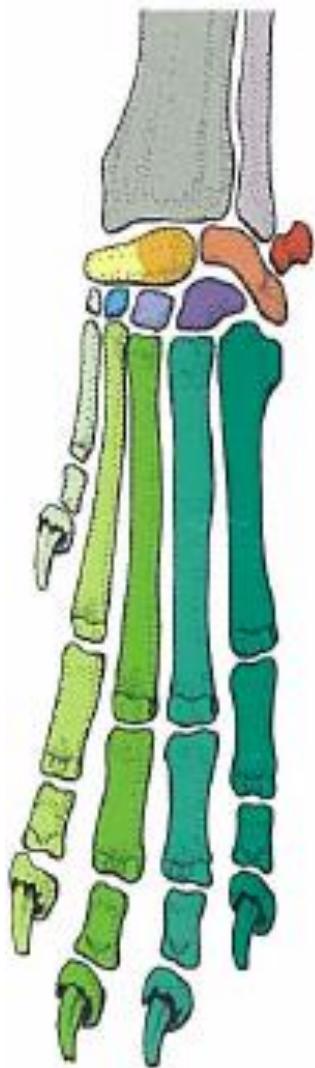
- Pada carnivor radial dan intermediet berfusi → jumlah os carpal 7



1. Os carpal Intermedioradial
2. Os carpal ulnaris
3. Os carpal accessorius
Carpal No, I, II, III, IV

- Os Metacarpal (Mc)

- Pada carnivor dimana tumpuan berada pada digit, kelima os metacarpal berkembang.
- Mc. III dan IV paling panjang, II dan V lebih pendek, dan I yang paling pendek.



Dog

Intermedioradial carpal bone
1st carpal bone
2nd carpal bone

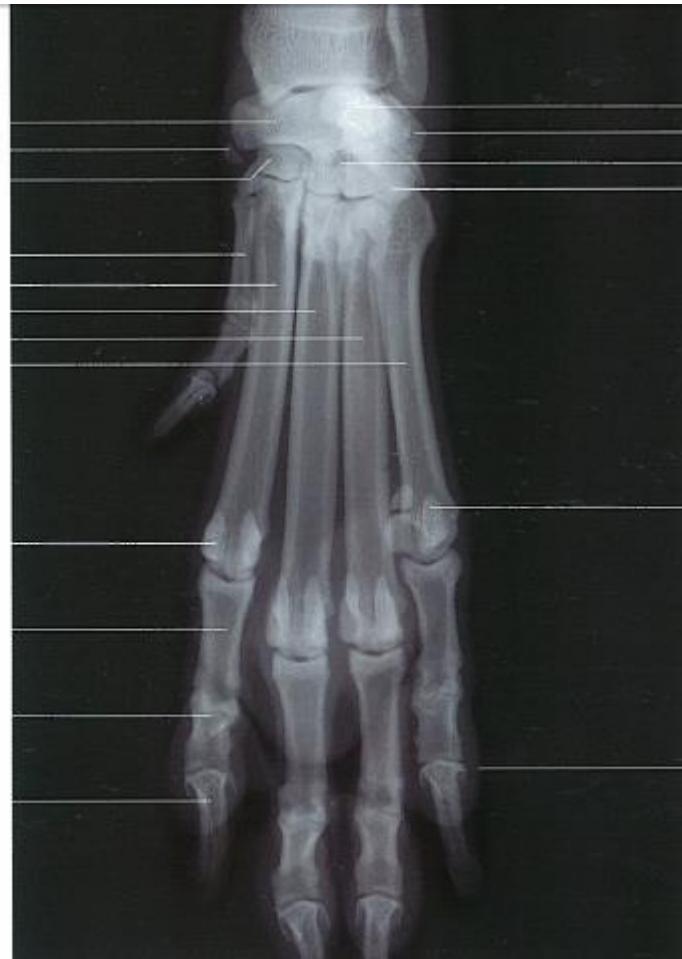
1st metacarpal bone
2nd metacarpal bone
3rd metacarpal bone
4th metacarpal bone
5th metacarpal bone

Sesamoid bones

Proximal phalanx

Middle phalanx

Distal phalanx



Ulnar carpal bone
Accessory carpal bone
3rd carpal bone
4th carpal bone

Sesamoid bones

Soft tissue density

- Os Digitorum manus

- Pada tiap metacarpophalangea terdapat sepasang os sessamoidea, kecuali pada phalanx pertama
- Phalanx distal berbentuk seperti kait
 - Facies parietalis dibagi menjadi facies palmaris dan fascies solaris
 - Crista unguicularis → dorsal
 - Sulcus unguicularis → distal

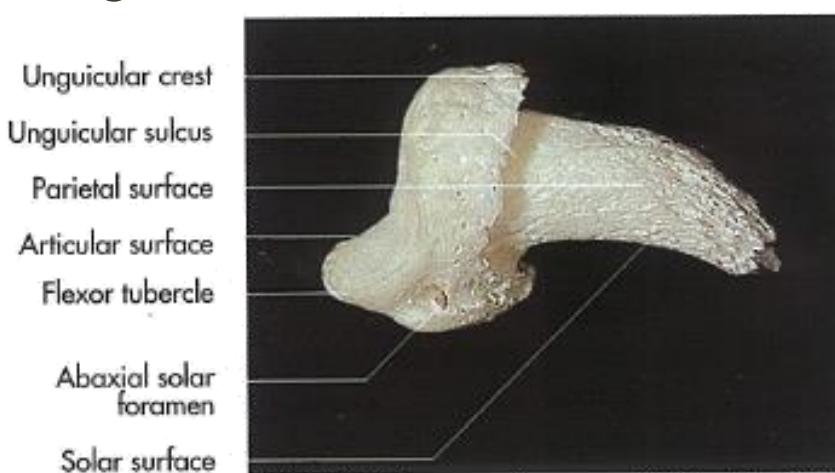
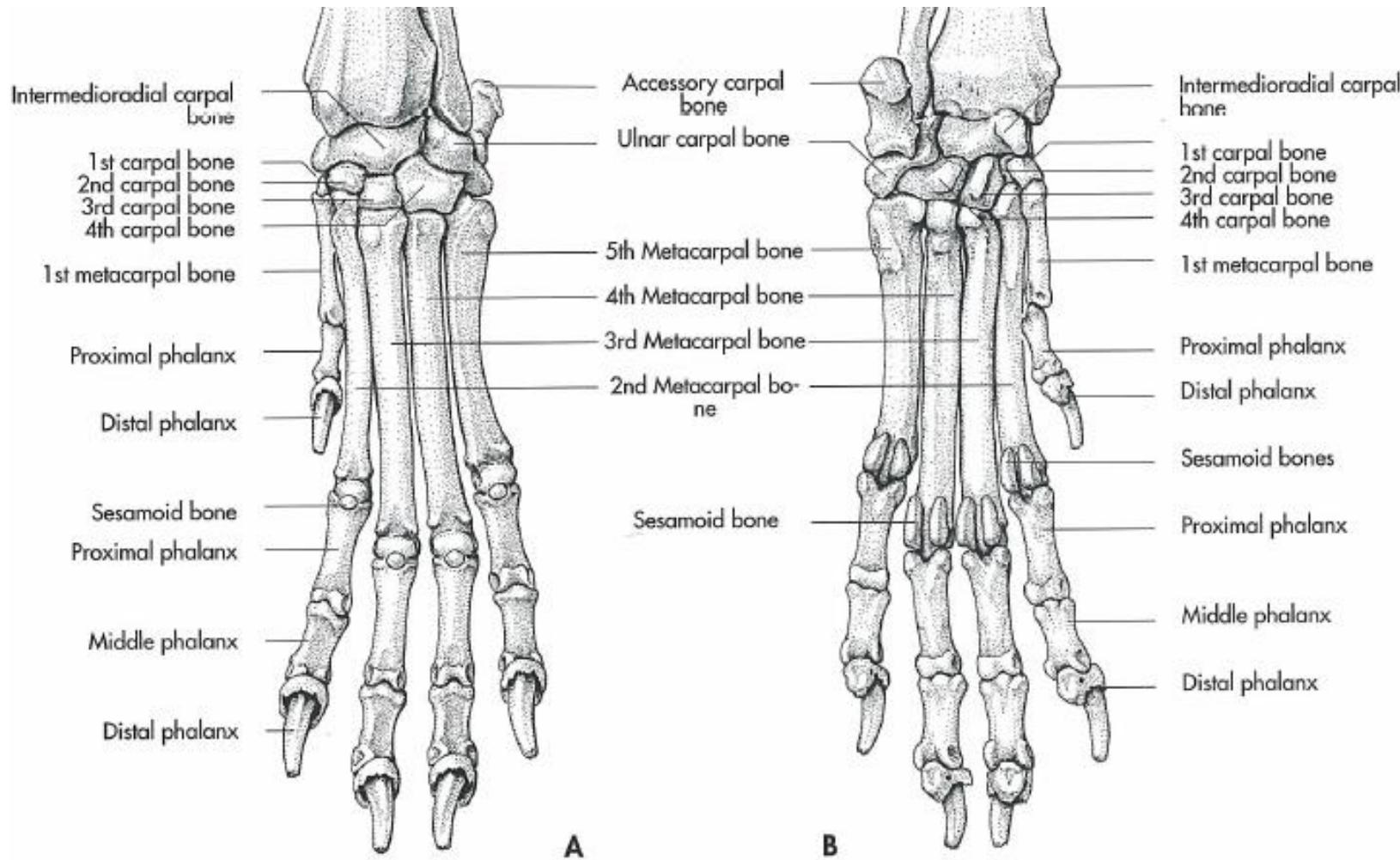


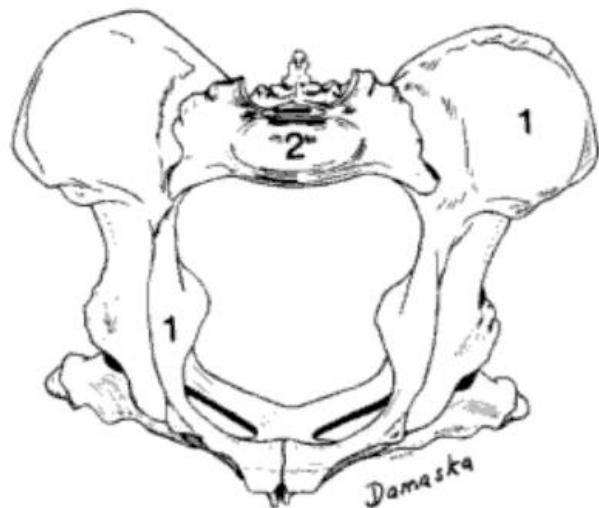
Fig. 3-17. Distal phalanx of a dog (lateral aspect).



MEMBRI PELVINI

A. Coxae

- Os ileum
- Os ischium
- Os pubis



Os pelvis tampak lateral

Keterangan:

1. Os ileum
2. Os sacrum

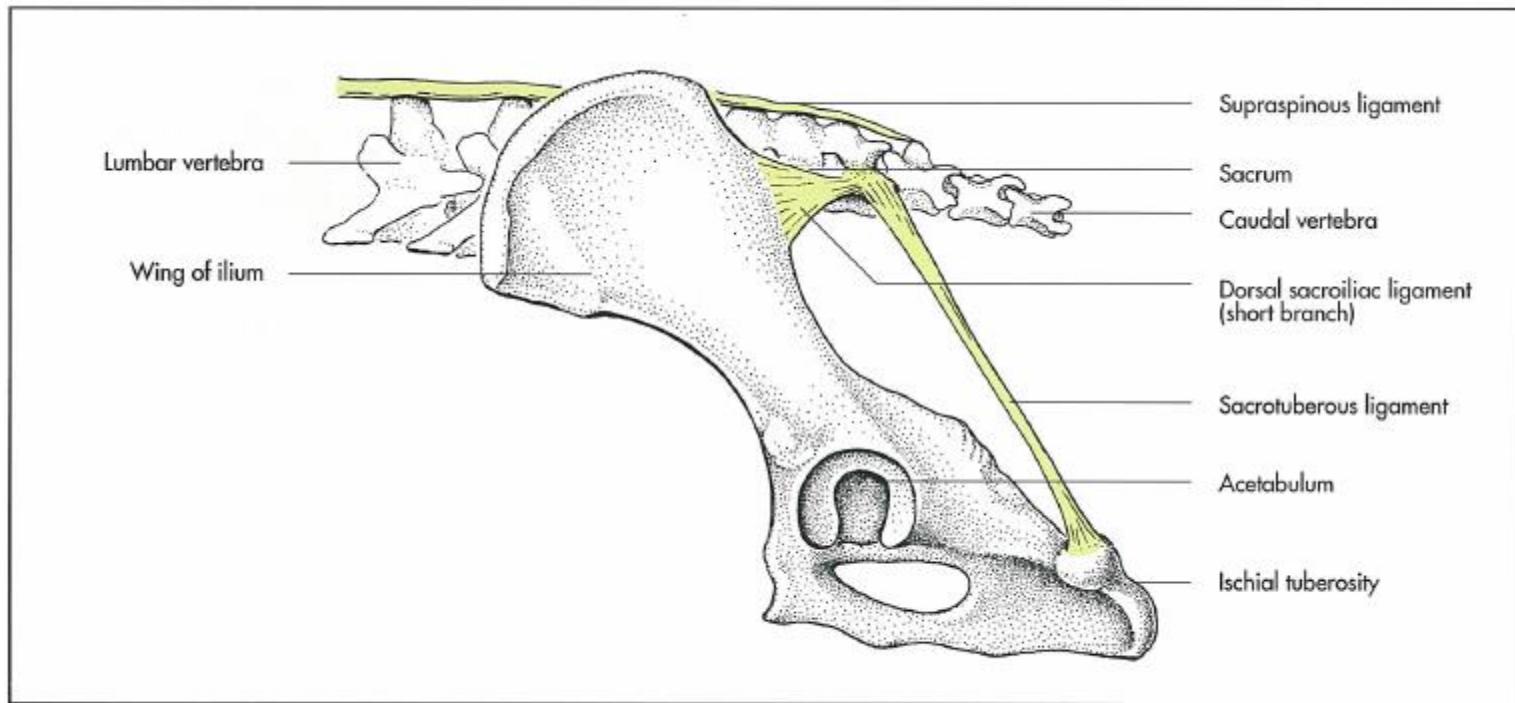


Fig. 4-46. Sacrotuberous ligament of the dog (schematic).

- Kucing: tidak memiliki ligamentum sacrotuberous

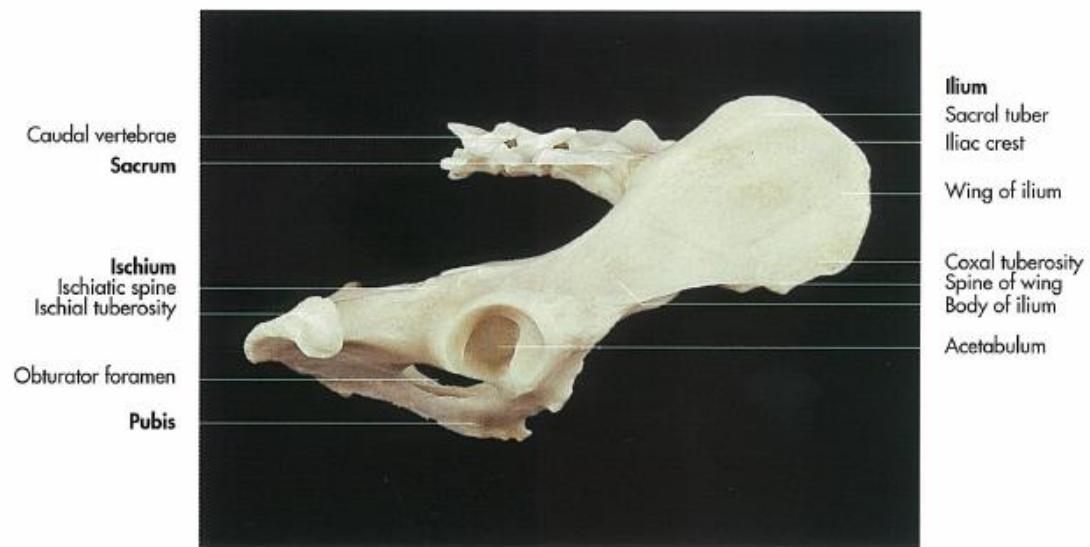


Fig. 4-9. Hip bones (*ossa coxae*), sacrum and caudal vertebrae of a dog (left lateral aspect).

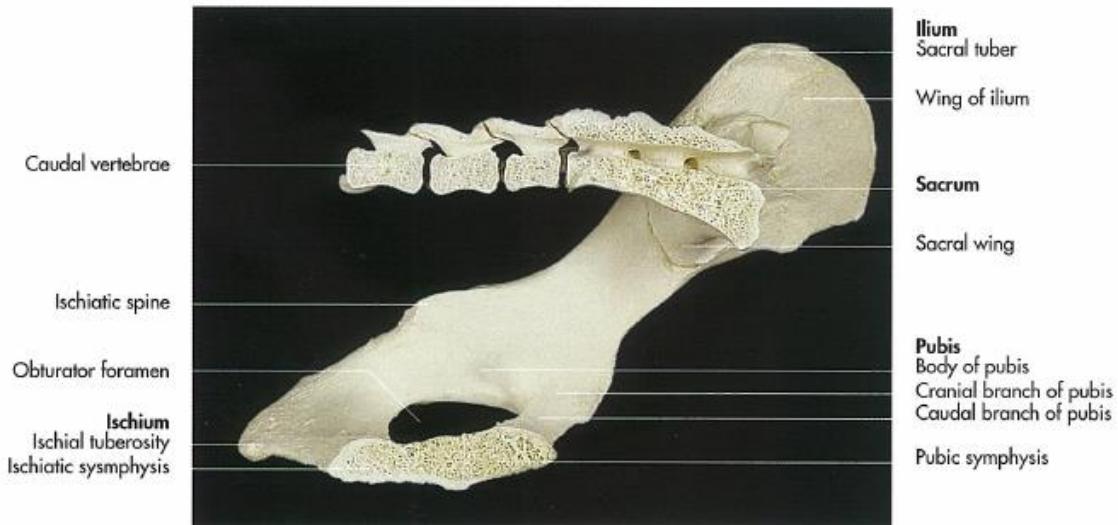


Fig. 4-10. Os coxae, sacrum and caudal vertebrae of a dog, paramedian section of the left hip bone (medial aspect).

- Os Femur

- Tidak memiliki **fossa supracondyloidea** atau **fossa plantaris**

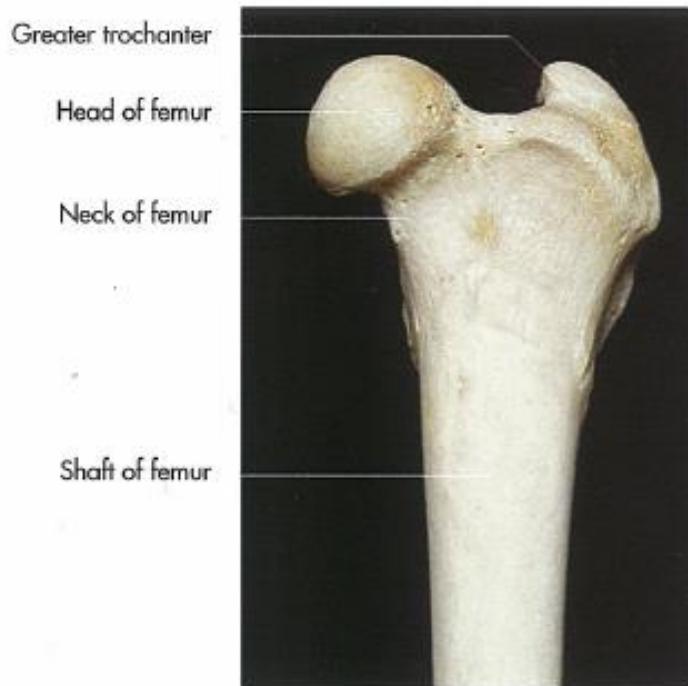


Fig. 4-18. Proximal extremity of the left femur of a dog (cranial aspect).

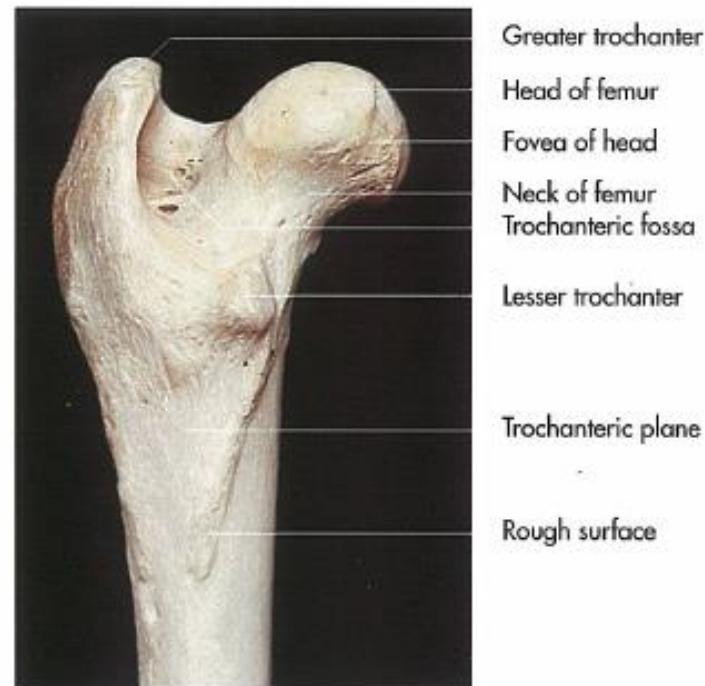


Fig. 4-19. Proximal extremity of the left femur of a dog (caudal aspect).

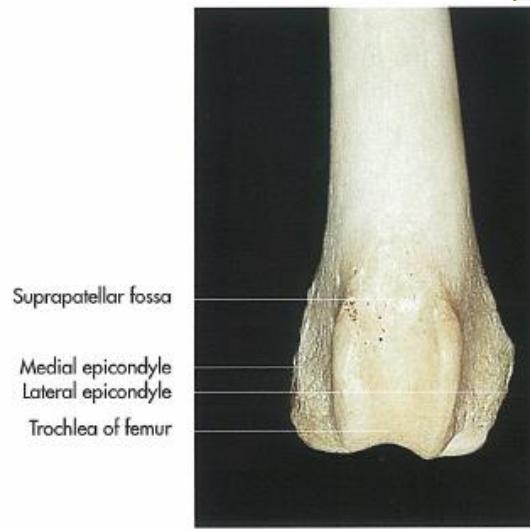


Fig. 4-20. Distal extremity of the left femur of a dog (cranial aspect).



Fig. 4-21. Distal extremity of the left femur of a dog (caudal aspect).

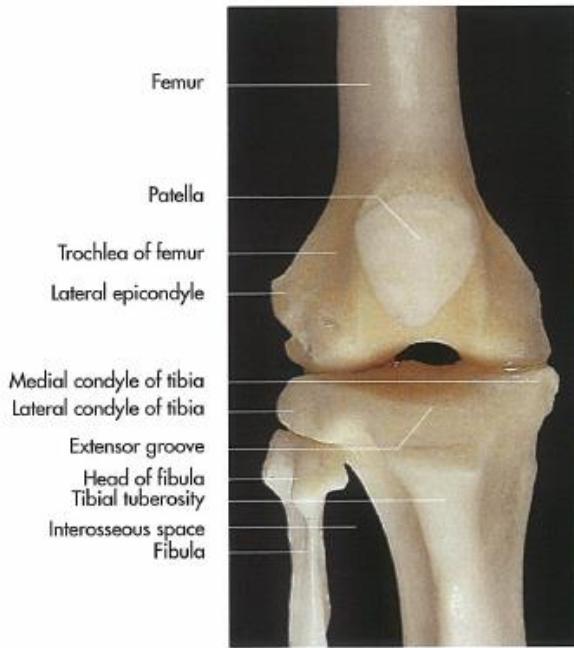


Fig. 4-24. Skeleton of the right stifle joint of a dog (cranial aspect).

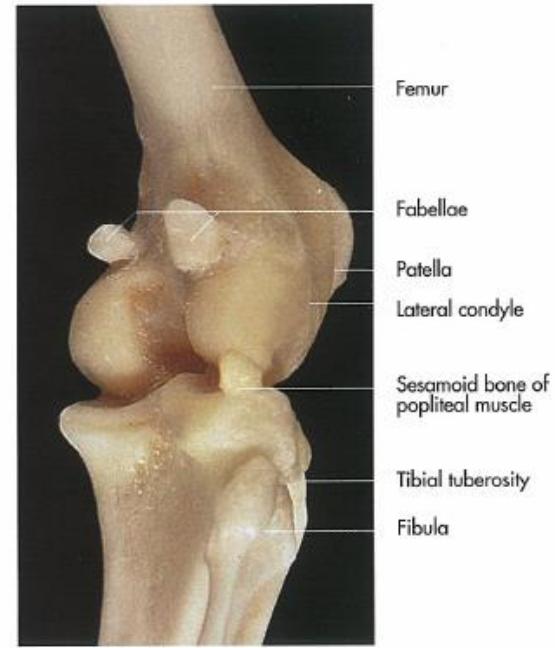


Fig. 4-25. Skeleton of the right stifle joint of a dog (caudolateral aspect).

- Os Tibia Fibula

- os. Fibula lengkap dan memanjang hingga ke ujung distal

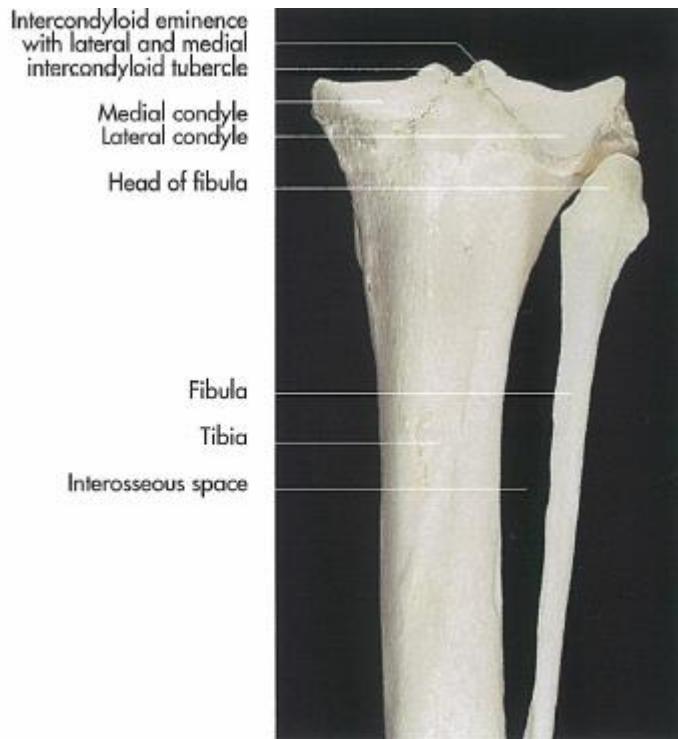


Fig. 4-30. Proximal extremity of the right tibia and fibula of a dog (caudal aspect).

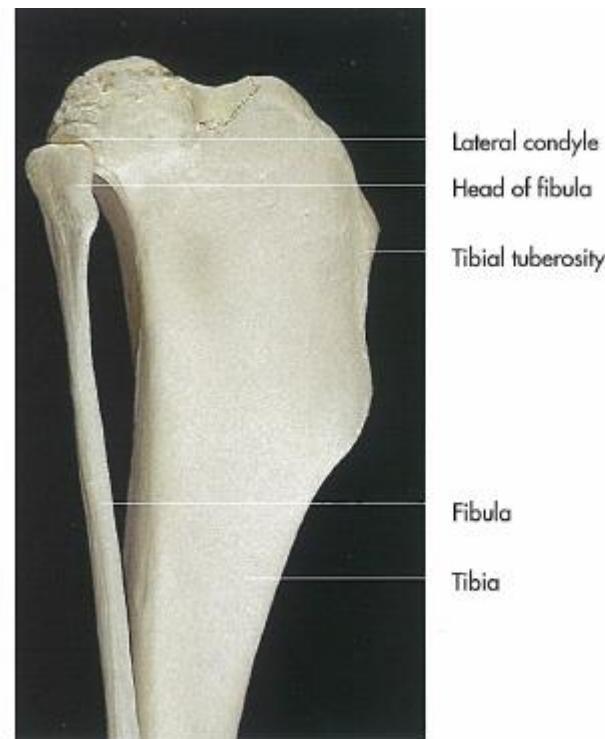


Fig. 4-31. Proximal extremity of the right tibia and fibula of a dog (craniolateral aspect).



Fig. 4-32. Distal extremity of the right tibia and fibula of a dog (caudal aspect).

Fig. 4-33. Distal extremity of the right tibia and fibula of a dog (cranial aspect).

○ Os Tarsal

Hewan	Σ	talus	calcaneus	centrale	IV	III	II	I
Anjing	7	+	+	+	+	+	+	+

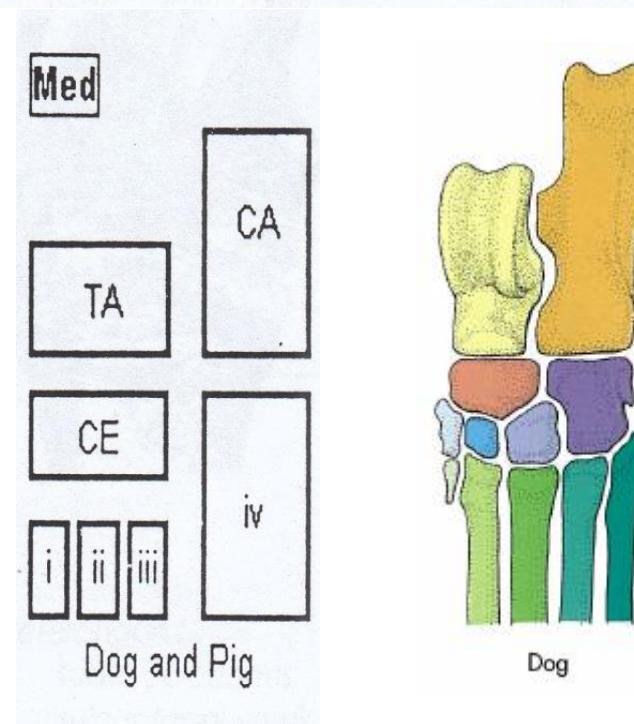
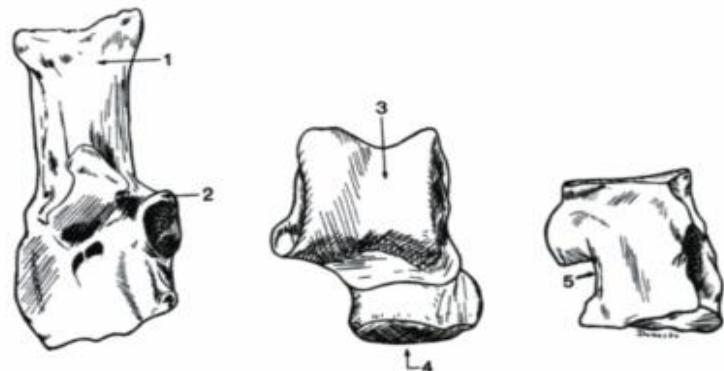




Fig. 5.20. Bones of the right tarsus, dorsal view.



Kiri (calcaneus), tengah(thalus), dankanan(tarsal 4)

Keterangan:

1. Calcaneus
2. Talus
3. Os tarsal central
- Os tarsal I,II,III,IV

Keterangan:

1. Tuber calcaneus
2. Sustentaculum tali
3. Troclea
4. Caput talus
5. Sulcus tarsal lateral

Os Tarsi & Os Metatarsi

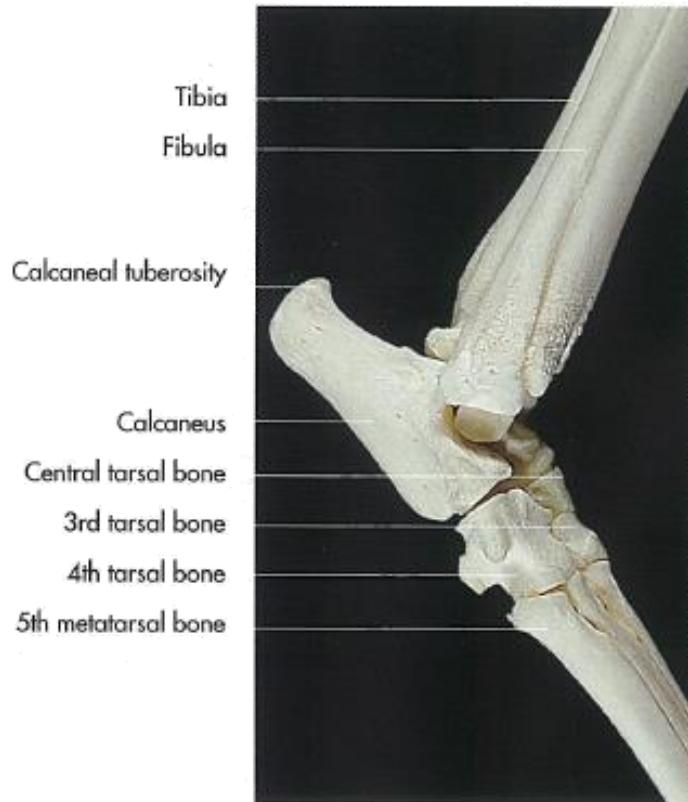


Fig. 4-42. Skeleton of the right tarsus of a dog (lateral aspect).

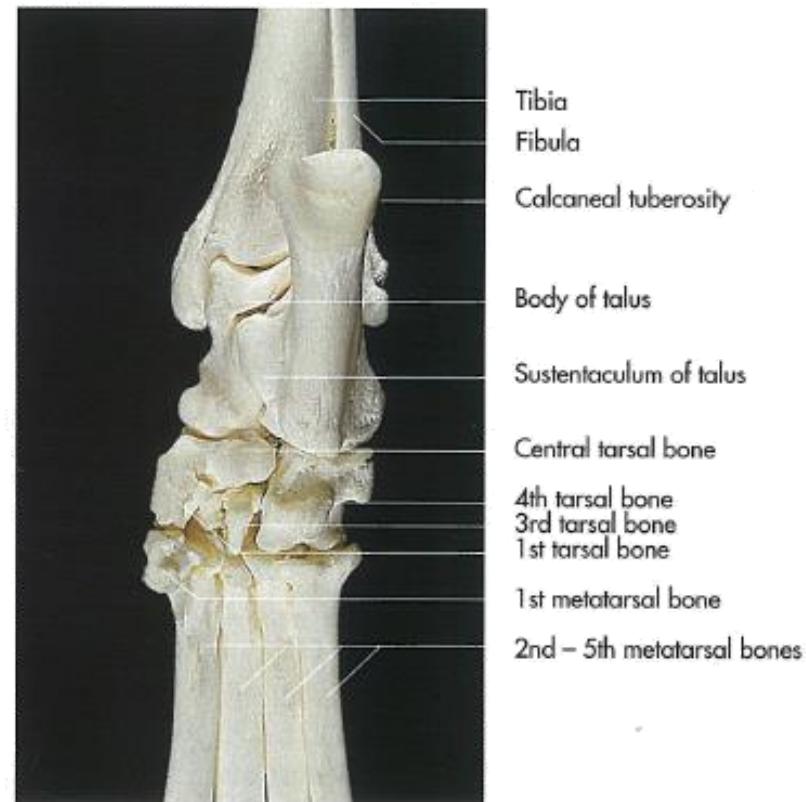
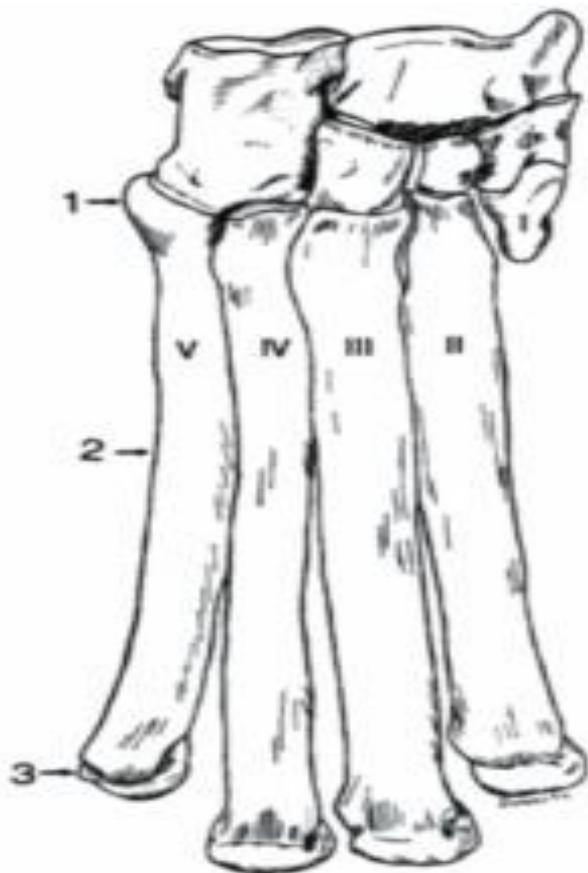


Fig. 4-43. Skeleton of the right tarsus of a dog (plantar aspect).

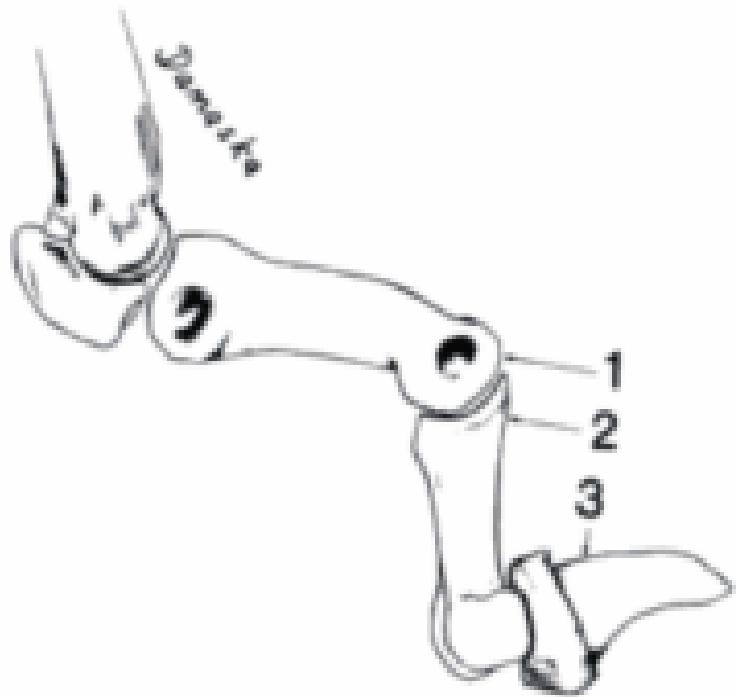
Os Metatarsal dexter



Keterangan:

1. Condyles metatarsal
 2. Corpus metatarsal
 3. Caput metatarsal
- Metatarsal I,II,III,IV

Os Digitii II



Keterangan:

1. Digitii II-IV proximal
2. Digitii II-IV medial
3. Digitii II-IV distal