

ATMUNGSAPPARAT (APPARATUS RESPIRATORIUS)

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Universität für Veterinär Medizine

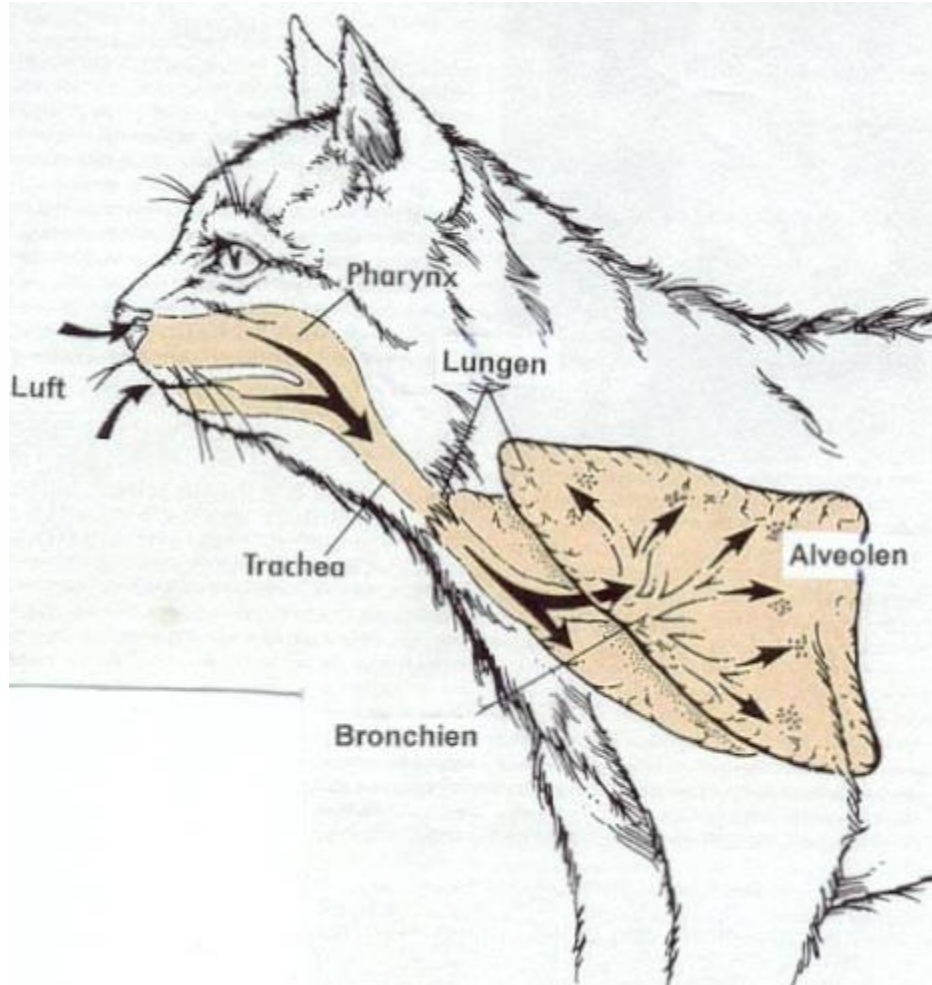
Lehrstuhl für Anatomie und Histologie

23. April 2019

ATMUNGSAPPARAT

Funktion der Atmungsorgane

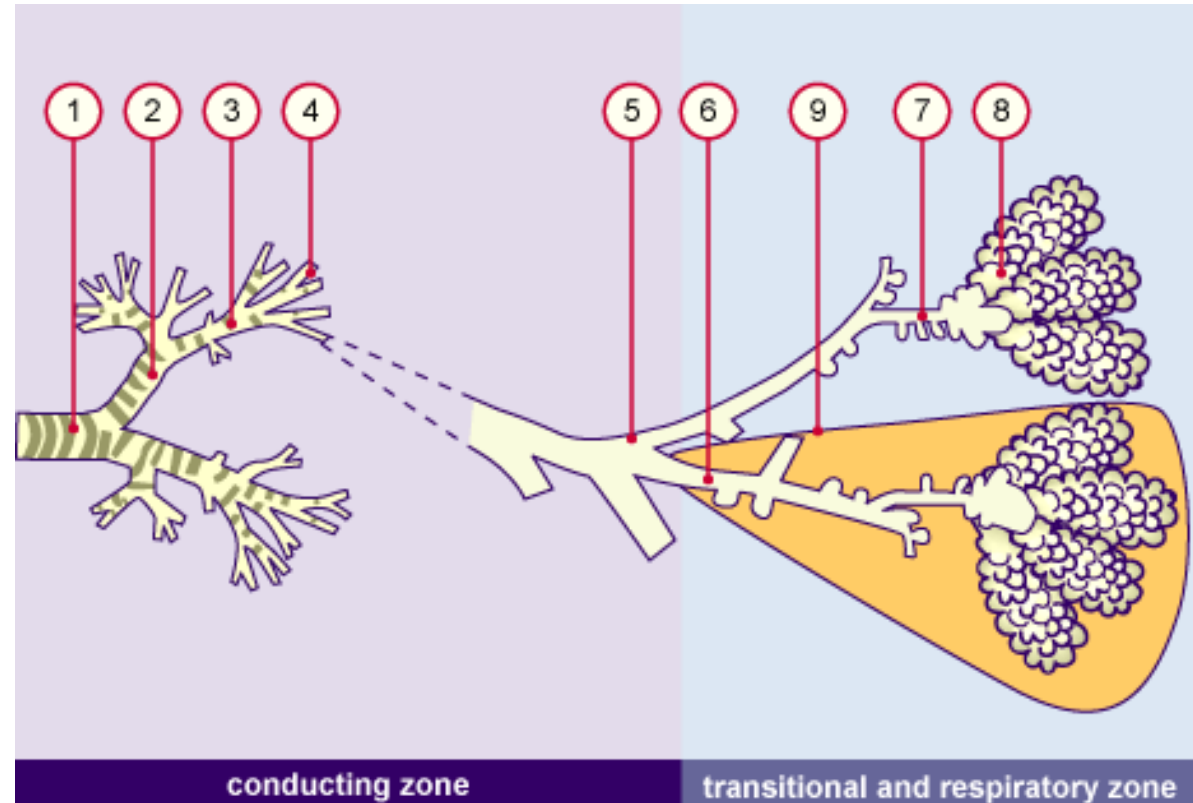
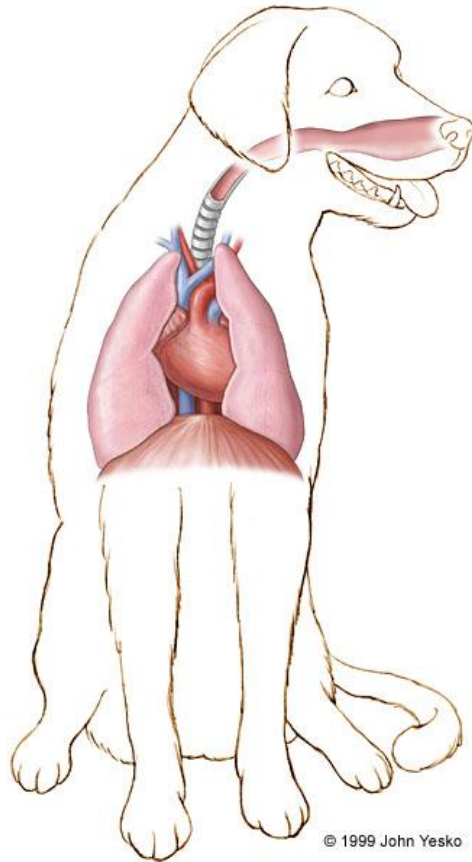
- ermöglichen den Gasaustausch
- Geruchsorgan
- Lautbildung



ATMUNGSPARAT

setzt sich aus:

1. LUFTLEITENDEN ORGANABSCHNITTEN
2. LUFTAUSTAUSCHENDEN ORGANABSCHNITTEN



- | | |
|-------------------------------------|------------------------------|
| 1. Trachea | 6. Bronchiolus respiratorius |
| 2. Hauptbronchus | 7. Ductus alveolaris |
| 3. Regio respiratoria Lobarbronchus | 8. Sacculus alveolaris |
| 4. Segmentalbronchus | 9. Azinus |
| 5. Bronchiolus terminalis | |

<http://www.med.umich.edu>

ATMUNGSAPPARAT

LUFTLEITENDEN ORGANABSCHNITTEN:

- führt in die Lunge

1. Nase (Nasus externus)

2. Nasenhöhle (Cavum nasi)

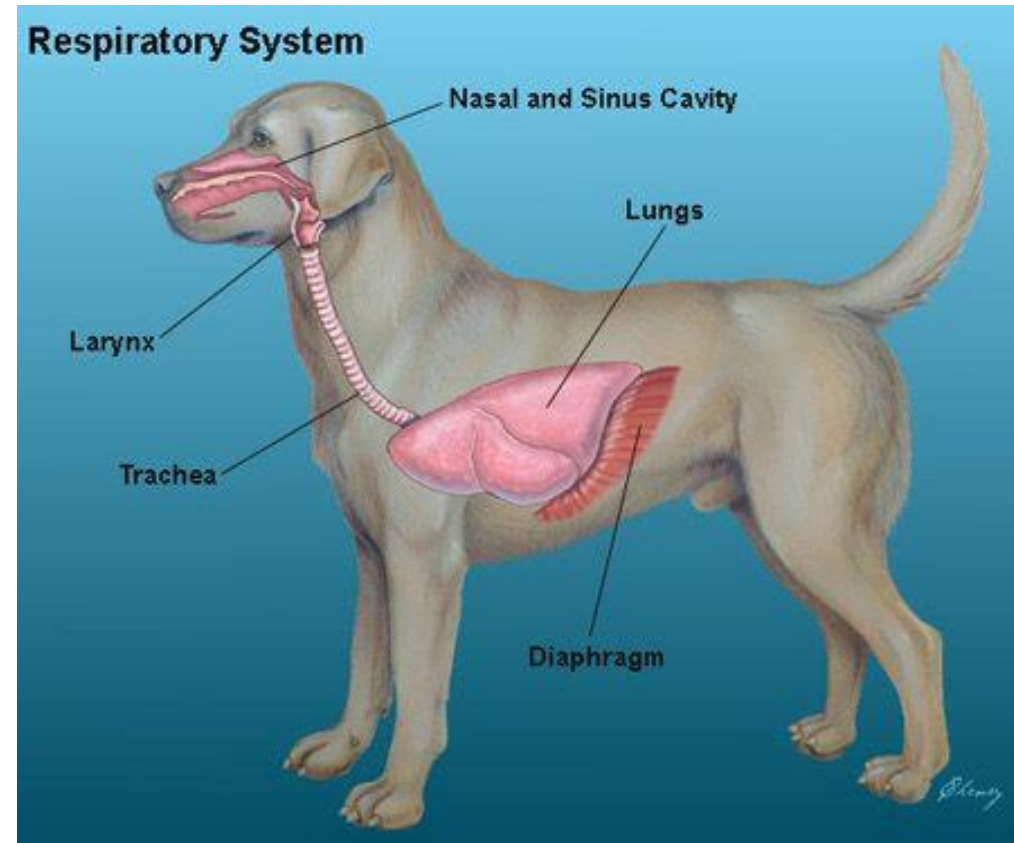
3. Nasennebenhöhlen (Sinus paranasales)

4. Kehlkopf (Larynx)

5. Luftröhre (Trachea)

6. Lungen (Pulmo sinister et dexter)

7. Bronchien (Bronchi)

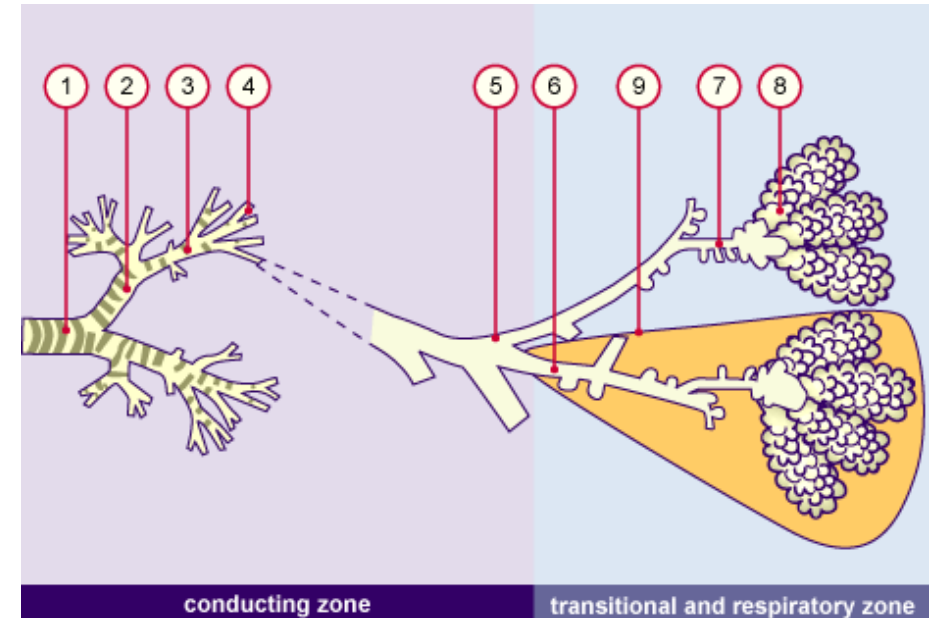
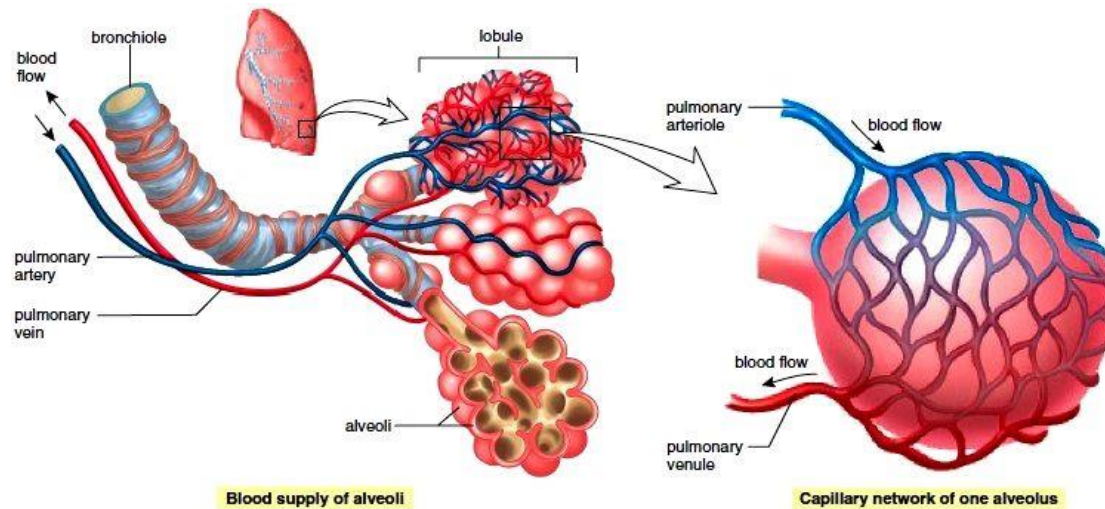


ATMUNGSAPPARAT

LUFTAUSTAUSCHENDEN (RESPIRATORISCHEN) ORGANABSCHNITTEN:

1. Bronchioli respiratorii
2. Ductus alveolares
3. Saccus alveolares
4. Alveolen (Alveoli pulmonis) – sind die terminalen Abschnitte des Atmungsapparates

- in ihnen findet der Gasaustausch (Blut – Luft Schranke) statt



- | | |
|-------------------------------------|------------------------------|
| 1. Trachea | 6. Bronchiolus respiratorius |
| 2. Hauptbronchus | 7. Ductus alveolaris |
| 3. Regio respiratoria Lobarbronchus | 8. Sacculus alveolaris |
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| 5. Bronchiolus terminalis | |

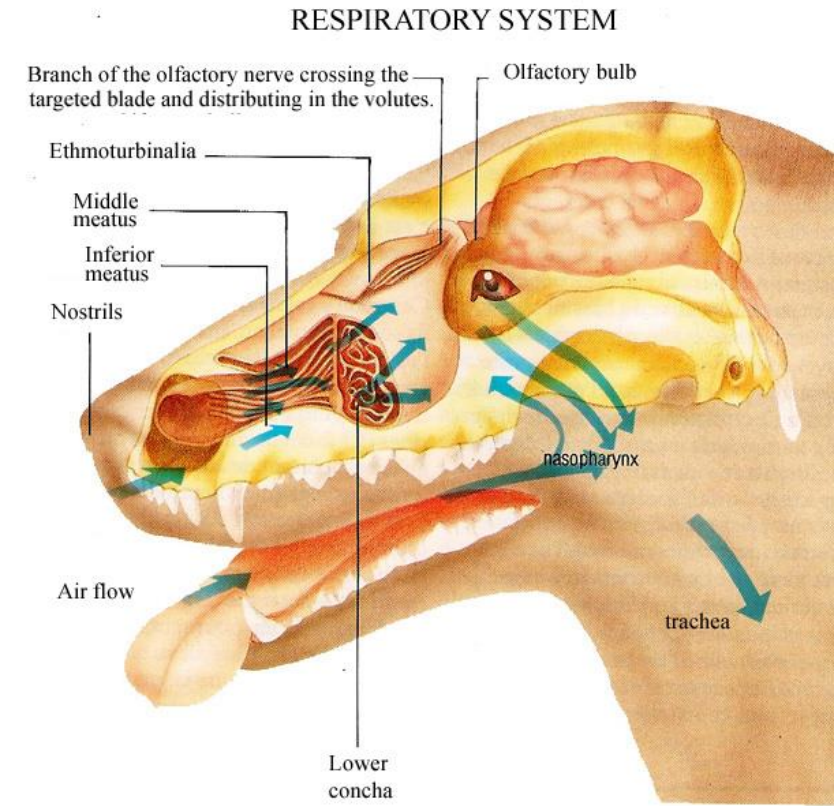
<http://www.med.umich.edu>

ATMUNGSAPPARAT

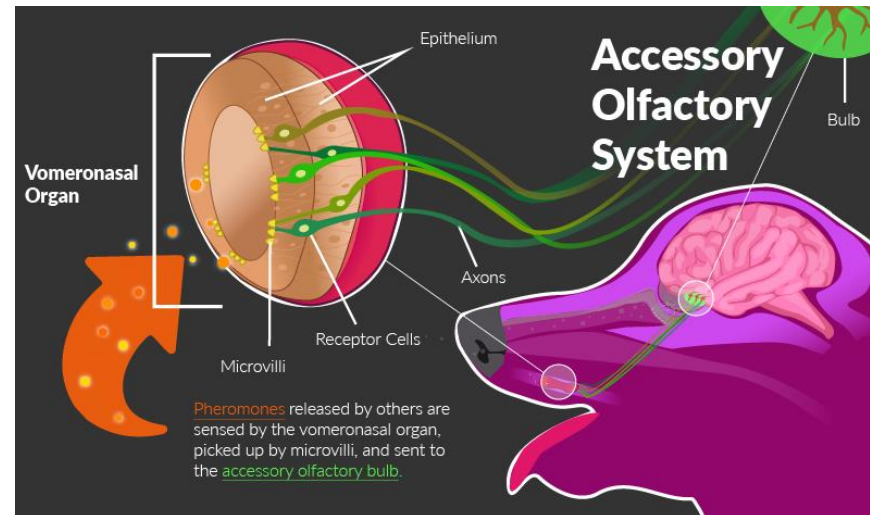
- die Organe des Atmungsapparates – von respiratorischer Schleimhaut ausgekleidet

AUSNAHME:

1. vordere Bereiche des Naseneingangs
 2. der Schlundkopf
 3. der Kehledeckel
 4. kleine Abschnitte der Innenauskleidung des Kehlkopfes
- } mehrschichtiges Plattenepithel
5. Nasengrund – olfaktorische Schleimhaut - Geruchswahrnehmung



<http://actinfochiens.free.fr/RESPIRATORY%20SYSTEM.html>

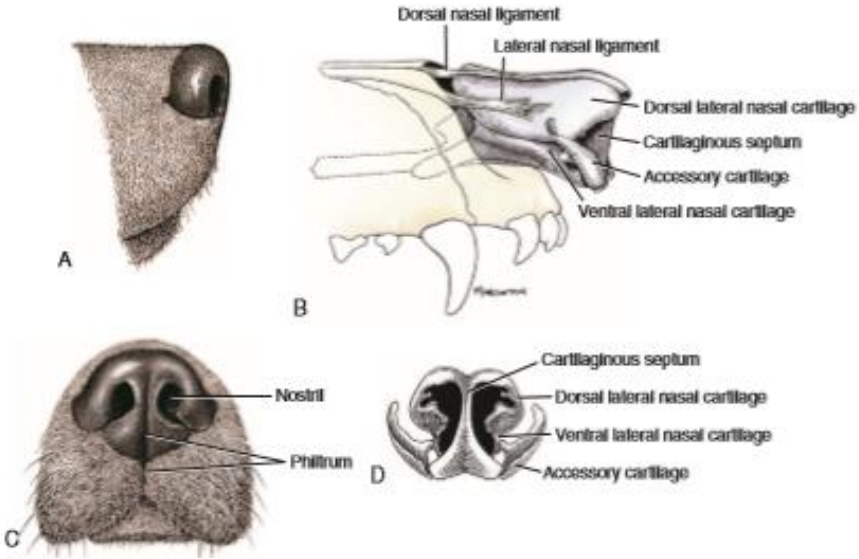


<https://www.petpooskiddoo.com/blog/how-is-a-dogs-sense-of-smell-different-from-ours-and-why/>

OBERE LUFTWEGE NASE (RHIN, NASUS)

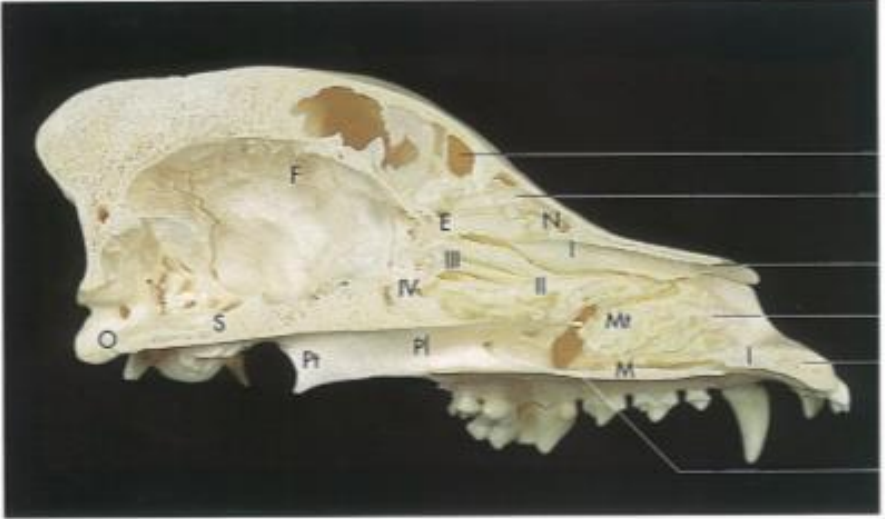
der Begriff NASE umfasst:

1. die Nase mit der Nasenspitze
2. die Nasenhöhle
3. die Nasennebenhöhlen



- E Ethmoid
- F Frontal
- I Incisive
- M Maxilla
- Mt Maxilloturbinate
- N Nasal
- O Occipital
- Pl Palatine
- Pt Pterygoid
- S Sphenoid

- I Endoturbinat I
- II Endoturbinat II
- III Endoturbinat III
- IV Endoturbinat IV



- Frontal sinus
- Septal process of the nasal bone
- Rostral process of the nasal bone
- Nasal process of the incisive bone
- Palatine process of the incisive bone
- Palatine process of the maxilla

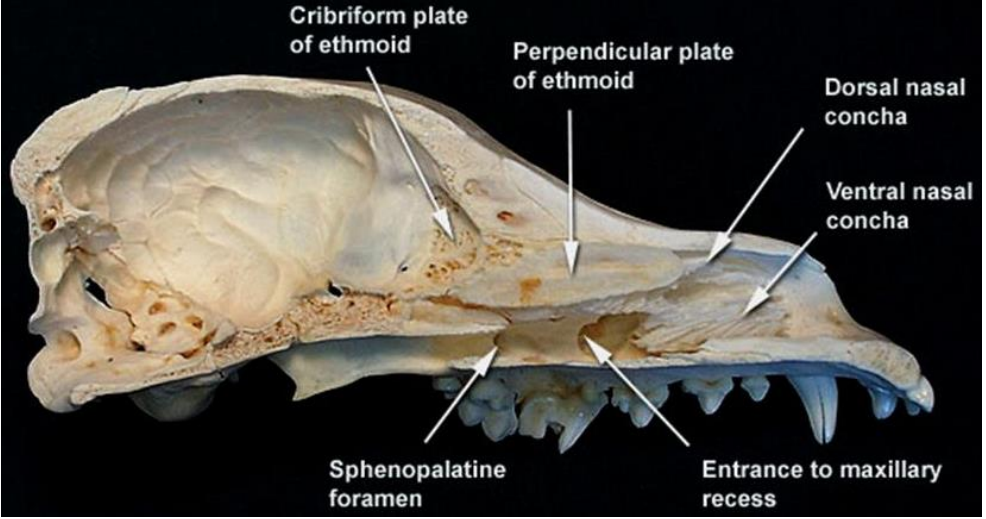


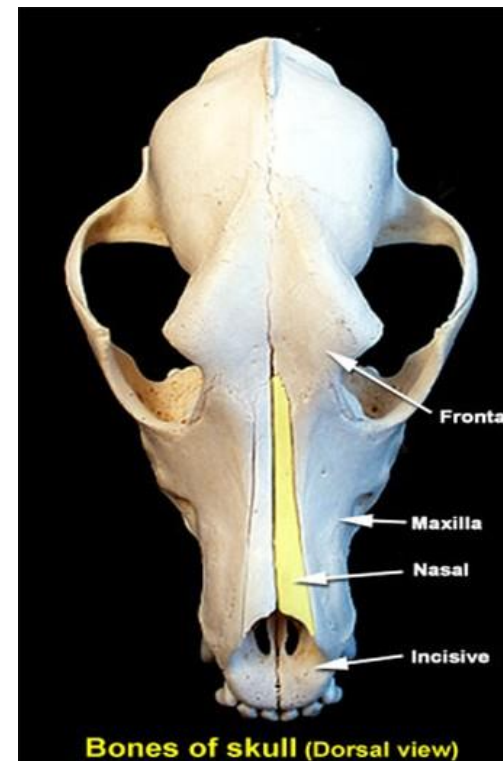
Fig. 1-30. Skull of a dog (medial aspect of sagittal section).

OBERE LUFTWEGE

NASE (RHIN, NASUS)

BEGRENZUNG DER NASE:

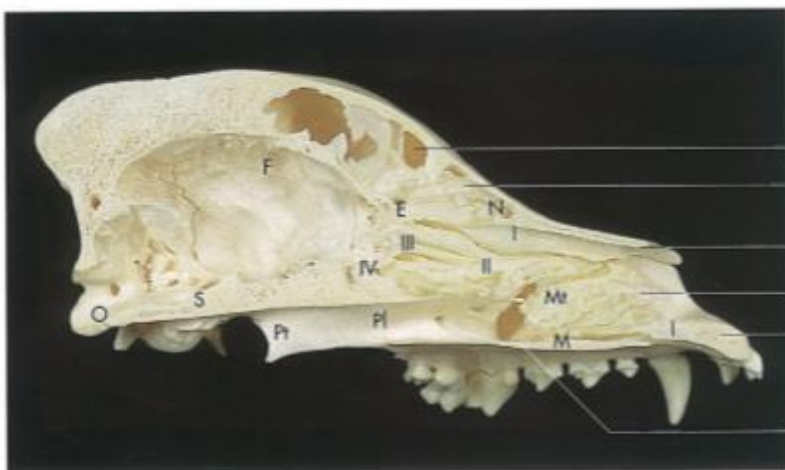
1. dorsal von den Nasenbeinen (Ossa nasalia)
2. lateral von den Oberkieferbeinen (Maxillae)
3. ventral von den Gaumenfortzätzen der Zwischenkiefer – Oberkiefer – Gaumenbeine
4. caudal – Lamina cribrosa des Siebbeins
5. median – knöchere und knorpelige Nasenscheidewand (Septum nasi osseum et cartilagineum)



<https://slideplayer.com/slide/5379039/>

E Ethmoid
F Frontal
I Incisive
M Maxilla
Mt Maxilloturbinate
N Nasal
O Occipital
Pl Palatine
Pt Pterygoid
S Sphenoid

I Endoturbinat I
II Endoturbinat II
III Endoturbinat III
IV Endoturbinat IV

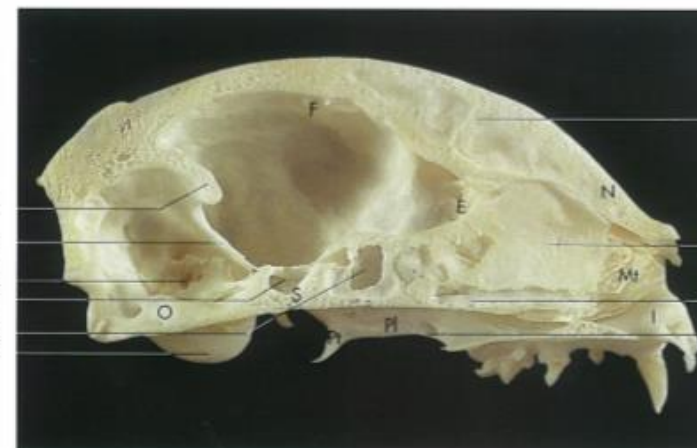


Frontal sinus
Septal process of the nasal bone
Rostral process of the nasal bone
Nasal process of the incisive bone
Palatine process of the incisive bone
Palatine process of the maxilla

Fig. 1-30. Skull of a dog (medial aspect of sagittal section).

E Ethmoid
F Frontal
I Incisive
Mt Maxilloturbinate
N Nasal
O Occipital
Pl Palatine
Pt Pterygoid
S Sphenoid

Osseous tentorium
Crest of the petrous part
Internal acoustic meatus
Hypophyseal fossa
Sphenoidal sinus
Tympanic bulla



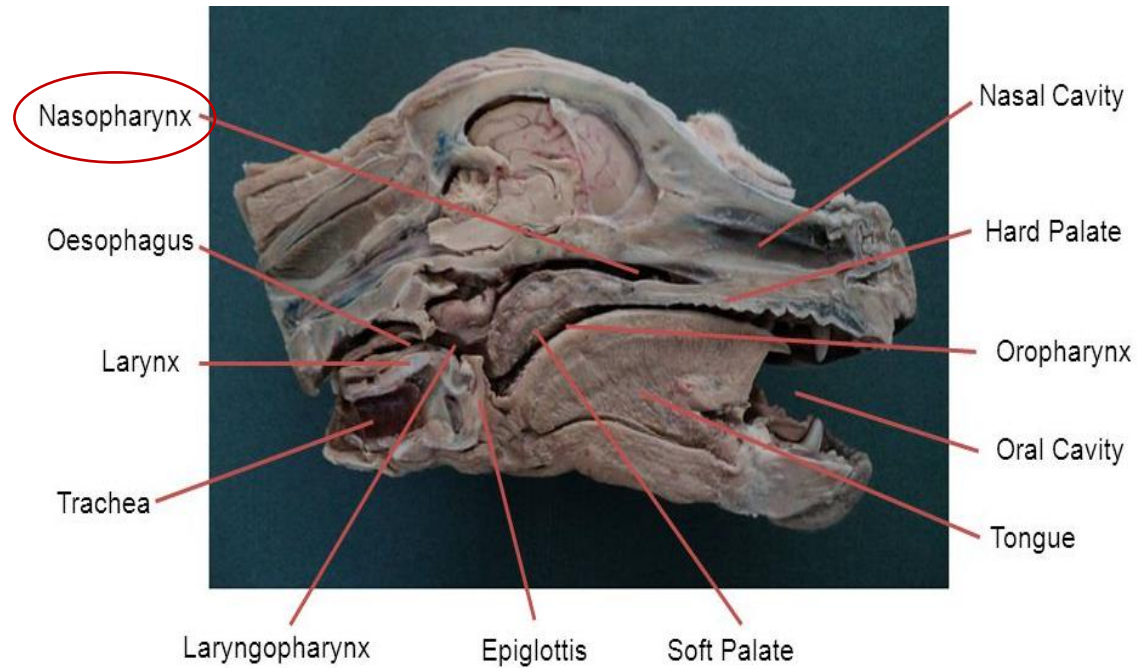
Septum of frontal sinuses
Nasal septum
Vomer
Nasopharyngeal meatus

Fig. 1-49. Skull of a cat (medial aspect of sagittal section).

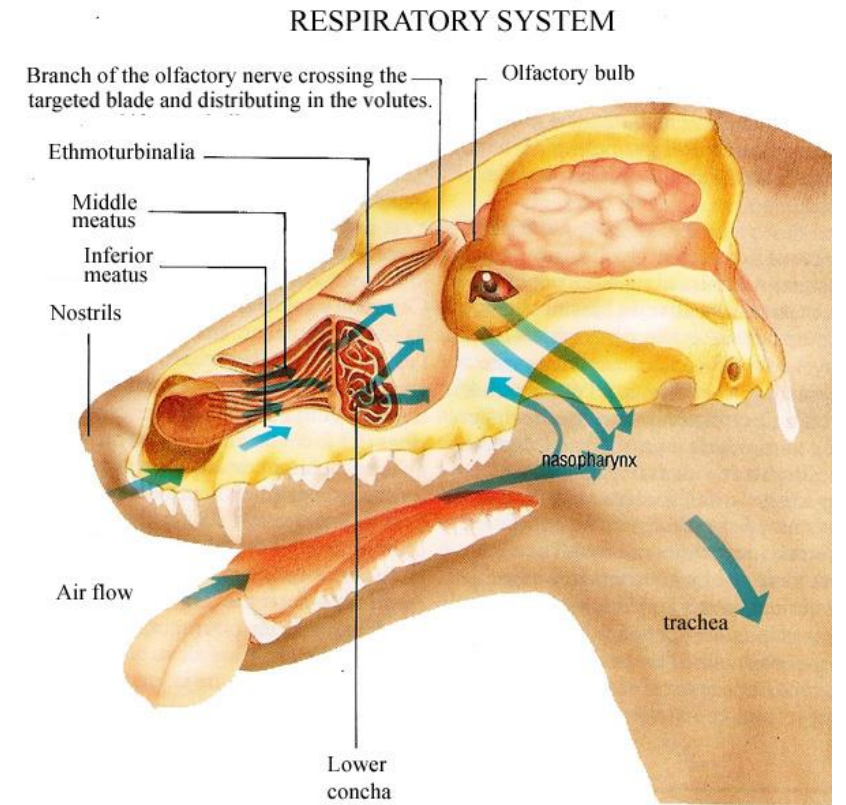
OBERE LUFTWEGE NASE (RHIN, NASUS)

BEGRENZUNG DER NASE:

- ventral geht in den Atmungsrachen (Nasopharynx) über



<https://markylla.eu/the-respiratory-system-nasal-cavity-pharynx-larynx.html>



<http://actiinfochiens.free.fr/RESPIRATORY%20SYSTEM.html>

OBERE LUFTWEGE

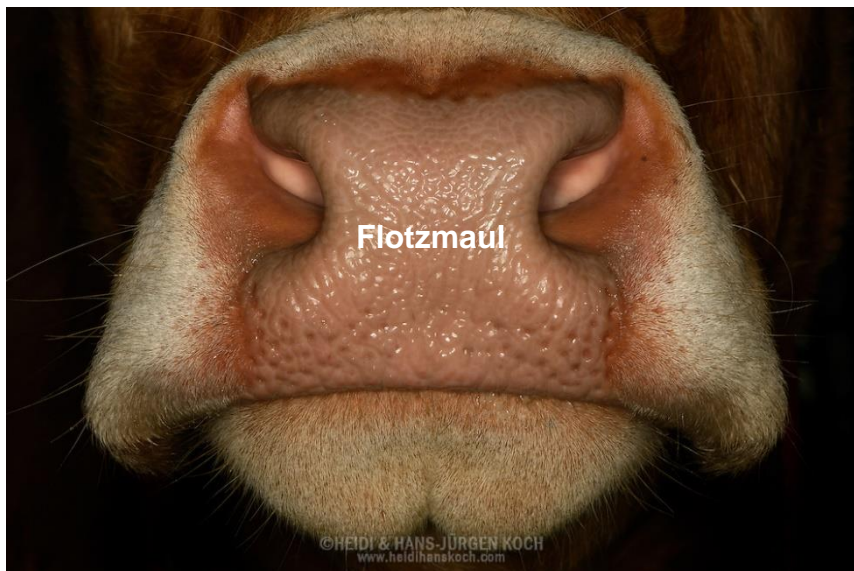
NASE (RHIN, NASUS)

NASENSPITZE (APEX NASI):

- die Kontur der Oberlippe

tierartlich unterschiedlich benannt:

- beim Rind – FLOTZMAUL (Planum nasolabiale)



<https://animal-affairs.photoshelter.com/image/I0000x5qUPX.8Bp4>

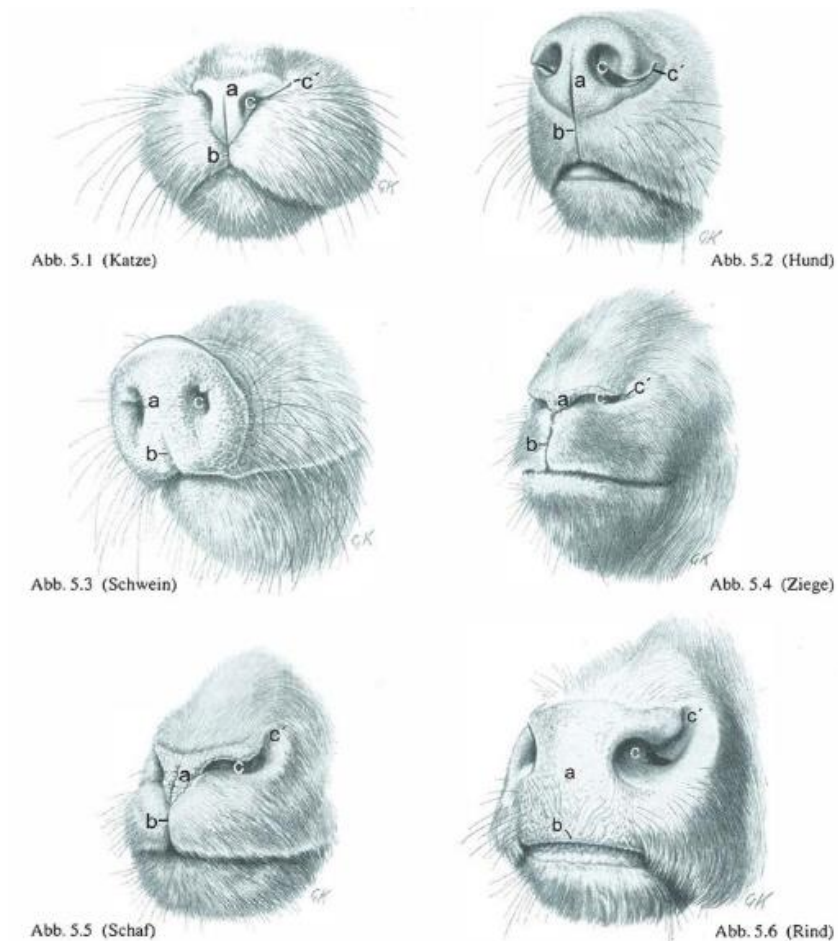
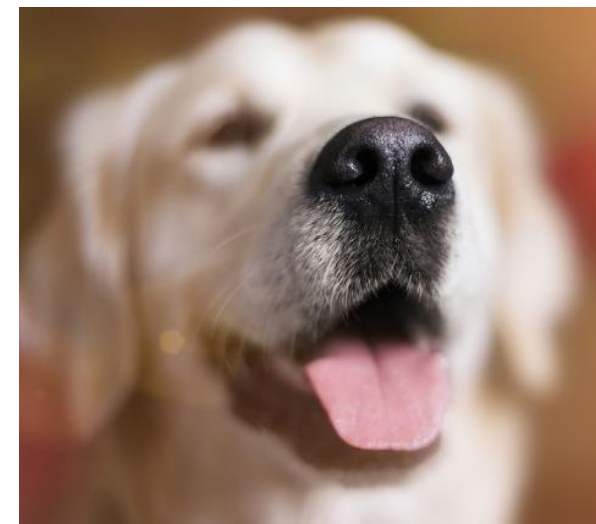


Abb. 5.1–5.6 Naseneingang von *Katze, Hund, Schwein, Ziege, Schaf* und *Rind*. Linke kranio-laterale Ansicht.
 a Planum nasale (*Katze, Hund, Ziege, Schaf*), Planum rostrale (*Schwein*), Planum nasolabiale (*Rind*), Areae, Sulci und Foveolae gut sichtbar; b Philtrum; c Nares, c' Sulcus alaris (exkl. *Schwein*)

<https://www.thieme-connect.de/products/ebooks/pdf/10.1055/b-0037-148410.pdf>



<http://www.einfachtierisch.de/hunde/hunde-gesundheit/warme-trockene-hundenase-ist-der-vierbeiner-krank-id108797/>

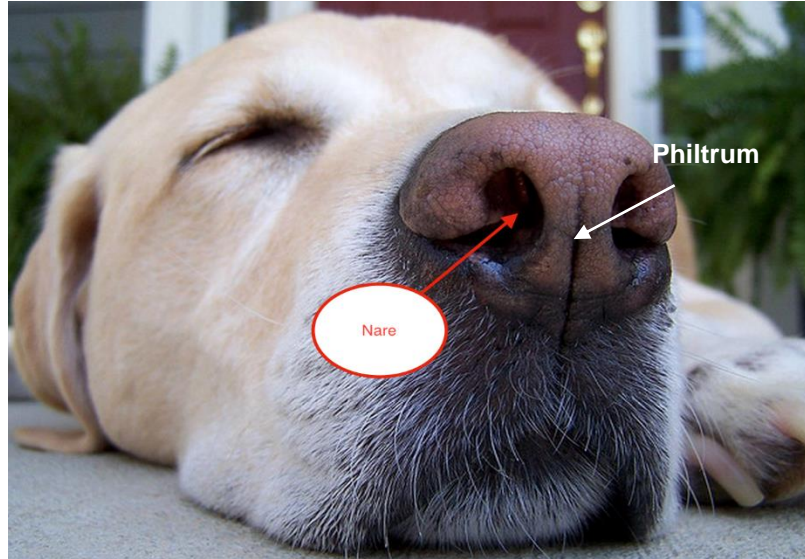
OBERE LUFTWEGE

NASE (RHIN, NASUS)

NASENSPITZE (APEX NASI):

tierartlich unterschiedlich benannt:

- bei den kleinen Wiederkäuern, bei der Katze, beim Hund - **NASENLÖCHER (Nares):**
- vom unbehaarten Nasenspiegel (**Planum nasale**) eingefasst
- in der Medianen durch die auf die Nasenspitze übergreifende **Lippenrinne (Philtrum)** geteilt wird



<https://nationalpurebreddogday.com/external-nares/>

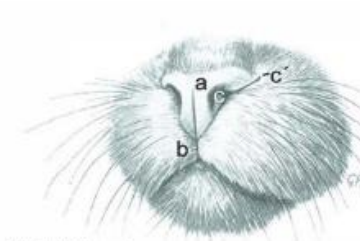


Abb. 5.1 (Katze)

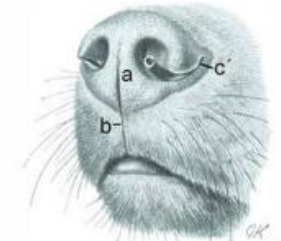


Abb. 5.2 (Hund)

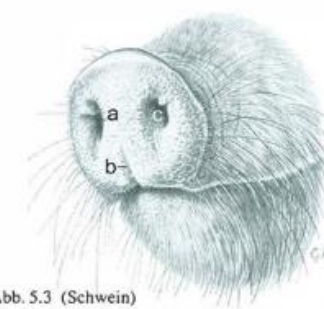


Abb. 5.3 (Schwein)



Abb. 5.4 (Ziege)



Abb. 5.5 (Schaf)

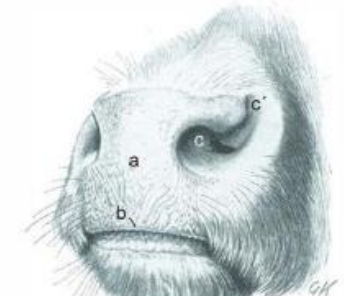


Abb. 5.6 (Rind)

Abb. 5.1–5.6 Naseneingang von *Katze*, *Hund*, *Schwein*, *Ziege*, *Schaf* und *Rind*. Linke kranio-laterale Ansicht.

a Planum nasale (*Katze*, *Hund*, *Ziege*, *Schaf*), Planum rostrale (*Schwein*), Planum nasolabiale (*Rind*), Aerae, Sulci und Foveolae gut sichtbar; b Philtrum; c Nares, c' Sulcus alaris (exkl. *Schwein*)

<https://www.thieme-connect.de/products/ebooks/pdf/10.1055/b-0037-148410.pdf>

OBERE LUFTWEGE

NASE (RHIN, NASUS)

NASENSPITZE (APEX NASI):

tierartlich unterschiedlich benannt:

- beim Schwein – Rüsselscheibe (Planum rostrale)
- mit kurzen Haarstoppeln
- wird von einem Knochen (Os rostrale) gestützt

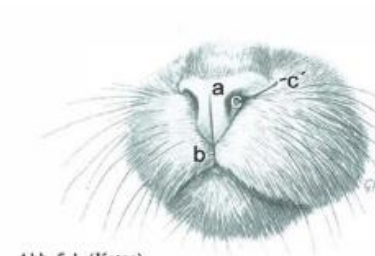


Abb. 5.1 (Katze)

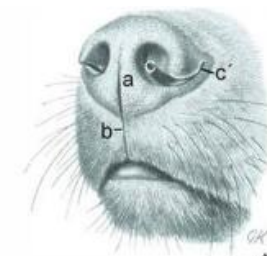


Abb. 5.2 (Hund)

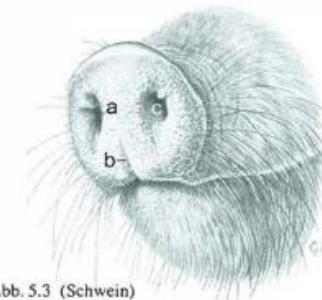


Abb. 5.3 (Schwein)

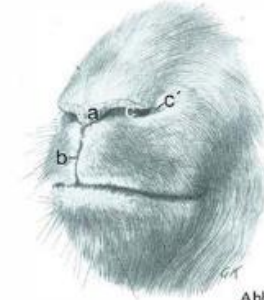


Abb. 5.4 (Ziege)

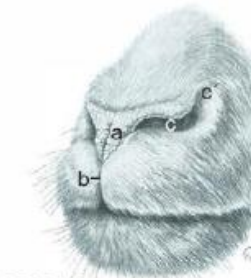


Abb. 5.5 (Schaf)



Abb. 5.6 (Rind)

Abb. 5.1–5.6 Naseneingang von *Katze, Hund, Schwein, Ziege, Schaf* und *Rind*. Linke kraniolaterale Ansicht.

a Planum nasale (*Katze, Hund, Ziege, Schaf*), Planum rostrale (*Schwein*), Planum nasolabiale (*Rind*), *Areae*, *Sulci* und *Foveolae* gut sichtbar; **b** Philtrum; **c** Nares, **c'** Sulcus alaris (exkl. *Schwein*)

<https://www.thieme-connect.de/products/ebooks/pdf/10.1055/b-0037-148410.pdf>

OBERE LUFTWEGE

NASE (RHIN, NASUS)

NASENSPITZE (APEX NASI):

tierartlich unterschiedlich benannt:

- beim Pferd – Nüstern
- fein behaart



<https://pixabay.com/de/photos/pferd-n%C3%BCstern-schnauze-fase-reiten-2743641/>

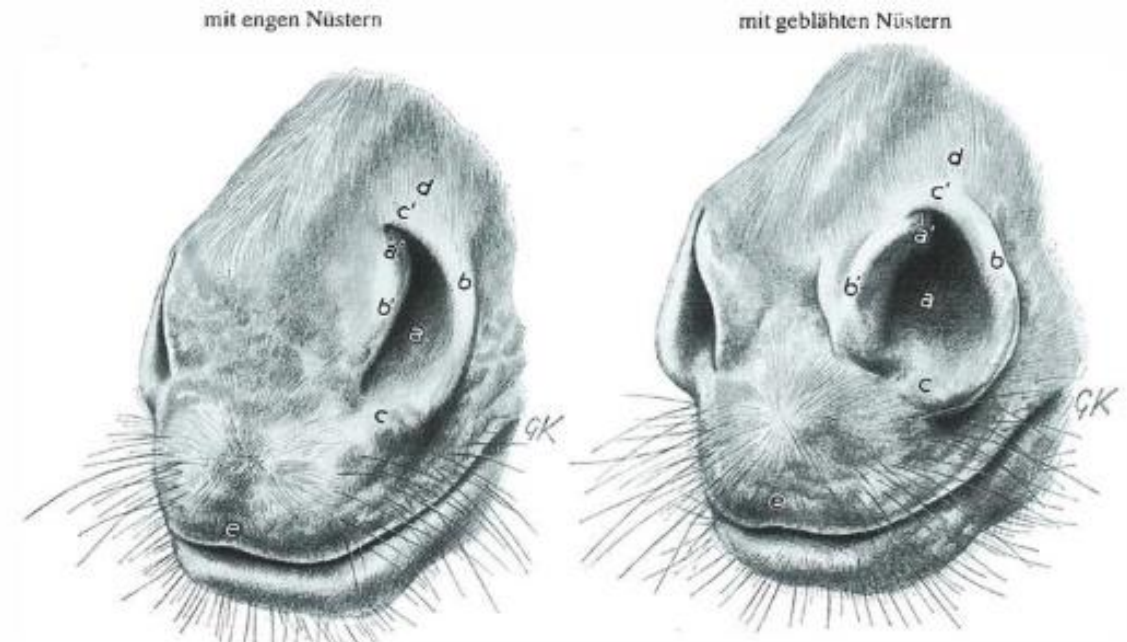


Abb. 5.7, 5.8 Naseneingang eines *Pferdes*. Linke kranio-laterale Ansicht.

■ Naris, ■' Eingang in die Nasentrompete, Diverticulum nasi; b laterale, b' mediale Ala nasi; c ventraler, c' dorsaler Winkel des Nasenlochs; d Diverticulum nasi; e Philtrum

<https://www.thieme-connect.de/products/ebooks/pdf/10.1055/b-0037-148410.pdf>

OBERE LUFTWEGE

NASE (RHIN, NASUS)

NASENSPIEGEL (PLANUM NASALE):

- beim Rind und beim Schwein – wird durch eingelagerte Drüsenpakete feucht gehalten
- beim Hund, bei der Katze – das Secret stammt aus der im Recessus maxillaris gelegenen lateralen Nasendrüse



Nasenspiegel eines **Haushundes**



Nasenspiegel einer **Hauskatze**

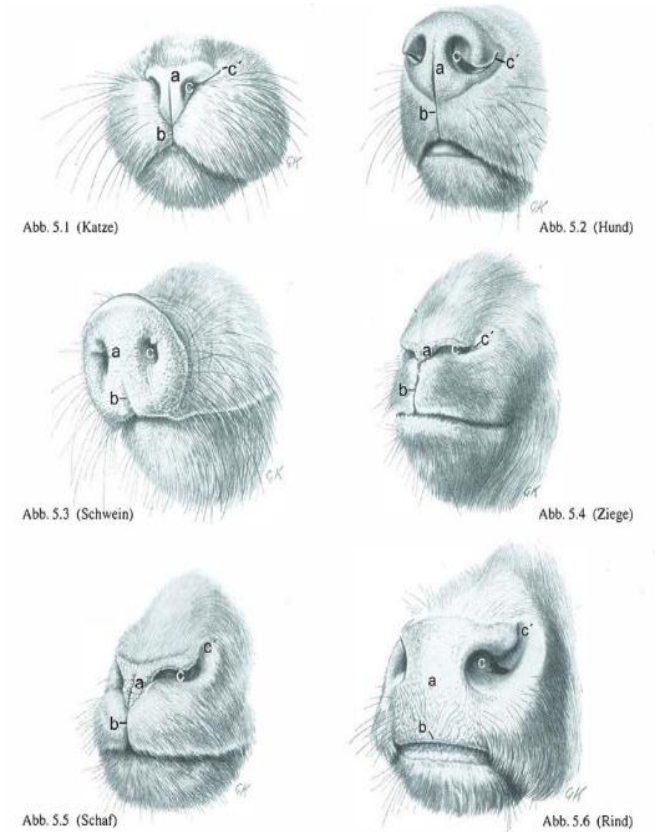
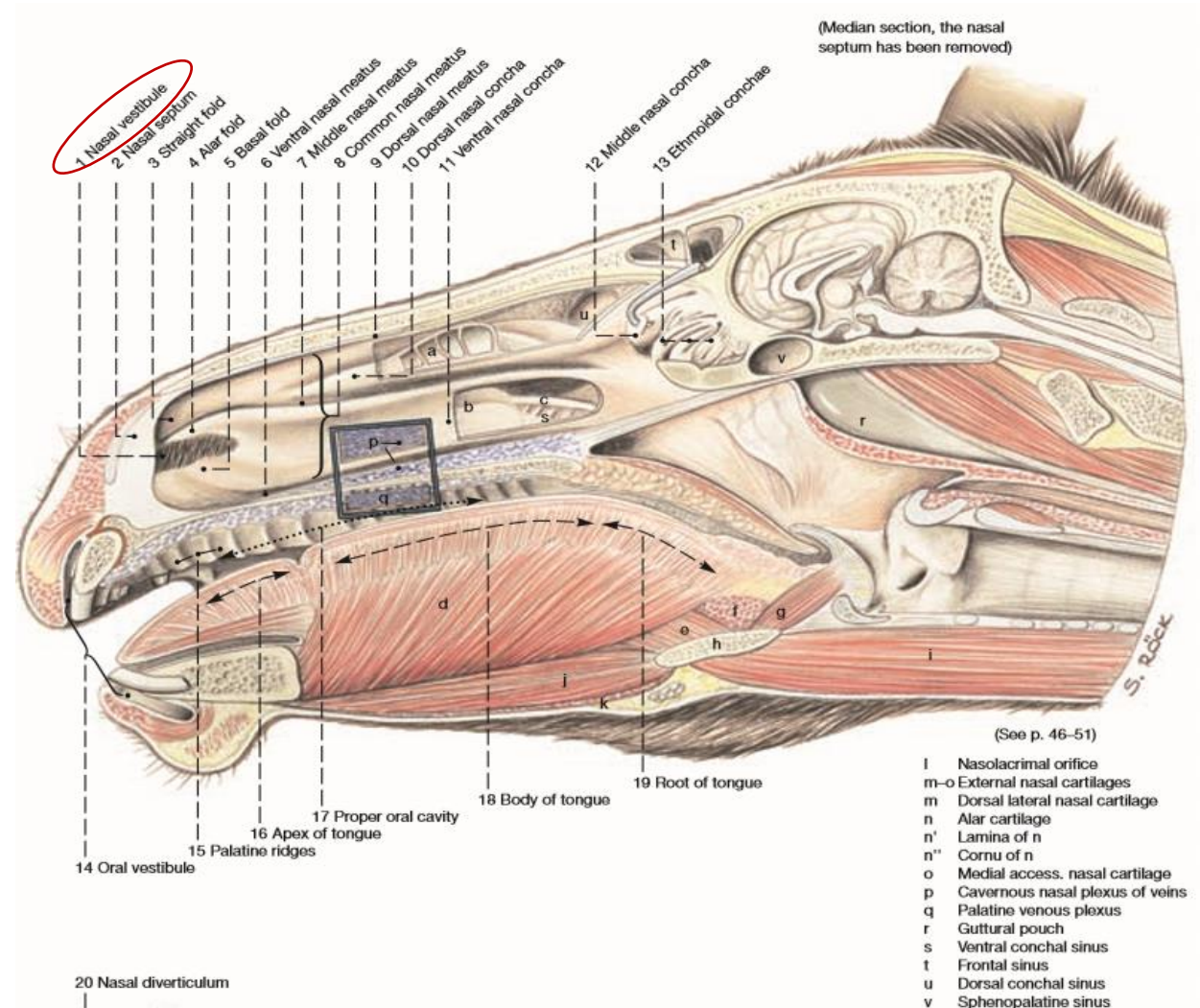


Abb. 5.1–5.6 Naseneingang von *Katze*, *Hund*, *Schwein*, *Ziege*, *Schaf* und *Rind*. Linke kranio-laterale Ansicht.
a Planum nasale (*Katze*, *Hund*, *Ziege*, *Schaf*), Planum rostrale (*Schwein*), Planum nasolabiale (*Rind*), Areea, Sulci und Foveolae gut sichtbar; b Philtrum; c Nares, c' Sulcus alaris (exkl. *Schwein*)

OBERE LUFTWEGE NASE (RHIN, NASUS)

NASENHÖHLEN (CAVA NASI):

1. Vestibulum nasi (Anfangsteil)
2. Cavum nasi proprium (Hauptteil)
3. Conchae nasales (Nasenmuschel)
4. Conchae ethmoidales (Siebbeinmuschel)
5. Nasengrund – kaudodorsal liegt
6. Meatus nasopharyngeus (Nasenrachengang)– kaudoventral leitet über die Choane in den Nasenrachen (Pars nasalis pharyngis) über



OBERE LUFTWEGE

NASE (RHIN, NASUS)

NASENVORHOF (VESTIBULUM NASI):

- die äußere pigmentierte Haut setzt sich im Nasenvorhof fort
- Limen nasi – Grenze zwischen der Haut und Nasenschleimhaut
- öffnet sich im Bereich der äußeren Haut beim Pferd der Tränen – Nasen – Gang (Ductus nasolacrimalis)

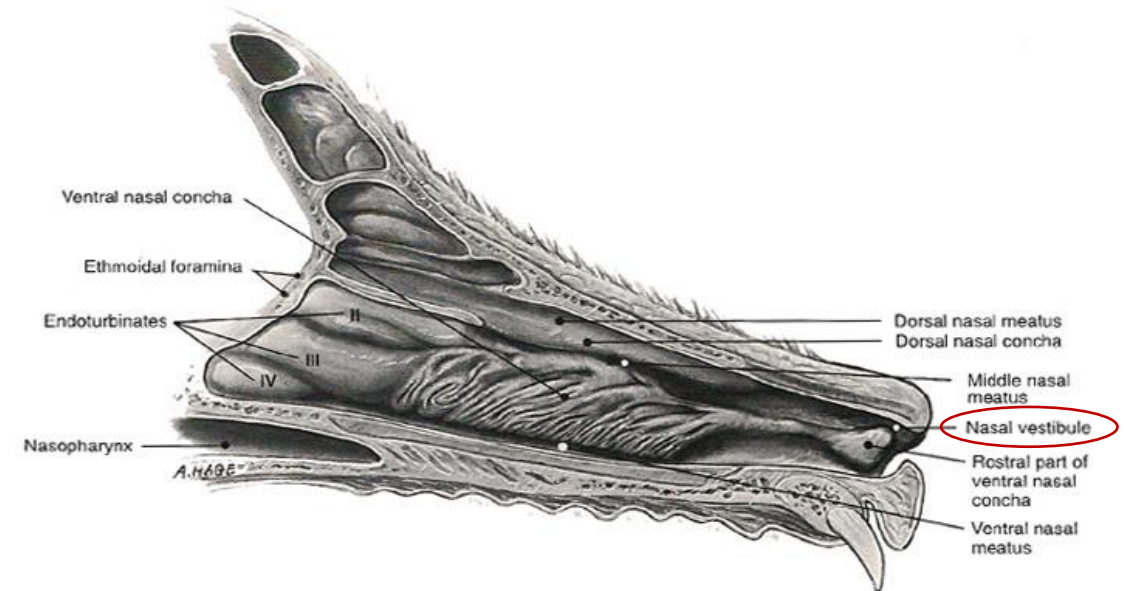
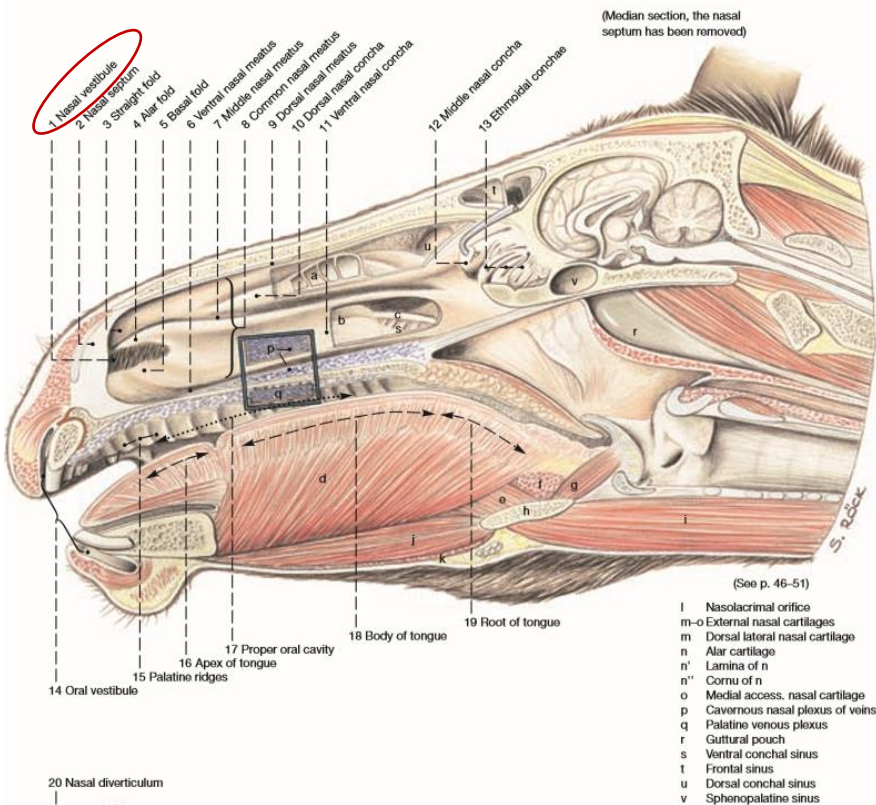


FIG. 1-87 The ventral nasal concha (parasagittal sectional view). The ventral nasal concha (formerly maxilloturbinate) is attached to the inner surface of the maxilla at the conchal crest. The concha continues rostrally into the nasal vestibule as a mucous-membrane-covered, knob-like structure. The ventral nasal concha is a separately formed bone distinct from the ethmoid bone.

<http://actinfochiens.free.fr/RESPIRATORY%20SYSTEM.html>

OBERE LUFTWEGE

NASE (RHIN, NASUS)

NASENHÖHLEN (CAVA NASI):

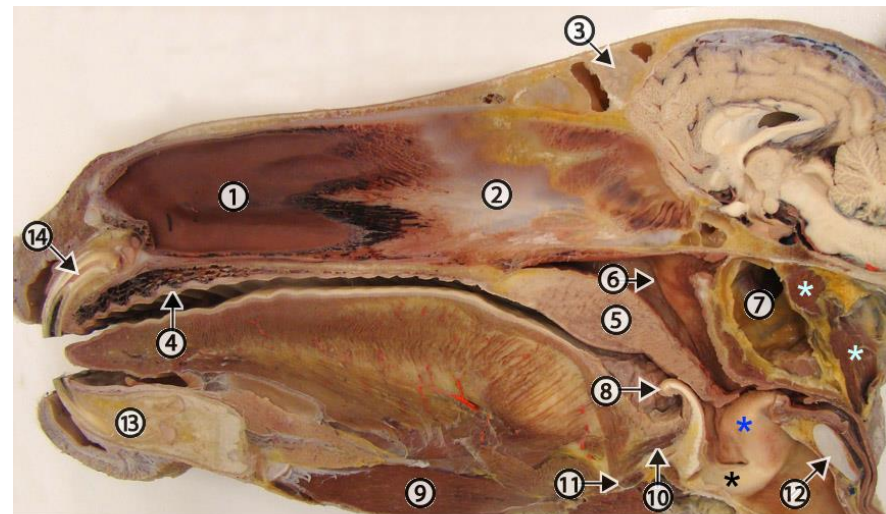
REGIO RESPIRATORIA:

1. Cavum nasi proprium

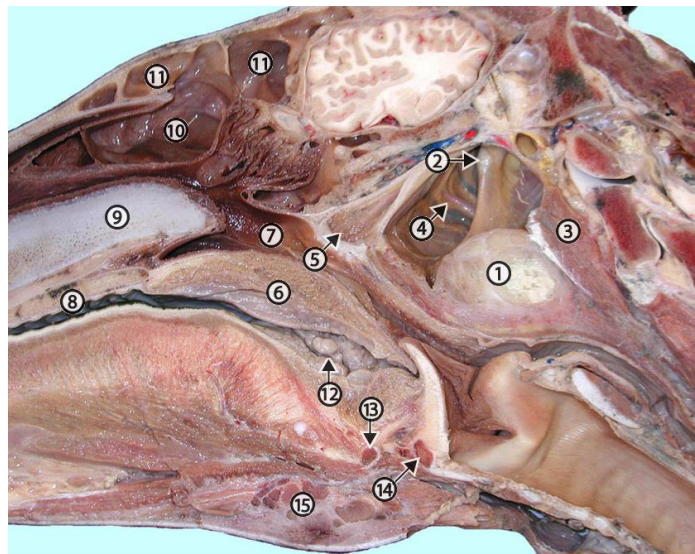
2. Septum nasi

- tragen Atmungsschleimhaut

- Gefäßplexus - Erwärmung und durch Abdunstung des Drüsensekrets des Dampfättigung der eingeatmeten Luft dienen

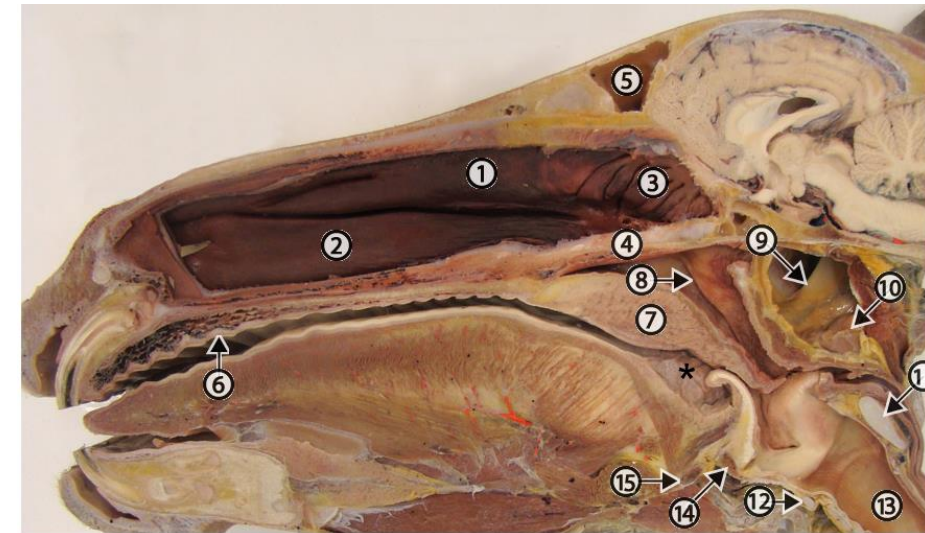


Midline view of split equine head. 1, nasal septum covered with mucosa; 2, cartilage of the nasal septum; 3, midline bony septum between frontal sinuses; 4, hard palate; 5, soft palate; 6, orifice of auditory tube (entrance to guttural pouch); 7, inferior of guttural pouch; light blue asterisk, longus capitis m., blue asterisk, arytenoid cartilage covered with mucosa; black asterisk, vocal fold; 8, epiglottis; 9, geniopharyngeus m., 10, hyoepiglottis m.; 11, basihyoid bone; 12, cricoid cartilage; 13, mandibular symphysis; 14, pulp cavity.



Equine split head with a large strangles abscess (1) on the ventral aspect of the guttural pouch. 2, temporohyoid joint; 3, longus capitis m.; 4, maxillary artery; 5, auditory tube; 6, soft palate; 7, nasopharynx; 8, hard palate; 9, cartilage of nasal septum; 10, dorsal conchal sinus; 11, frontal sinus; 12, palatine tonsil; 13, basihyoid bone; 14, ossified rostral edge of the thyroid cartilage; 15, mandibular lymph nodes.

<http://vanat.cvm.umn.edu/ungDissect/Lab20/Lab20.html>



Equine split head after removal of the nasal septum to expose the nasal cavity. 1, dorsal concha; 2, ventral concha; 3, ethmoidal conchae; 4, vomer (bone); 5, frontal sinus; 6, hard palate; 7, soft palate; 8, orifice of the auditory tube on the lateral wall of the nasopharynx. At this place, an endoscope can be passed into the guttural pouch. 9, stylohyoid bone; 10, medial retropharyngeal lymph nodes adjacent to the ventral wall of the guttural pouch; 11, cricoid cartilage; 12, cricoid cartilage (ventral), 13, trachea; 14, ossified rostral edge of the thyroid cartilage; 15, basihyoid bone; asterisk, palatine tonsil.

OBERE LUFTWEGE

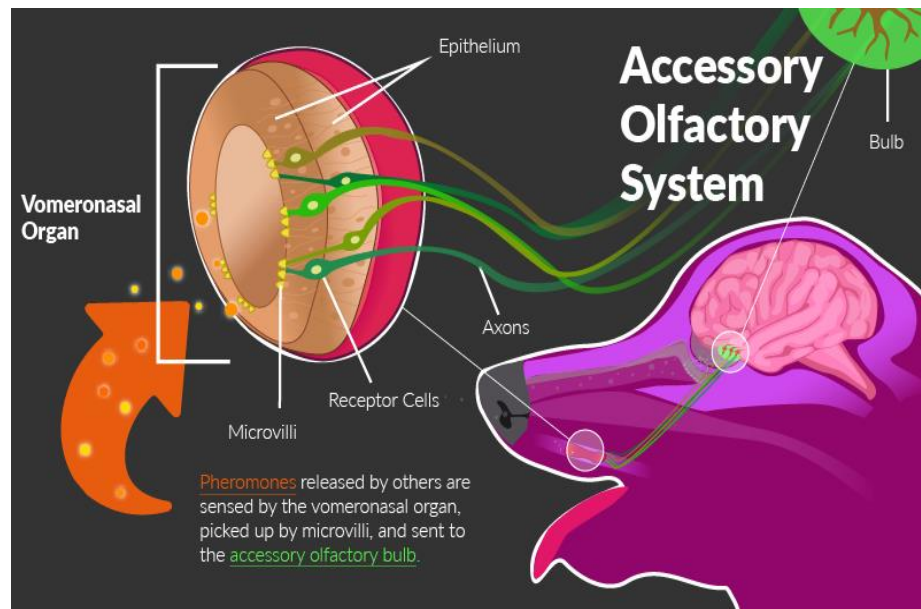
NASE (RHIN, NASUS)

NASENHÖHLEN (CAVA NASI):

REGIO OLFACTORIA:

1. Nasengrund

- Riechschleimhaut



<https://www.petpooskiddoo.com/blog/how-is-a-dogs-sense-of-smell-different-from-ours-and-why/>



Figure 1. Lateral view of the nasal septum of an adult dog, showing the difference in color between sensory (yellow-brown) and respiratory (red-orange) mucosa. The rectangle frames the vomeronasal organ. Scale bar: 2 cm (see Figure S1).

<https://www.frontiersin.org/articles/10.3389/fnana.2014.00106/full>

OBERE LUFTWEGE

NASE (RHIN, NASUS)

NASENMUSCHELN (CONCHAE NASALES):

- knöchere Grundlage – Muschelbeine

MUSCHELBEINE besitzen:

1. BASALLAMELLE – an den Schädelknochen befestigt
2. SPIRALLAMELLEN – Muschelwulst, Aufrollung

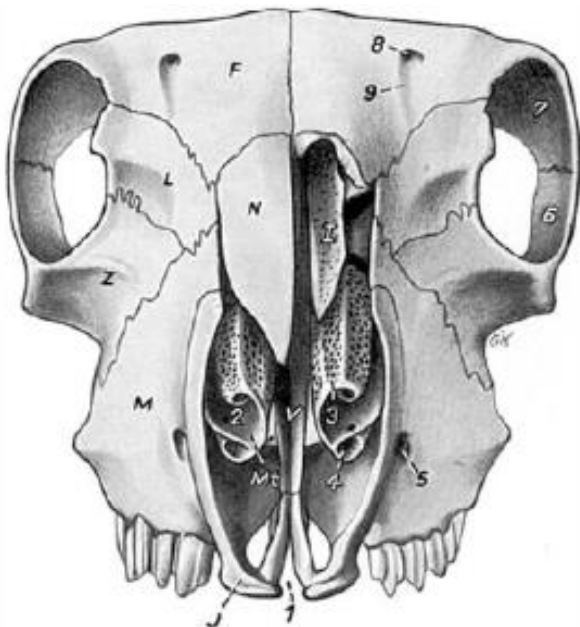


Abb.267. Schädel des Schafes. Ansicht von vorn. Linkes Nasenbein entfernt.

F Os frontale; I Os incisivum; L Os lacrimale;
M Maxilla; Mt Os conchae nasalis ventralis;
N Os nasale; V Vomer; Z Os zygomaticum

I linkes erstes Endoturbinale

1 Fiss. interincisiva; 2 Basallamelle des rechten Os conchae nasalis ventralis; 3 dorsale, 4 ventrale Spirallamelle des linken Os conchae nasalis ventralis; 5 For. infraorbitale; 6 Proc. frontalis des Zygomaticum; 7 Proc. zygomaticus des Frontale; 8 For. supraorbitale; 9 Sulcus supraorbitalis

<https://www.thieme-connect.de/products/ebooks/pdf/10.1055/b-0037-148384.pdf>

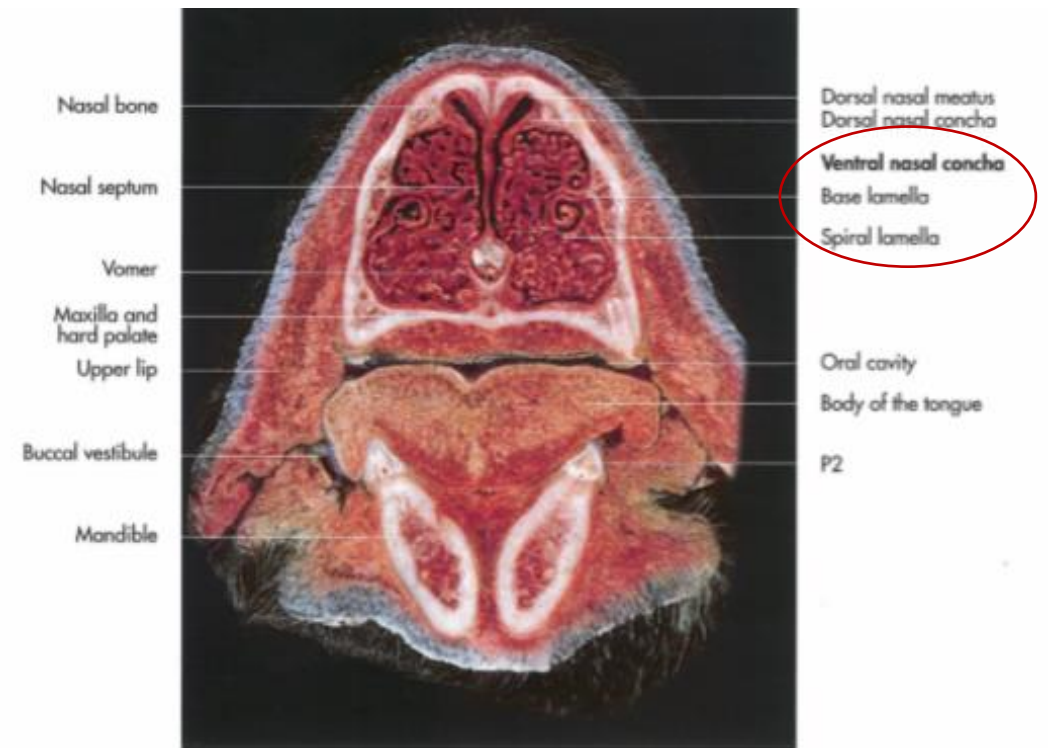


Fig. 8-7. Transverse section of the head of a dog at the level of the second premolar, frontal aspect (courtesy of PD Dr. J. Maierl, Munich).

OBERE LUFTWEGE

NASE (RHIN, NASUS)

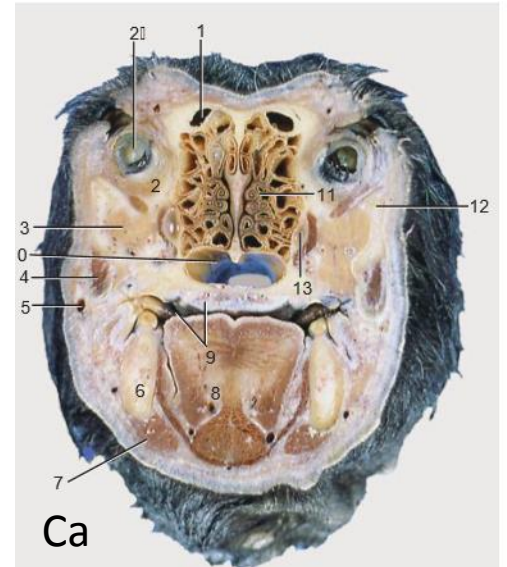
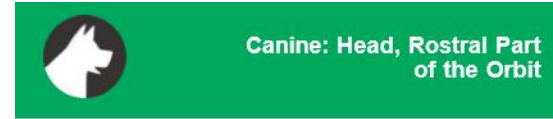
NASENMUSCHELN (CONCHAE NASALES):

1. SPIRALLEMELLEN:

- grenzen die Nasenmuschel Buchten, Recessus ab
- an ihrem freien Rand bilden die Spirallamellen Bullae (Blasen)
- die Bullae durch quergestellte Wände noch Cellulae unterteilt sein können

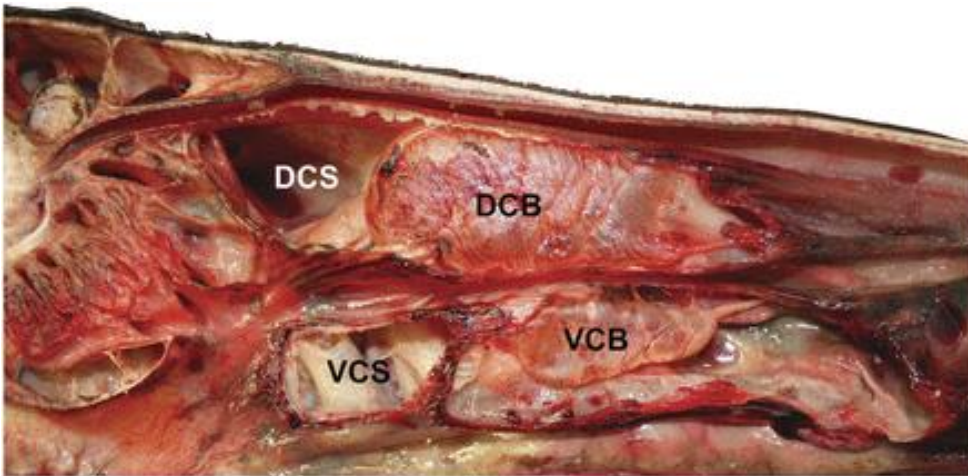


Fig. 8-10. Paramedian section of the head of a dog, medial aspect (courtesy of PD Dr. J. Maierl, Munich).



Ca

1. Frontal sinus
2. Orbital structures
- 2'. Eye
3. Zygomatic gland
4. Masseter
5. Facial vein
6. Mandible
7. Digastricus
8. Tongue
9. Oral cavity and hard palate
10. Choana
11. Ethmoid turbinates
12. Zygomatic arch
13. Maxillary recess



The medial aspect of the left side of an equine head following excision of the nasal septum and the medial wall of spiral lamellae of both nasal conchae, illustrating the dorsal conchal sinus (DCS), ventral conchal sinus (VCS), dorsal conchal bulla (DCB) and ventral conchal bulla (VCB)



The medial aspect of a left dorsal conchal bulla following excision of its medial wall. Five vertically oriented septae divide the bulla into six cellulae

<https://veterinaryrecord.bmj.com/content/177/21/542>

OBERE LUFTWEGE NASE (RHIN, NASUS)

NASENMUSCHELN (CONCHAE NASALES):

SINUS CONCHAE:

- der freie Rand der Spirallamellen kann mit der Basallamellen oder mit benachbarten Kopfknochen verwachsen sein

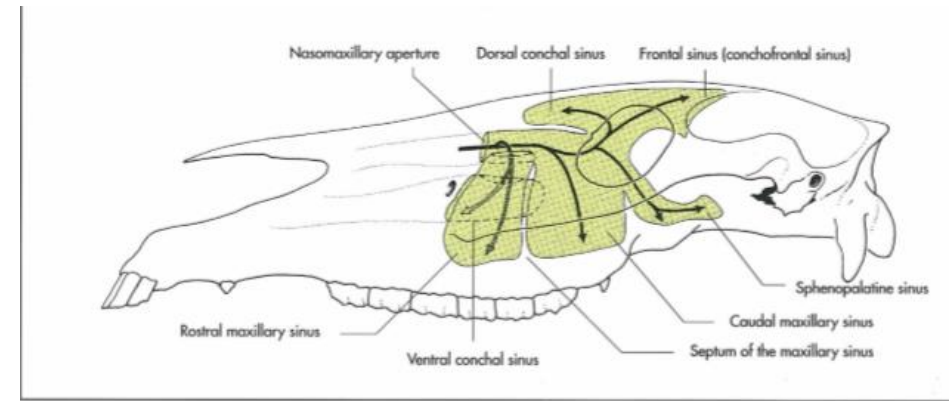
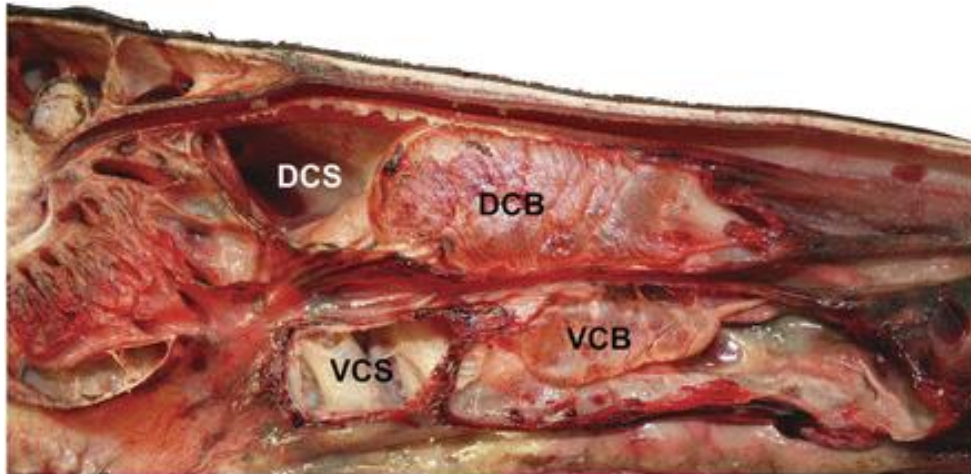


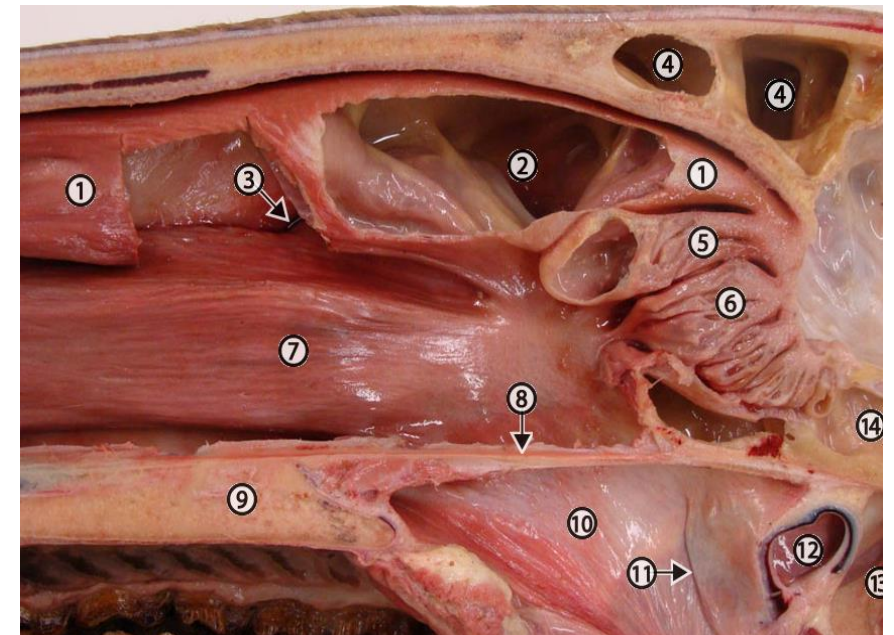
Fig. 8-12. Paranasal sinuses of the horse, schematic.



The medial aspect of the left side of an equine head following excision of the nasal septum and the medial wall of spiral lamellae of both nasal conchae, illustrating the dorsal conchal sinus (DCS), ventral conchal sinus (VCS), dorsal conchal bulla (DCB) and ventral conchal bulla (VCB)



The medial aspect of a left dorsal conchal bulla following excision of its medial wall. Five vertically oriented septae divide the bulla into six cellulae

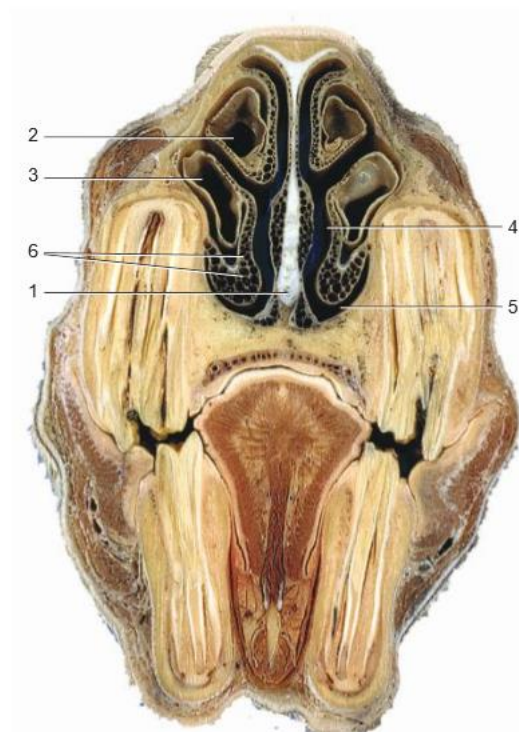


Split equine head. 1, dorsal concha (ethmoconcha I); 2, dorsal conchal sinus; 3, nasomaxillary aperture; 4, frontal sinus; 5, ethmoconcha II; 6, ethmoconcha III; 7, ventral concha; 8, vomer; 9, hard palate; 10, lateral wall of the nasopharynx; 11, entrance to the auditory tube and guttural pouch; 12, lumen of the auditory tube; 13, guttural pouch; 14, sphenopalatine sinus.

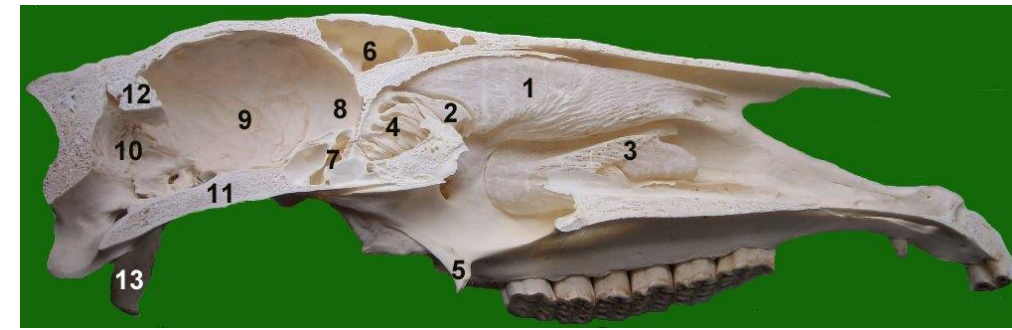
OBERE LUFTWEGE NASE (RHIN, NASUS)

NASENMUSCHELN (CONCHAE NASALES):

1. CONCHA NASALIS DORSALIS
2. CONCHA NASALIS MEDIA
3. CONCHA NASALIS VENTRALIS
4. CONCHAE ETHMIODALES



1. Nasal septum
2. Dorsal concha
3. Ventral concha
4. Common meatus
5. Ventral meatus
6. Venous plexus in nasal mucosa



- 1 : Concha nasalis dorsalis
- 2 : Concha nasalis media
- 3 : Concha nasalis ventralis

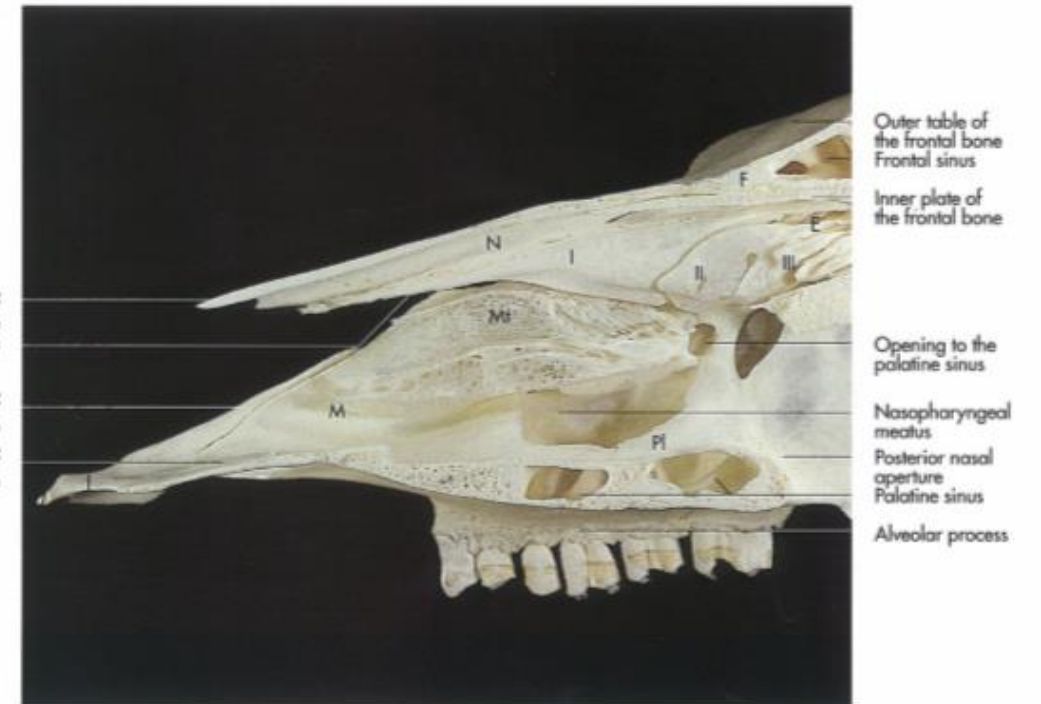
http://www.wikiwand.com/en/Nasal_concha

E Ethmoid
F Frontal
I Incisive
M Maxilla
Mt Maxilloturbinate
N Nasal
Pl Palatine

I Endoturbinat I
II Endoturbinat II
III Endoturbinat III

Rostral process of the nasal bone
Nasoincisive notch

Nasal process of the incisive bone
Palatine process of the incisive bone



Outer table of the frontal bone
Frontal sinus
Inner plate of the frontal bone

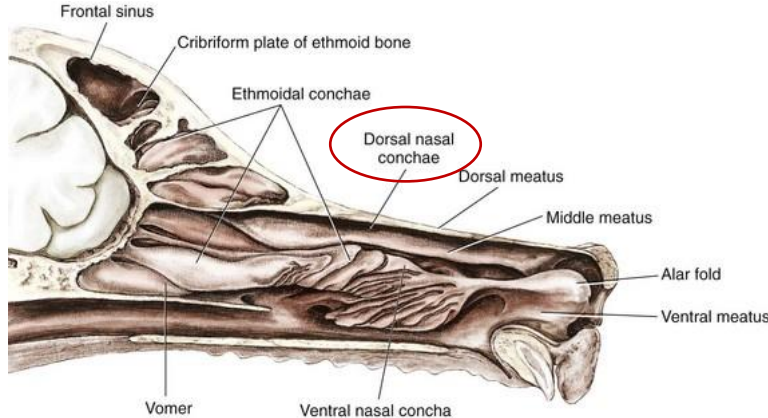
Opening to the palatine sinus

Nasopharyngeal meatus
Posterior nasal aperture
Palatine sinus
Alveolar process

Fig. 1-32. Bones of the facial part of an equine skull (medial aspect of sagittal section).

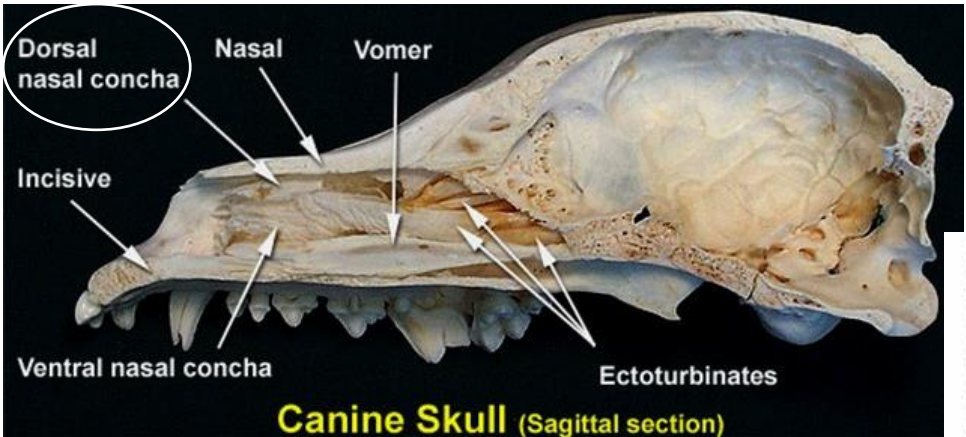
OBERE LUFTWEGE

NASE (RHIN, NASUS)



OS CONCHA NASALIS DORSALIS (DORSALE NASENMUSCHEL):

- knöchere Grundlage für Endoturbinale I. - im Nasenbereich an der Crista ethmoidalis des Os nasale befestigt
- in die Nasenhöhle rostral vorragend



<https://slideplayer.com/slide/5379039/>

- E Ethmoid
- F Frontal
- I Incisive
- M Maxilla
- Mt Maxilloturbinate
- N Nasal
- O Occipital
- Pl Palatine
- Pt Pterygoid
- S Sphenoid

- I Endoturbinat I
- II Endoturbinat II
- III Endoturbinat III
- IV Endoturbinat IV

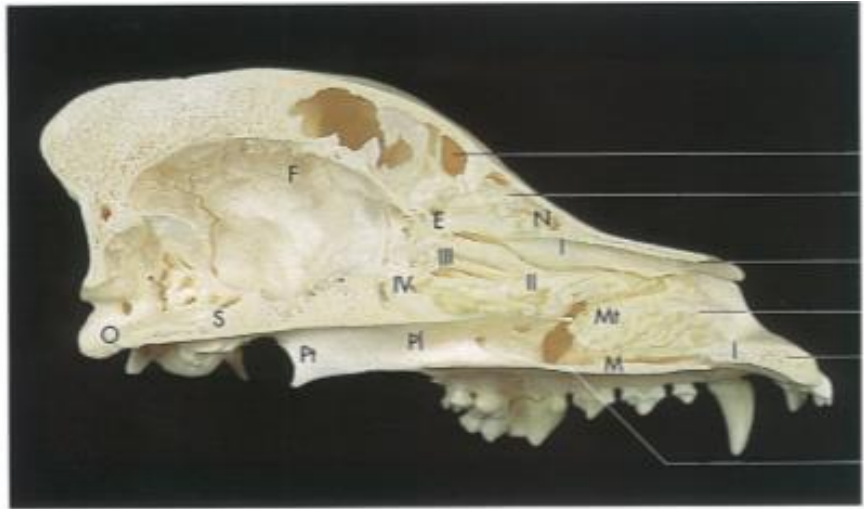


Fig. 1-30. Skull of a dog (medial aspect of sagittal section).

OBERE LUFTWEGE

NASE (RHIN, NASUS)

OS CONCHA NASALIS MEDIA (MITTLERER NASENMUSCHEL):

- bei Schwein, Pferd klein – beschränkt sich auf kaudalen Teil der Nasenhöhle
- dient das Endoturbinale II als knöcherner Stütze

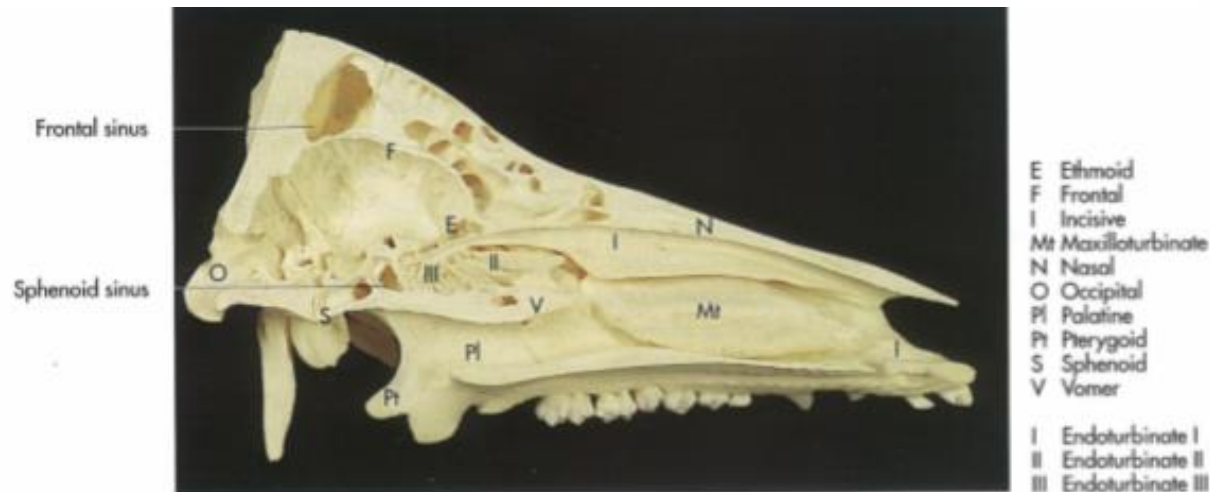


Fig. 1-31. Skull of a pig (medial aspect of sagittal section).

E Ethmoid
F Frontal
I Incisive
M Maxilla
Mt Maxilloturbinate
N Nasal
Pl Palatine

I Endoturbinale I
II Endoturbinale II
III Endoturbinale III

Rostral process of the nasal bone
Nasoincisive notch

Nasal process of the incisive bone
Palatine process of the incisive bone

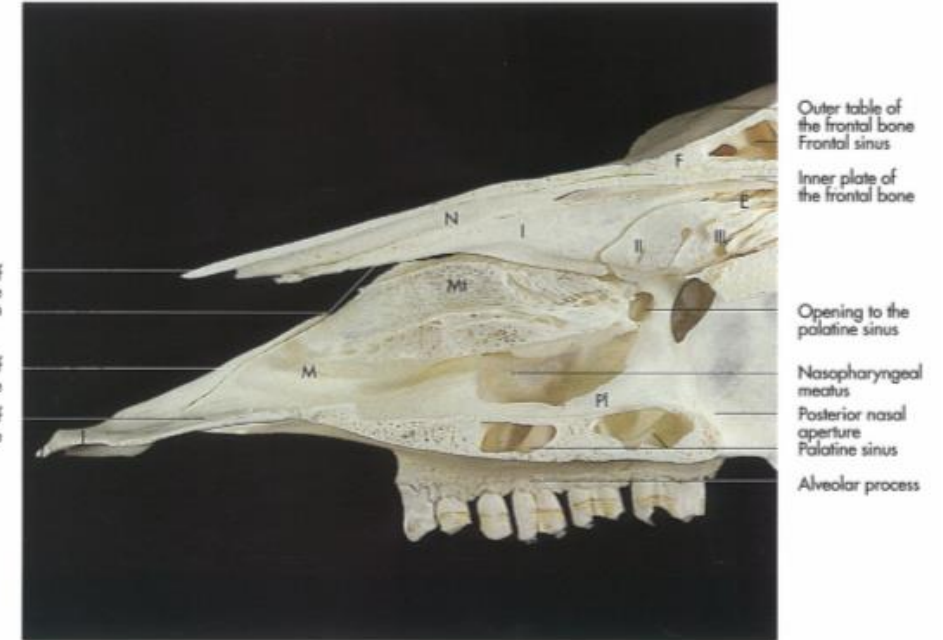


Fig. 1-32. Bones of the facial part of an equine skull (medial aspect of sagittal section).

OBERE LUFTWEGE

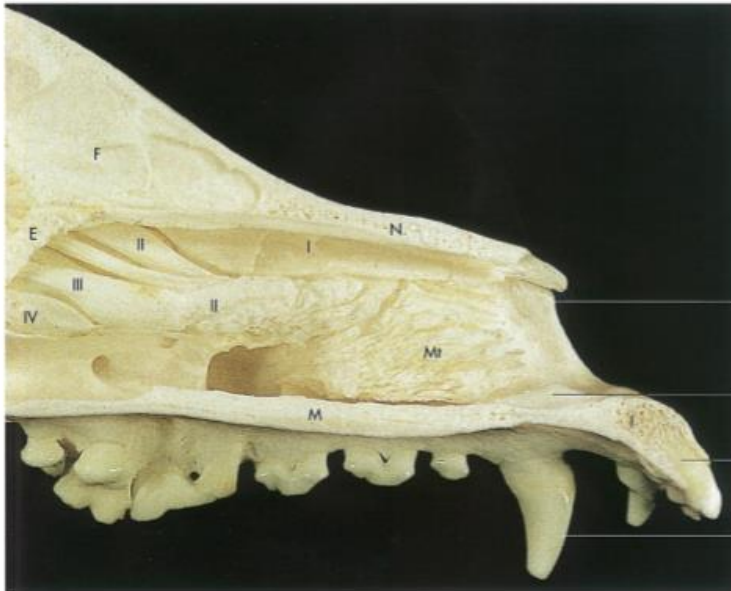
NASE (RHIN, NASUS)

OS CONCHA NASALIS MEDIA (MITTLERER NASENMUSCHEL):

- beim Hund, bei der Katze – besonders entwickelt – wiet rostral reicht
- dient das Endoturbinale II als knöcherner Stütze

F Frontal
E Ethmoid
I Incisive
M Maxilla
Mt Ventral nasal concha
N Nasal

I Endoturbinate I
II Endoturbinate II
III Endoturbinate III
IV Endoturbinate IV



Nasal process of the incisive bone
Palatine process of the incisive bone
Body of the incisive bone
Canine

Fig. 1-23. Bones of the facial part of a canine skull (medial aspect of sagittal section).

E Ethmoid
F Frontal
N Nasal
Mt Maxilloturbinate
O Occipital
Pl Palatine
Pt Pterygoid
S Sphenoid

Tentorium osseum
Internal acoustic meatus
Sphenoidal sinus
Foramen magnum
Occipital condyle

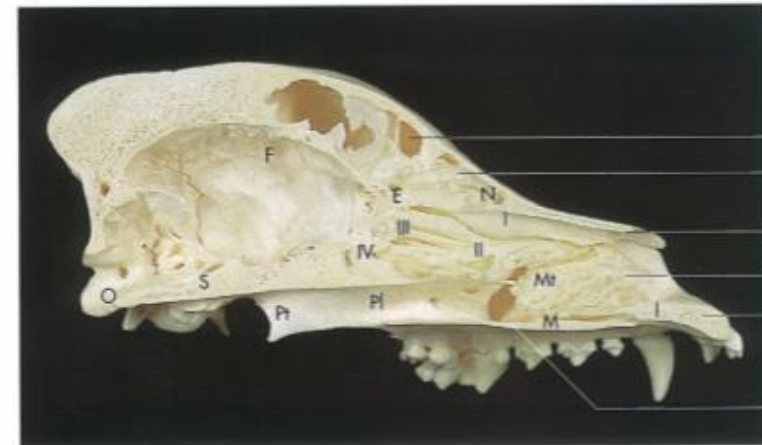


Frontal sinus
Ectoturbinate II
Dorsal nasal concha
Cribriform plate of the ethmoid bone
Middle nasal concha
Ventral nasal concha
Remnant of nasal septum
Vomer
Nasopharyngeal meatus

Fig. 1-29. Skull of a cat (medial aspect of sagittal section).

E Ethmoid
F Frontal
I Incisive
M Maxilla
Mt Maxilloturbinate
N Nasal
O Occipital
Pl Palatine
Pt Pterygoid
S Sphenoid

I Endoturbinate I
II Endoturbinate II
III Endoturbinate III
IV Endoturbinate IV



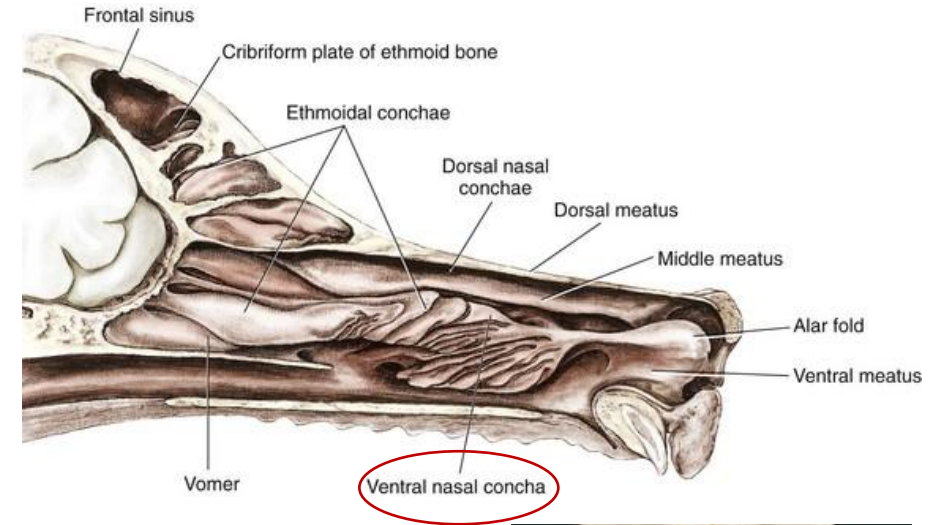
Frontal sinus
Septal process of the nasal bone
Rostral process of the nasal bone
Nasal process of the incisive bone
Palatine process of the incisive bone
Palatine process of the maxilla

Fig. 1-30. Skull of a dog (medial aspect of sagittal section).

OBERE LUFTWEGE NASE (RHIN, NASUS)

OS CONCHAE NASALIS VENTRALIS:

- knöchere Grundlage der ventralen Nasenmuschel (Concha nasalis ventralis, Maxilloturbinate)
- an der Crista conchalis der Maxilla
- gehört nicht zum Siebbein



- E Ethmoid
- F Frontal
- I Incisive
- M Maxilla
- Mt Maxilloturbinate
- N Nasal
- Pl Palatine

- I Endoturbinat I
 - II Endoturbinat II
 - III Endoturbinat III
- Rostral process of the nasal bone
Nasoincisive notch
- Nasal process of the incisive bone
Palatine process of the incisive bone

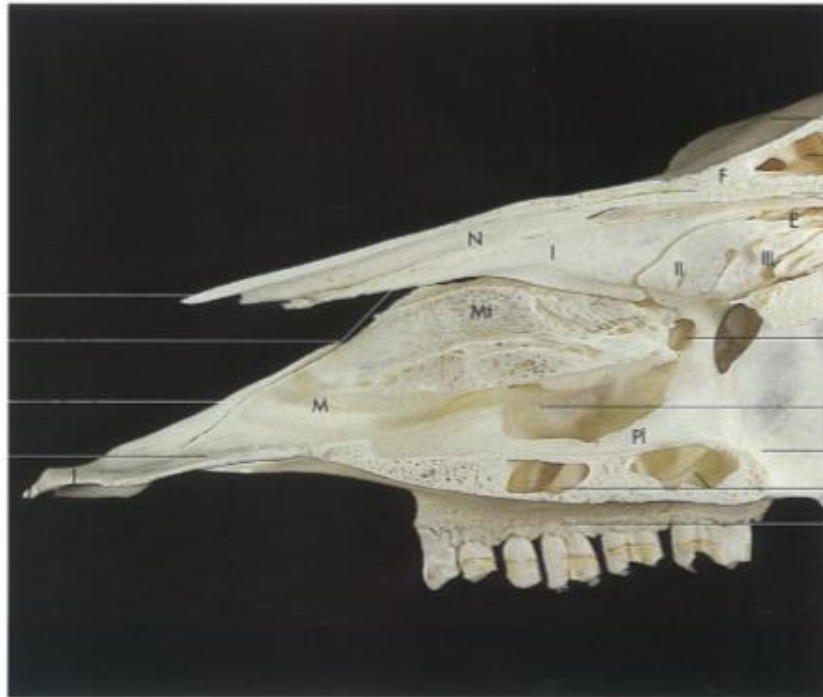


Fig. 1-32. Bones of the facial part of an equine skull (medial aspect of sagittal section).

- F Frontal
 - E Ethmoid
 - I Incisive
 - M Maxilla
 - Mt Ventral nasal concha
 - N Nasal
- I Endoturbinat I
 - II Endoturbinat II
 - III Endoturbinat III
 - IV Endoturbinat IV

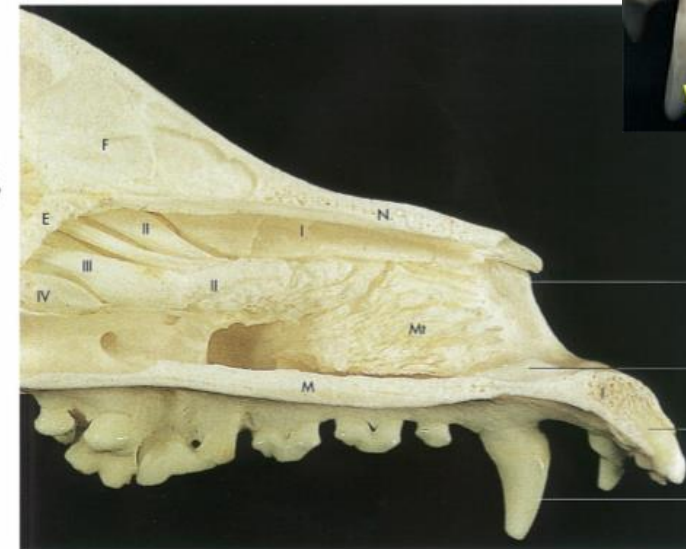
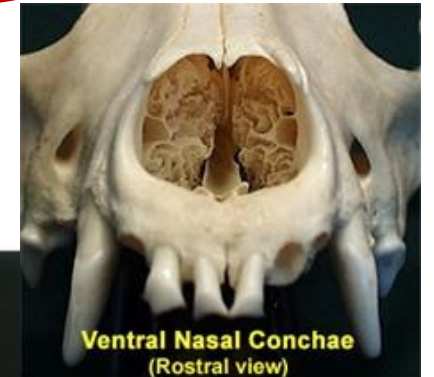


Fig. 1-23. Bones of the facial part of a canine skull (medial aspect of sagittal section).



<https://slideplayer.com/slide/5379039/>

- Nasal process of the incisive bone
- Palatine process of the incisive bone
- Body of the incisive bone
- Canine

OBERE LUFTWEGE NASE (RHIN, NASUS)

CONCHAE ETHMIODALES (SIEBBEINMUSCHELN):

- den Nasengrund ausfüllen

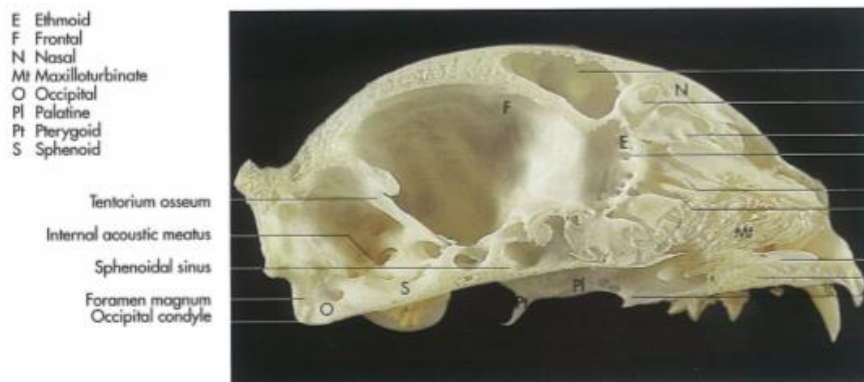
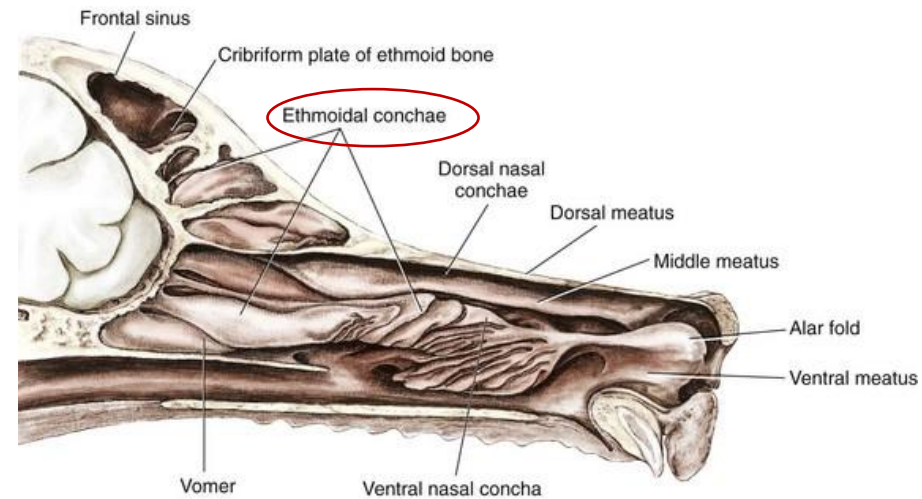


Fig. 1-29. Skull of a cat (medial aspect of sagittal section).



Fig. 1-30. Skull of a dog (medial aspect of sagittal section).



Fig. 1-31. Skull of a pig (medial aspect of sagittal section).

OBERE LUFTWEGE NASE (RHIN, NASUS)

NASENGÄNGE (MEATUS NASI):

- Zwischenräume, zwischen den Muscheln, bezeichnet man als Nasengänge

1. MEATUS NASI DORSALIS
2. MEATUS NASI MEDIUS
3. MEATUS NASI VENTRALIS

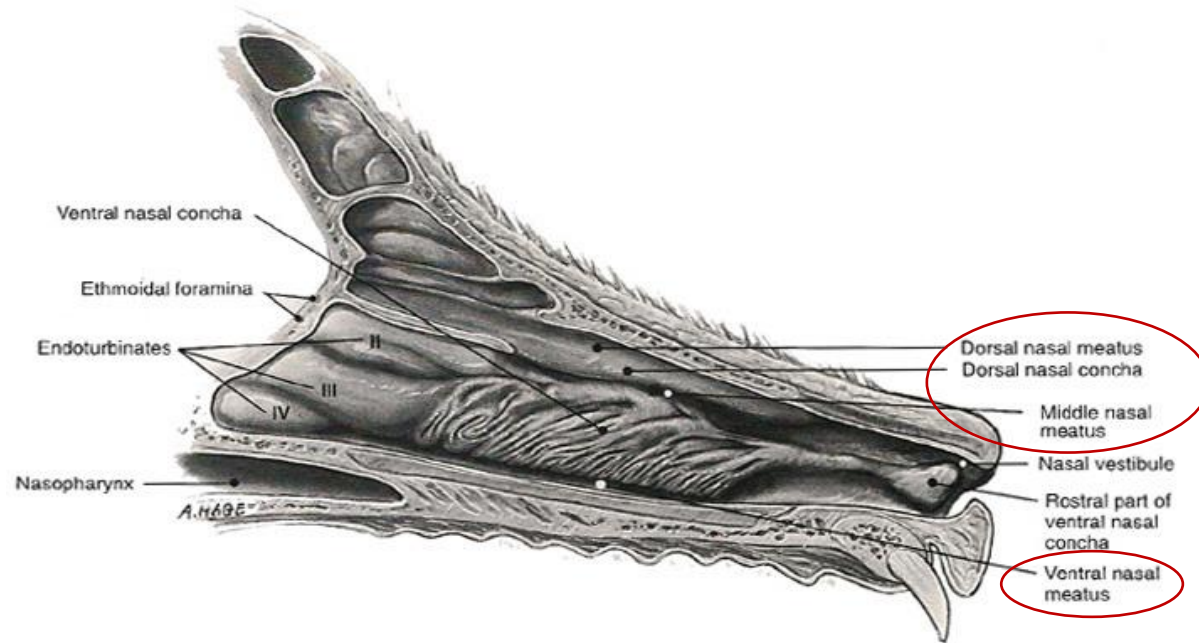
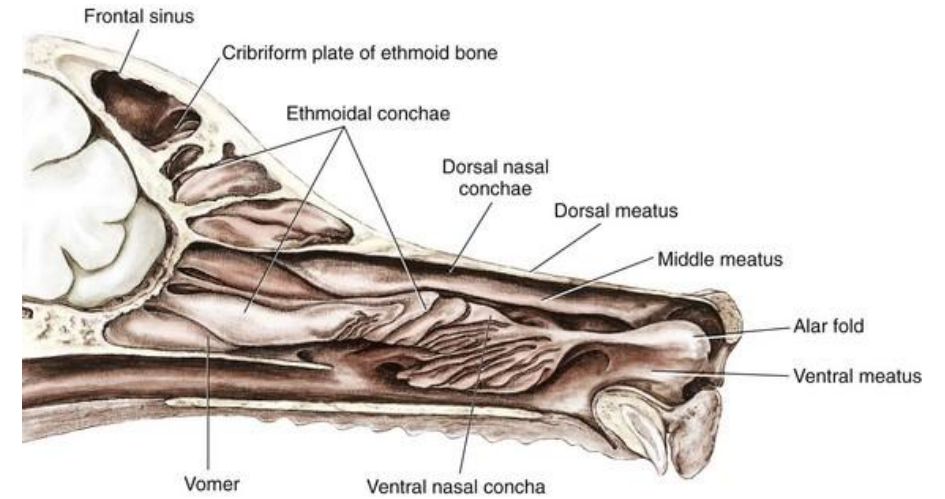


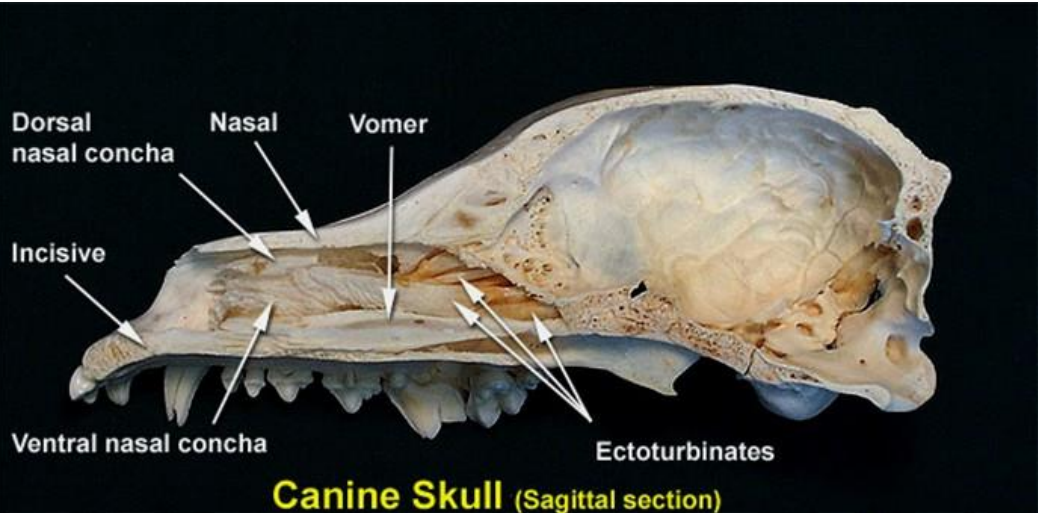
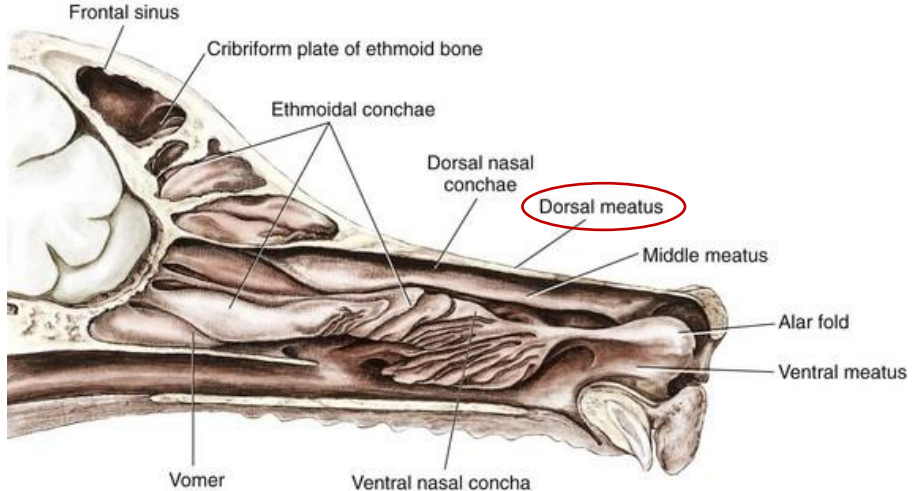
FIG. 1-87 The ventral nasal concha (parasagittal sectional view). The ventral nasal concha (formerly maxilloturbinate) is attached to the inner surface of the maxilla at the conchal crest. The concha continues rostrally into the nasal vestibule as a mucous-membrane-covered, knob-like structure. The ventral nasal concha is a separately formed bone distinct from the ethmoid bone.

OBERE LUFTWEGE

NASE (RHIN, NASUS)

MEATUS NASI DORSALIS (DORSALER NASENGANG):

- führt zwischen Nasendach und dorsaler Muschel zum Riechorgan
- als **Riechgang** bezeichnet



<https://slideplayer.com/slide/5379039/>

- E Ethmoid
 - F Frontal
 - I Incisive
 - M Maxilla
 - Mt Maxilloturbinate
 - N Nasal
 - O Occipital
 - Pl Palatine
 - Pt Pterygoid
 - S Sphenoid
-
- I Endoturbinat I
 - II Endoturbinat II
 - III Endoturbinat III
 - IV Endoturbinat IV

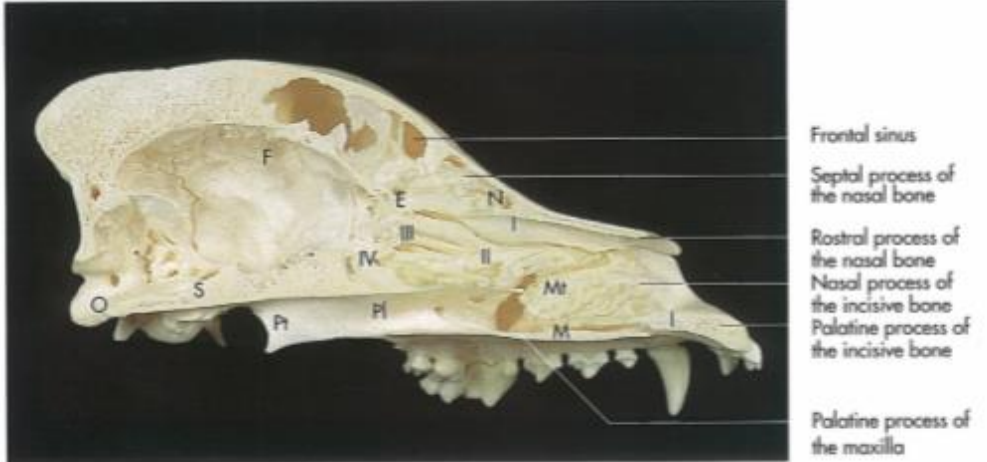
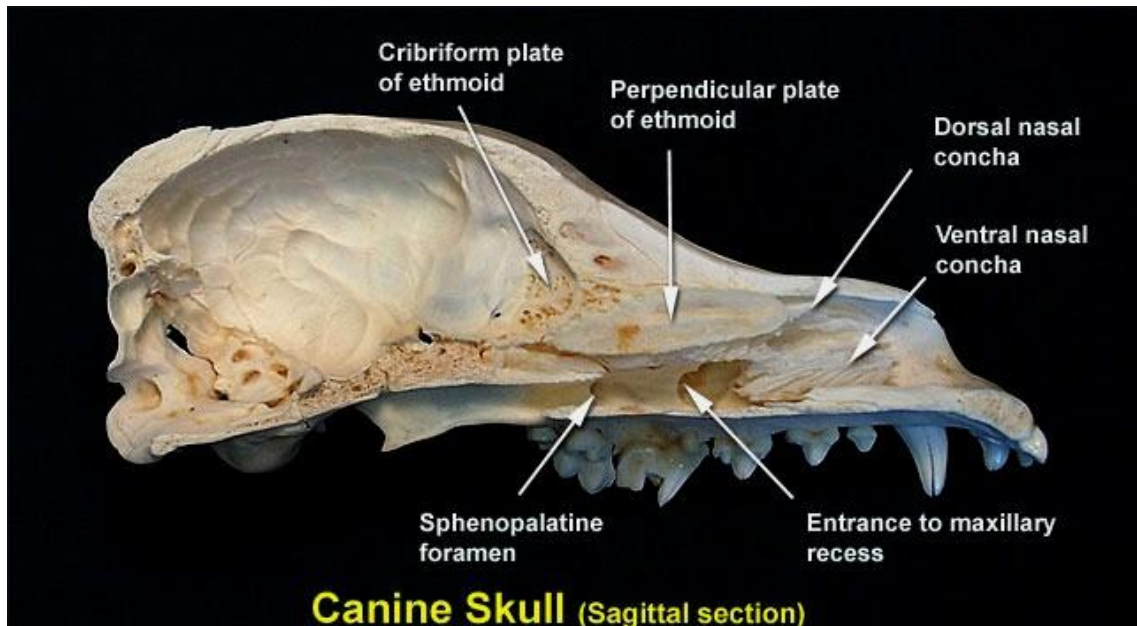
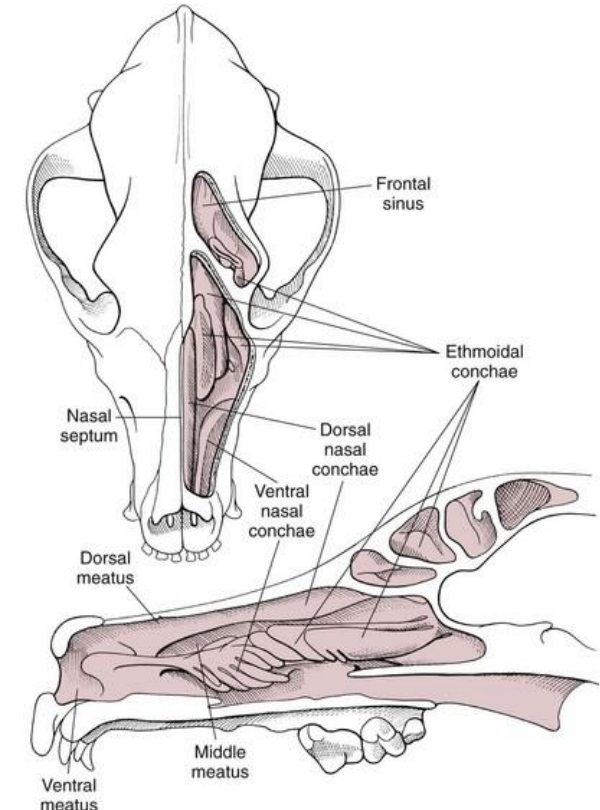
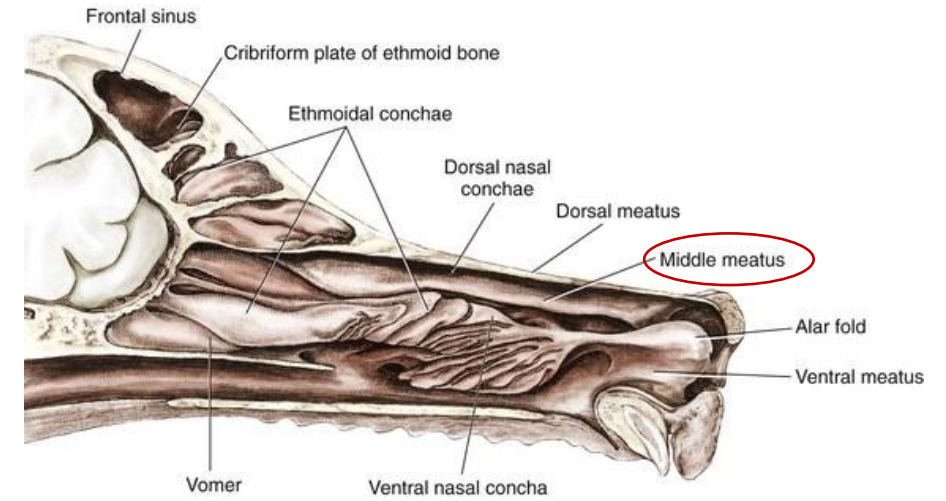


Fig. 1-30. Skull of a dog (medial aspect of sagittal section).

OBERE LUFTWEGE NASE (RHIN, NASUS)

MEATUS NASI MEDIUS (MEDIALER NASENGANG):

- liegt zwischen der dorsalen und ventralen Nasenmuschel
- endet im Nasengrund
- bei Flfr. und Wdk. – in einem dorsalen und ventralen Schenkel unterteilt
- mit den Nebenhöhlen angeschlossen ist – **Sinusgang** benannt

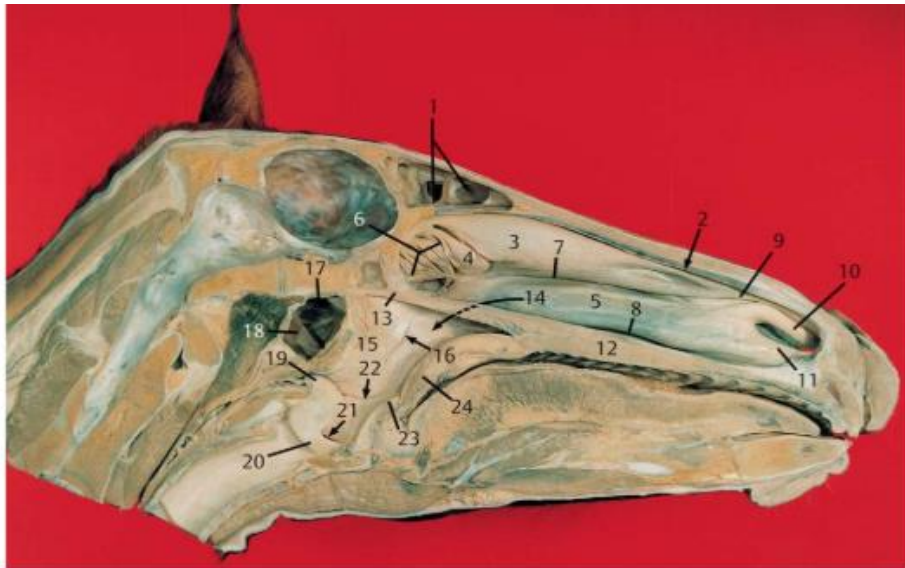
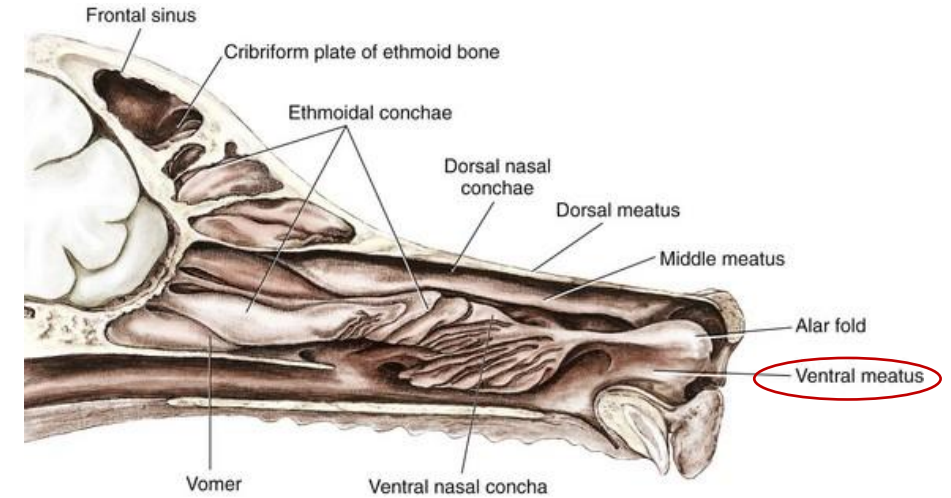


Canine Skull (Sagittal section)

OBERE LUFTWEGE NASE (RHIN, NASUS)

MEATUS NASI VENTRALIS (VENTRALER NASENGANG):

- liegt zwischen der ventralen Nasenmuschel und dem Nasenhöhlenboden
- geht caudal über den Meatus nasopharyngeus und die Choane in den Nasenrachen über
- es wird **Atmungsgang** benannt – durchstreicht die Hauptmasse der Atemluft



4.8 Medianschnitt durch den Kopf eines Pferdes

- | | | |
|--|--------------------------------------|----------------------------|
| 1 Sinus frontalis | 9 Plica recta | 18 Stylohyoideum |
| 2 Meatus nasi dorsalis | 10 Plica alaris | 19 Tuberculum corniculatum |
| 3 Concha nasalis dorsalis | 11 Plica basalis | 20 Plica vocalis |
| 4 Concha nasalis media | 12 harter Gaumen | 21 Ventriculus laryngis |
| 5 Concha nasalis ventralis | 13 Vomer | 22 Plica aryepiglottica |
| 6 Conchae ethmoidales mit Meatus ethmoidales | 14 Choane (Pfeil) | 23 Epiglottis |
| 7 Meatus nasi medius | 15 Pars nasalis pharyngis | 24 weicher Gaumen |
| 8 Meatus nasi ventralis | 16 Ostium pharyngeum tubae auditivae | |
| | 17 Luftsack | |

- E Ethmoid
F Frontal
I Incisive
M Maxilla
Mt Maxilloturbinate
N Nasal
O Occipital
Pl Palatine
Pt Pterygoid
S Sphenoid
- I Endoturbinat I
II Endoturbinat II
III Endoturbinat III
IV Endoturbinat IV

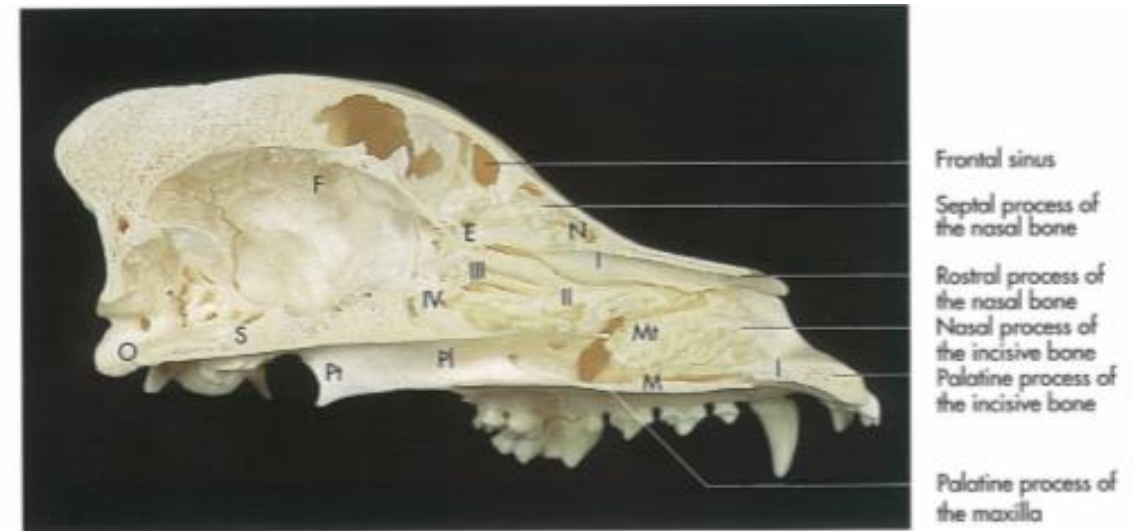


Fig. 1-30. Skull of a dog (medial aspect of sagittal section).

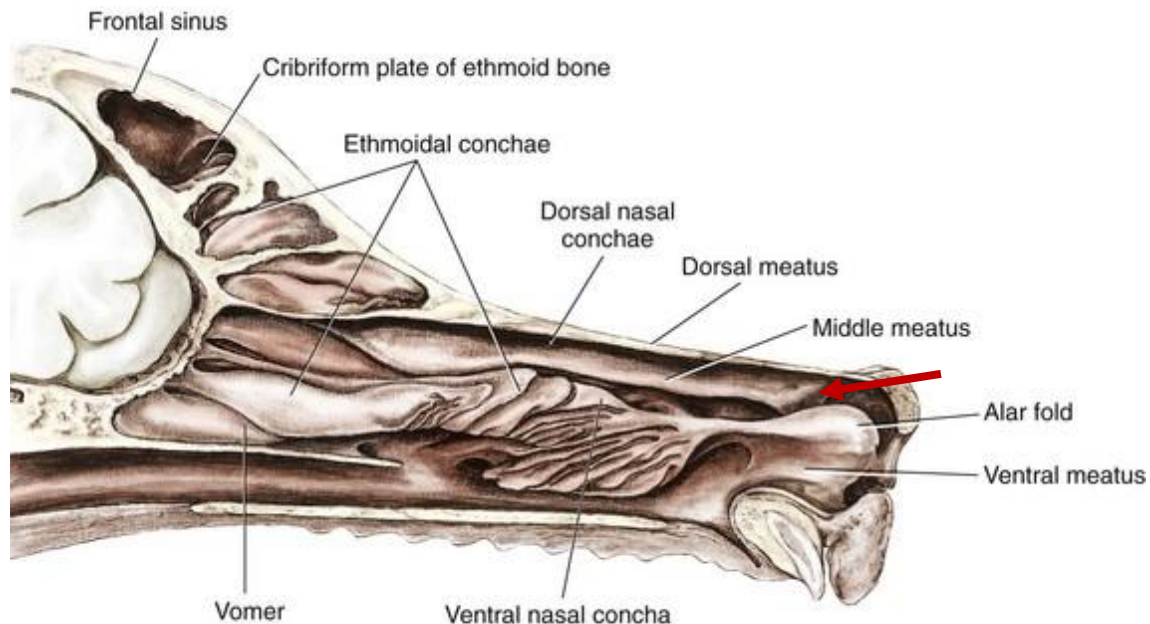
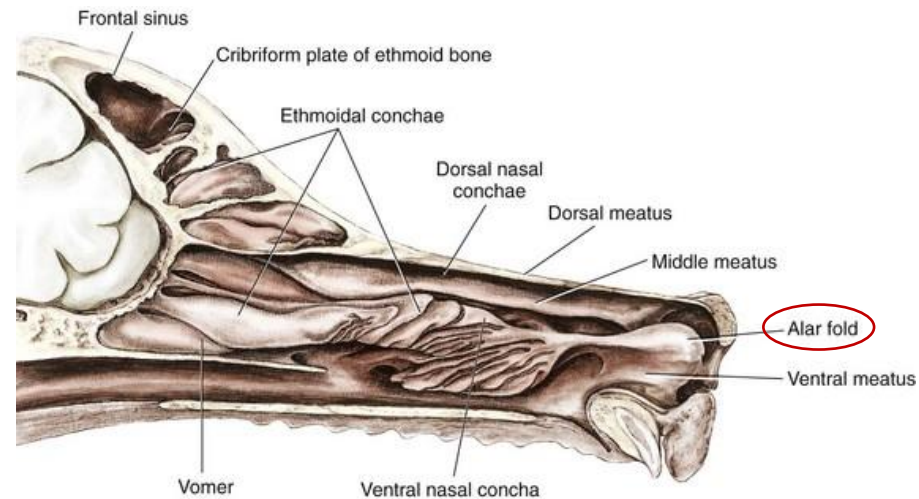
OBERE LUFTWEGE NASE (RHIN, NASUS)

SCHLEIMHAUT DER NASE:

- bildet rostral mit den Nasenmuskeln verbundene Falten

PLICA RECTA:

- an der dorsalen Muschel ist es die gerade Falte
- beim Pferd – an ihrem muschelwärtigen Ursprung in einem dorsalen und ventralen Schenkel unterteilt



4.8 Medianschnitt durch den Kopf eines Pferdes

- | | | |
|--|--------------------------------------|----------------------------|
| 1 Sinus frontalis | 9 Plica recta | 18 Stylohyoideum |
| 2 Meatus nasi dorsalis | 10 Plica alaris | 19 Tuberculum corniculatum |
| 3 Concha nasalis dorsalis | 11 Plica basalis | 20 Plica vocalis |
| 4 Concha nasalis media | 12 harter Gaumen | 21 Ventriculus laryngis |
| 5 Concha nasalis ventralis | 13 Vomere | 22 Plica aryepiglottica |
| 6 Conchae ethmoidales mit Meatus ethmoidales | 14 Choane (Pfeil) | 23 Epiglottis |
| 7 Meatus nasi medius | 15 Pars nasalis pharyngis | 24 weicher Gaumen |
| 8 Meatus nasi ventralis | 16 Ostium pharyngeum tubae auditivae | |
| | 17 Luftsack | |

OBERE LUFTWEGE NASE (RHIN, NASUS)

SCHLEIMHAUT DER NASE:

PLICA ALARIS:

- an der ventralen Muschel bestehen dorsal die Flügelfalte

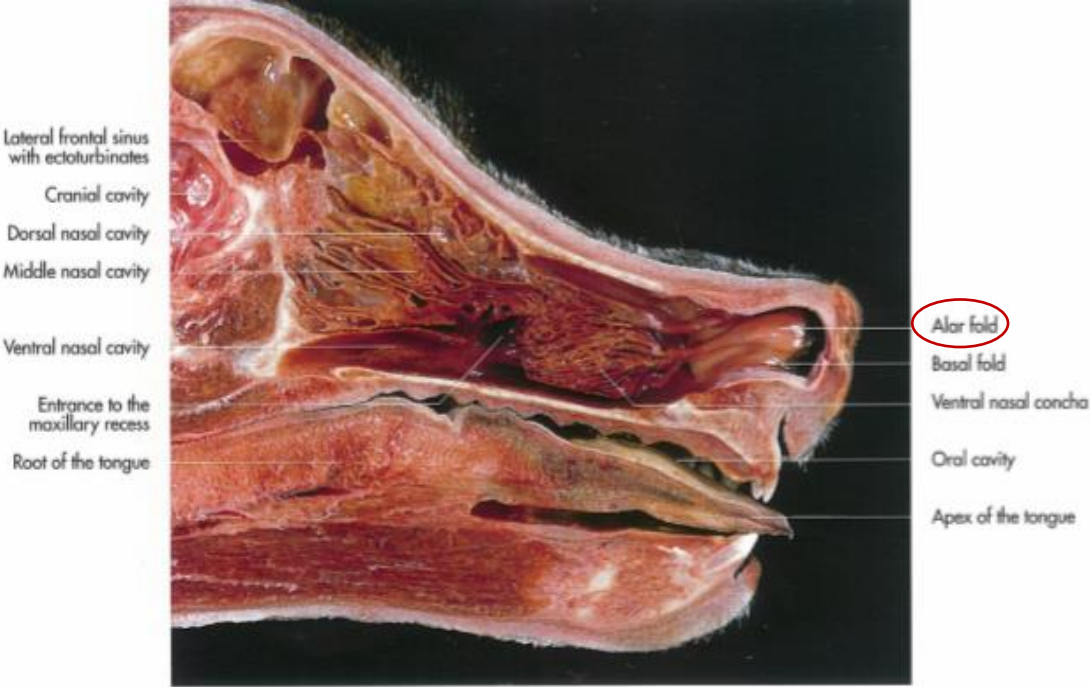
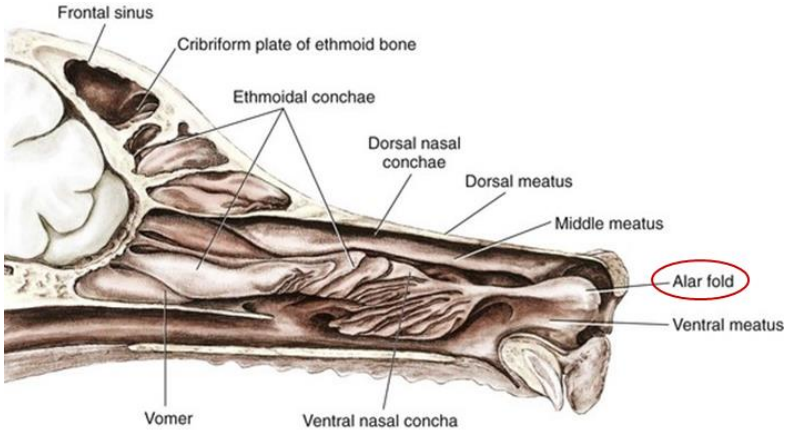
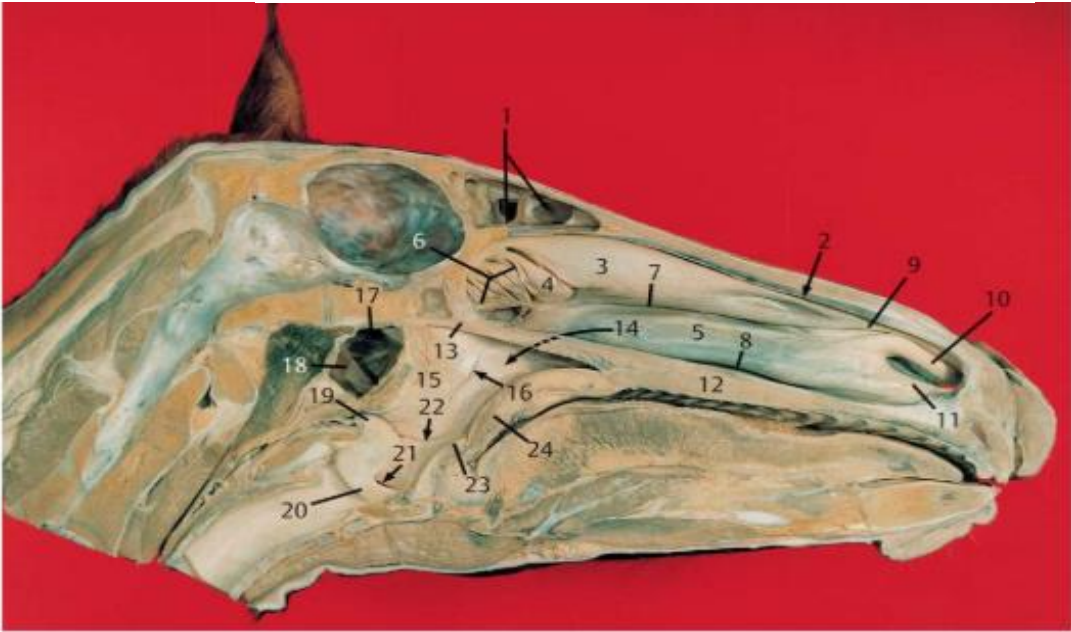


Fig. 8-10. Paramedian section of the head of a dog, medial aspect (courtesy of PD Dr. J. Maierl, Munich).



- 4.8 Medianschnitt durch den Kopf eines Pferdes
- | | | |
|--|--------------------------------------|----------------------------|
| 1 Sinus frontalis | 9 Plica raris | 18 Stylohyoideum |
| 2 Meatus nasi dorsalis | 10 Plica alaris (circled in red) | 19 Tuberculum corniculatum |
| 3 Concha nasalis dorsalis | 11 Plica basalis | 20 Plica vocalis |
| 4 Concha nasalis media | 12 harter Gaumen | 21 Ventriculus laryngis |
| 5 Concha nasalis ventralis | 13 Vomer | 22 Plica aryepiglottica |
| 6 Conchae ethmoidales mit Meatus ethmoidales | 14 Choane (Pfeil) | 23 Epiglottis |
| 7 Meatus nasi medius | 15 Pars nasalis pharyngis | 24 weicher Gaumen |
| 8 Meatus nasi ventralis | 16 Ostium pharyngeum tubae auditivae | |
| | 17 Luftsack | |

OBERE LUFTWEGE NASE (RHIN, NASUS)

SCHLEIMHAUT DER NASE:

PLICA BASALIS:

- Bodenfalte
- beim Pferd zieht von der ventralen Muschel rostral
- bei Flfr. – Schw.- Wdk. – ventral von der Concha nasalis ventralis gelegen
 - rostral mit der Flügelfalte verbindet



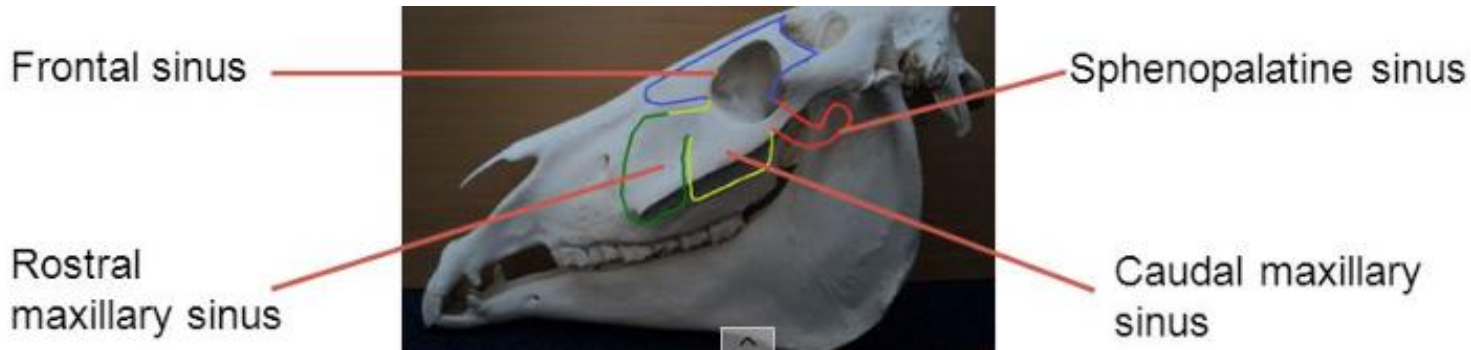
4.8 Medianschnitt durch den Kopf eines Pferdes

- | | | |
|--|--------------------------------------|----------------------------|
| 1 Sinus frontalis | 9 Plica recta | 18 Stylohyoideum |
| 2 Meatus nasi dorsalis | 10 Plica alaris | 19 Tuberculum corniculatum |
| 3 Concha nasalis dorsalis | 11 Plica basalis | 20 Plica vocalis |
| 4 Concha nasalis media | 12 harter Gaumen | 21 Ventriculus laryngis |
| 5 Concha nasalis ventralis | 13 Vomer | 22 Plica aryepiglottica |
| 6 Conchae ethmoidales mit Meatus ethmoidales | 14 Choane (Pfeil) | 23 Epiglottis |
| 7 Meatus nasi medius | 15 Pars nasalis pharyngis | 24 weicher Gaumen |
| 8 Meatus nasi ventralis | 16 Ostium pharyngeum tubae auditivae | |
| | 17 Luftsack | |

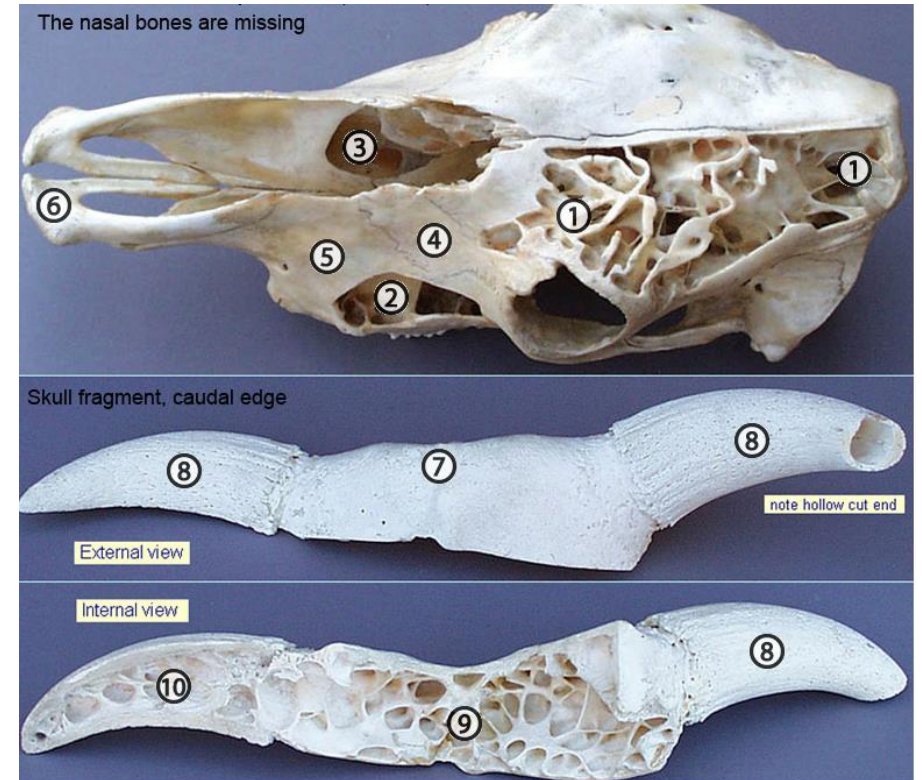
Fig. 8-10. Paramedian section of the head of a dog, medial aspect (courtesy of PD Dr. J. Maierl, Munich).

NASENHÖHLEN (SINUS PARANASALES)

- stellen schleimhautausgekleidete, Luftfüllte Höhlen
- beim Jungtier wenig entwickelt
- vergrößern sich mit dem zunehmendem Alter
- reduzieren das spezifische Gewicht des Schädels
- vergrößern die Schädeloberfläche für die Muskelansätze
- dienen als Isolation von Augen, - Nasen, - Schädelhöhle
- *die Pneumatizierung der Schädelknochen besonders beim Rind und Schwein auffällig*



<https://slideplayer.com/slide/3862879/>

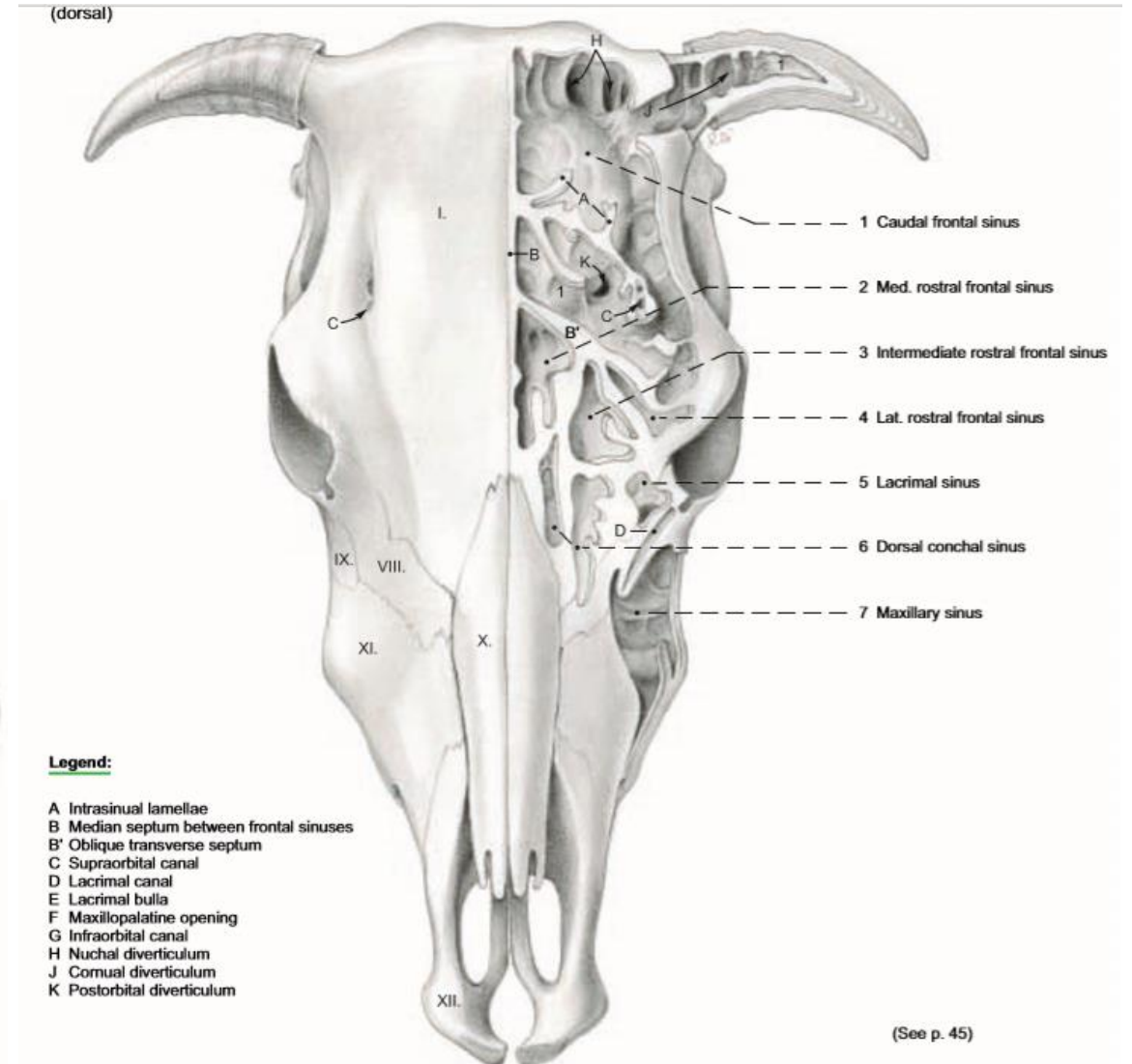
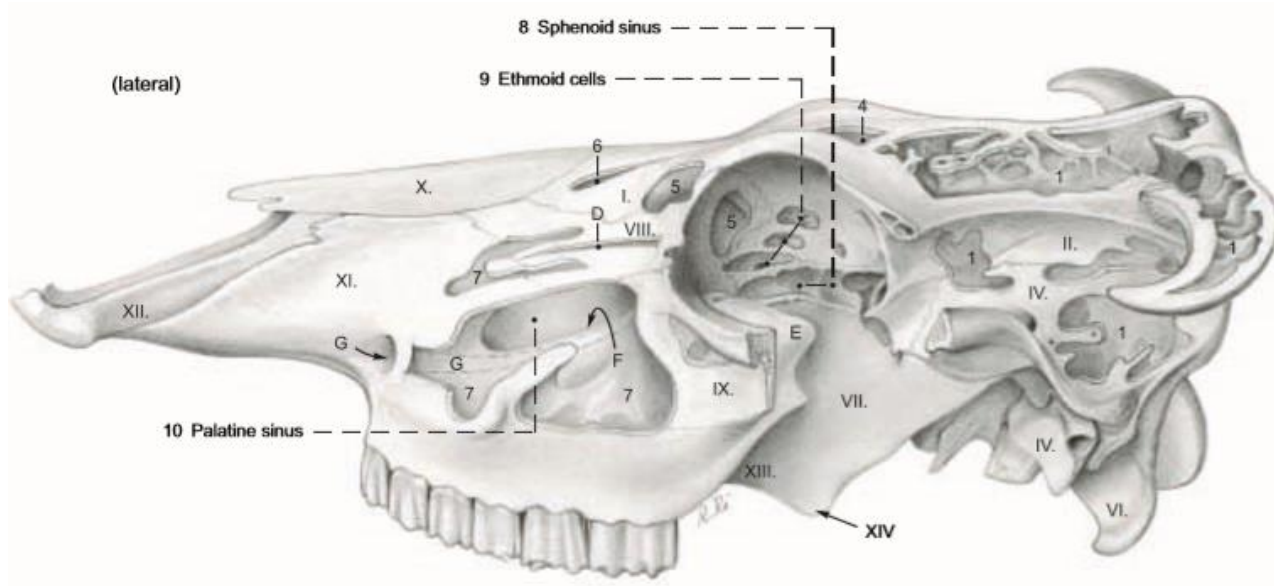


Bovine skull, dorsal views. 1, extensive frontal sinus; 2, maxillary sinus; 3, palatine sinus; 4, lacrimal bone; 5, maxilla; 6, incisive bone; 7, dorsal surface of skull; 8, cornual process; 9, frontal sinus; 10, extension of the frontal sinus into the cornual process.

<http://vanat.cvm.umn.edu/ungDissect/Lab18/lmg18-9.html>

NASENHÖHLEN (SINUS PARANASALES)

1. SINUS MAXILLARIS (KIEFERHÖHLE)
2. SINUS FRONTALIS (STIRNHÖHLE)
3. SINUS PALATINUS (GAUMENHÖHLE)
4. SINUS SPHENOIDALIS (KEILBEINHÖHLE)
5. SINUS LACRIMALIS (TRÄNENBEINHÖHLE)
6. **CELLULAE ETHMOIDALES (SIEBBEINZELLEN) – bei Schw. und Wdk**



NASENHÖHLEN (SINUS PARANASALES)

SINUS MAXILLARIS (KIEFERHÖHLE):

- höhlt den Kaudalteil der Maxilla aus

beim Pferd

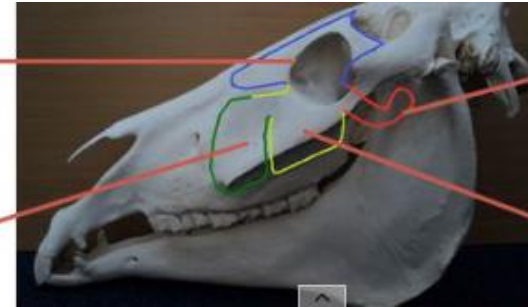
- durch Septum sinuum maxillarium in einem Sinus maxillaris rostralis et caudalis unterteilt
- Sinus maxillaris rostralis et caudalis mit dem mittleren Nasengang über die Apertura nasomaxillaris verbunden
- vom Canalis infraorbitalis durchzogen wird – so in eine laterale und eine mediale Bucht unterteilt

Frontal sinus

Sphenopalatine sinus

Rostral maxillary sinus

Caudal maxillary sinus



F Frontal
I Incisive
L Lacrimal
M Maxilla
N Nasal
Pl Palatine
Pt Pterygoid
Z Zygomatic

Infraorbital foramen

Interalveolar margin

Lateral alveolar border of the maxilla



Supraorbital foramen

Frontal sinus

Rostral maxillary sinus

Caudal maxillary sinus

Pterygoid process of the basisphenoid bone

Facial crest

F Frontal
L Lacrimal
M Maxilla
N Nasal
Z Zygomatic

Inner table of the frontal bone

Frontal sinus

Infraorbital foramen



Zygomatic process of the frontal bone

Supraorbital foramen

Rostral lacrimal process

Caudal maxillary sinus

Rostral maxillary sinus

Fig. 1-64. Frontal and maxillary sinuses of a horse (lateral aspect).

Fig. 1-65. Frontal and maxillary sinuses of a horse (dorsal aspect).

NASENHÖHLEN (SINUS PARANASALES)

SINUS MAXILLARIS (KIEFERHÖHLE):

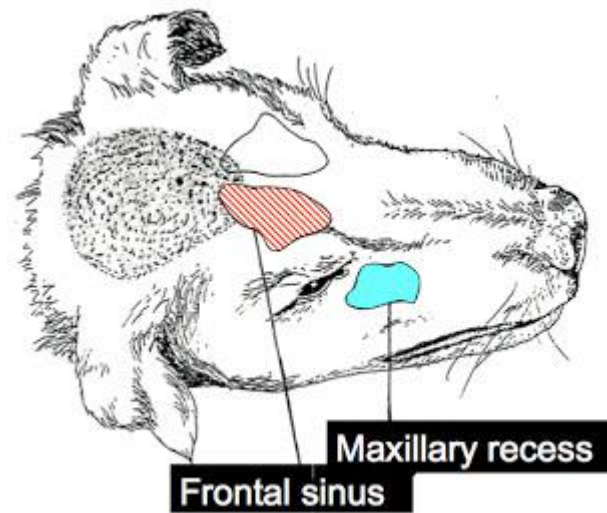
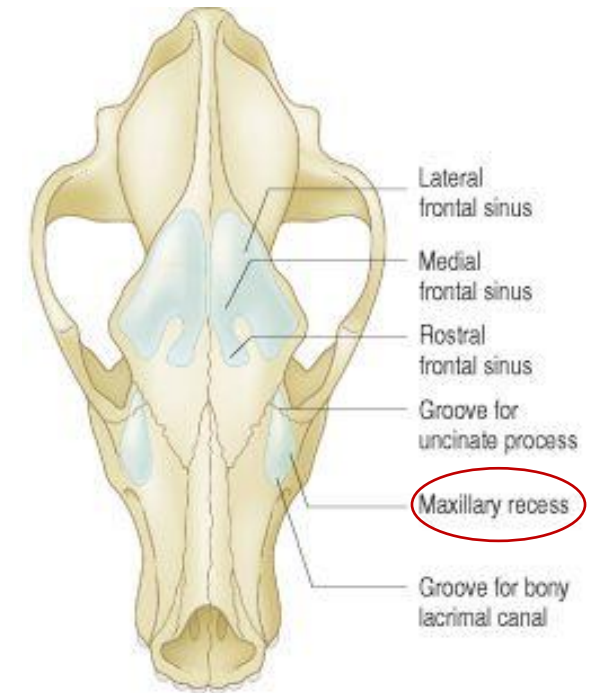
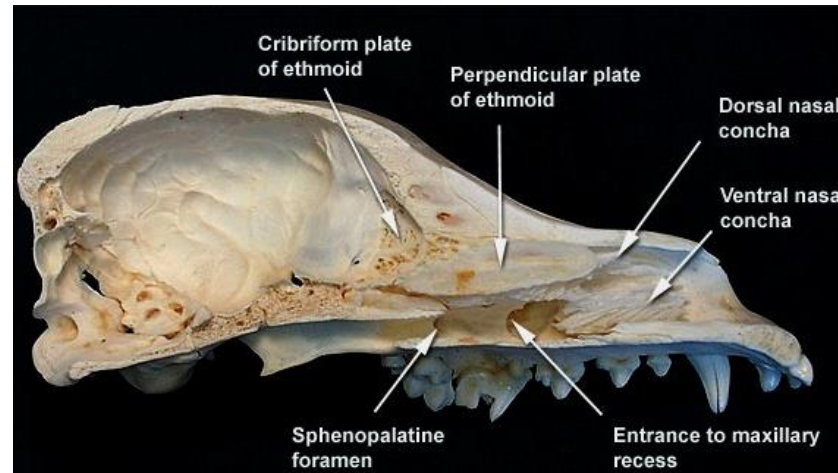
- höhlt den Kaudalteil der Maxilla aus

bei der Katze, beim Hund

- keine Kieferhöhle ausgebildet
- NUR eine flache Kieferbucht (Recessus maxillaris)

RECESSUS MAXILLARIS:

- liegt die laterale Nasendrüse (Gl. nasalis lateralis)
- Befeuchtung der Nasenspitze



NASENHÖHLEN (SINUS PARANASALES)

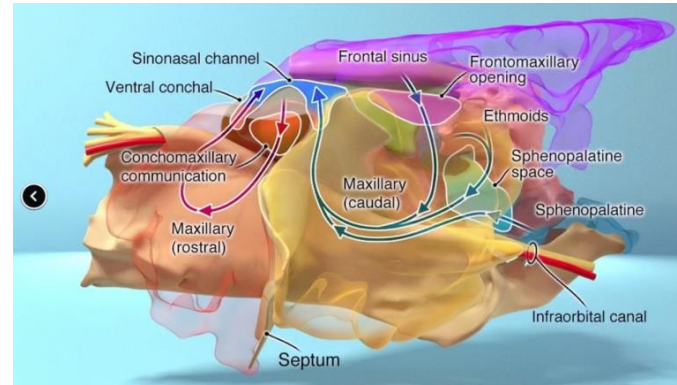
SINUS FRONTALIS (STIRNHÖHLE):

- öffnet sich in den mittleren Nasengang

beim Pferd

- kommuniziert mit der Höhle der oberen Nasenmuschel (Sinus conchofrontalis)

- steht mit der kaudalen Kieferhöhle in Verbindung – Aditus frontomaxillaris



<https://vimeo.com/254730765>

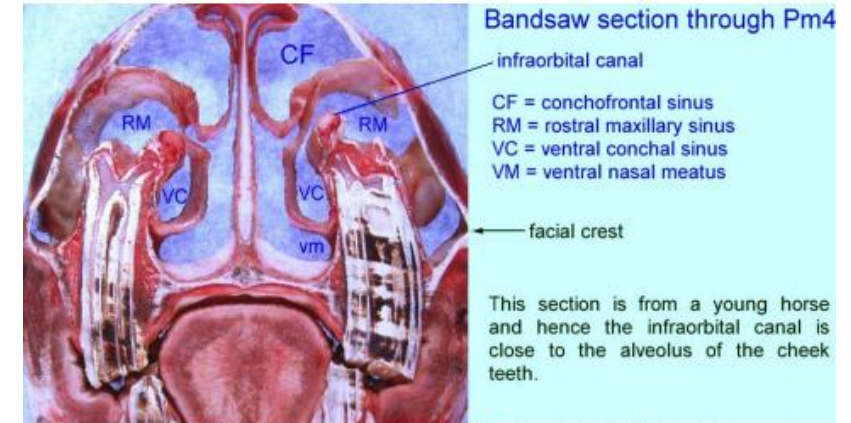


Figure 3. Bandsaw section through the rostral maxillary sinus.

<http://www.equinedental.eu/uploads/documents/FOCUSonDENTISTRYPROCEEDINGS.pdf>

F Frontal
I Incisive
L Lacrimal
M Maxilla
N Nasal
Pl Palatine
Pt Pterygoid
Z Zygomatic



Fig. 1-64. Frontal and maxillary sinuses of a horse (lateral aspect).

F Frontal
L Lacrimal
M Maxilla
N Nasal
Z Zygomatic

Inner table of the frontal bone
Frontal sinus (circled in red)

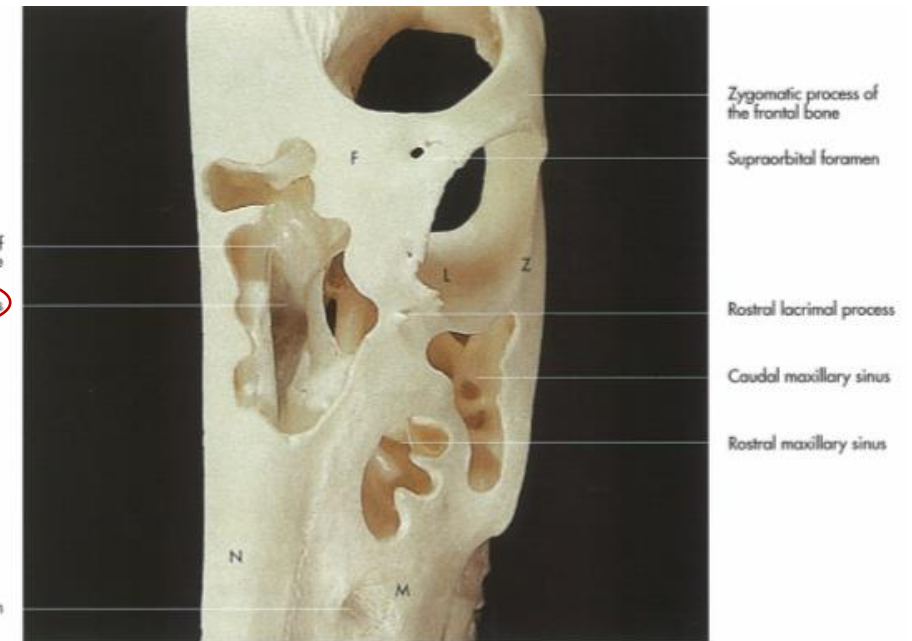


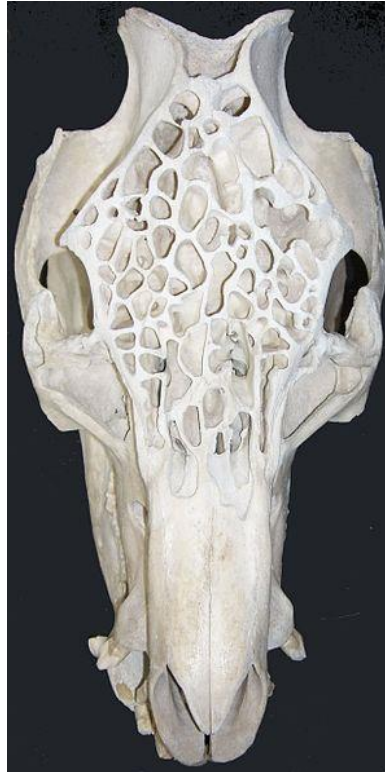
Fig. 1-65. Frontal and maxillary sinuses of a horse (dorsal aspect).

NASENHÖHLEN (SINUS PARANASALES)

SINUS FRONTALIS (STIRNHÖHLE):

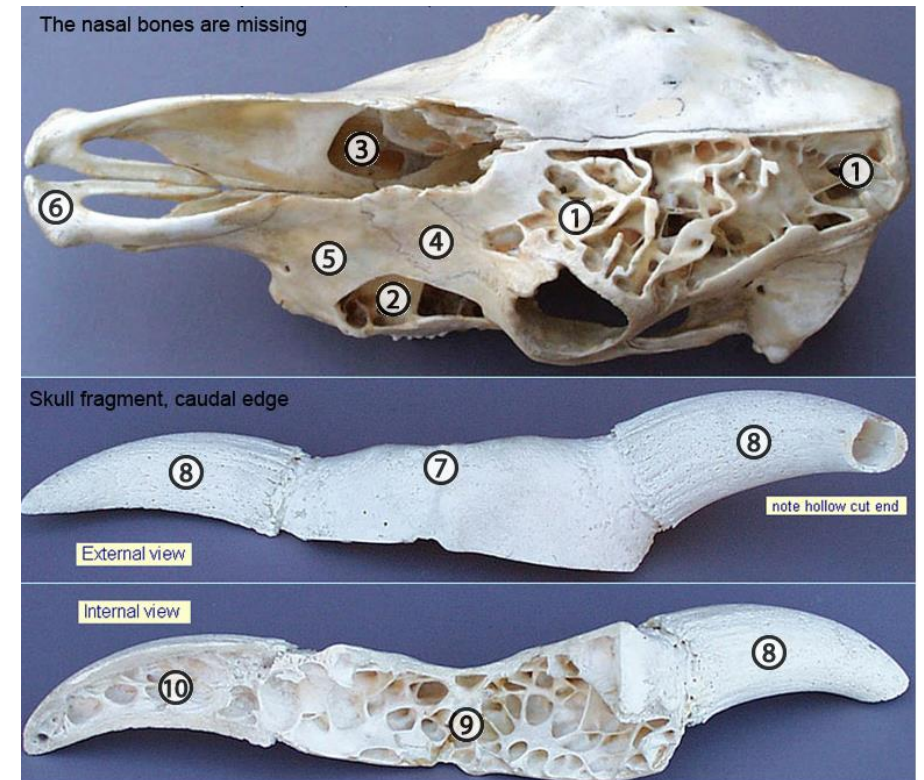
beim Schwein und Rind

- stark unterteilt
- dehnt bis in die Genickgegend aus
- beim Wdk. – erstreckt sich bis in den Proc. cornualis des Os frontale



Sinus frontalis pig

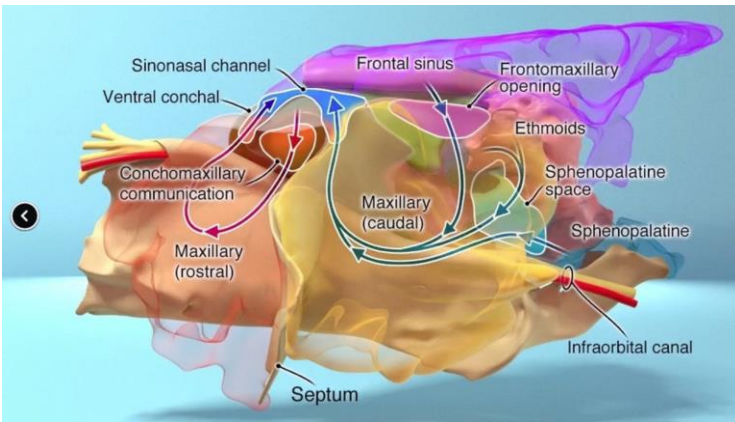
https://commons.wikimedia.org/wiki/File:Sinus_frontalis_pig.jpg



Bovine skull, dorsal views. 1, extensive frontal sinus; 2, maxillary sinus; 3, palatine sinus; 4, lacrimal bone; 5, maxilla; 6, incisive bone; 7, dorsal surface of skull; 8, cornual process; 9, frontal sinus; 10, extension of the frontal sinus into the cornual process.

<http://vanat.cvm.umn.edu/ungDissect/Lab18/img18-9.html>

NASENHÖHLEN (SINUS PARANASALES)



SINUS SPHENOPALATINUS:

- beim Pferd
- das Gaumenbein und das Keilbein werden vom Sinus sphenopalatinus pneumatiziert
- Sinus sphenopalatinus kommuniziert mit dem Sinus maxillaris caudalis

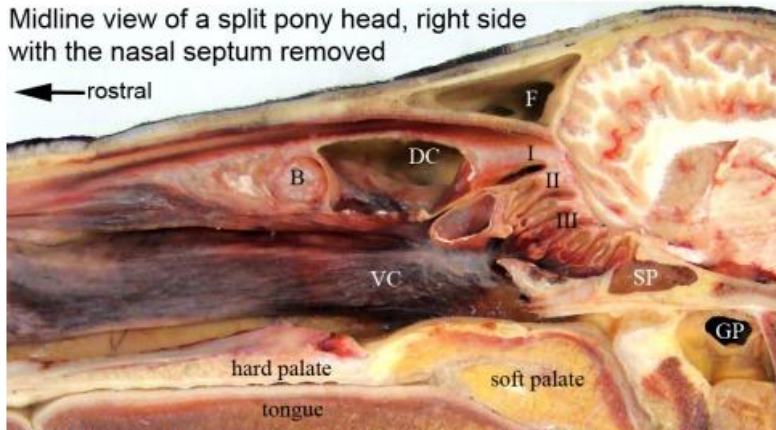
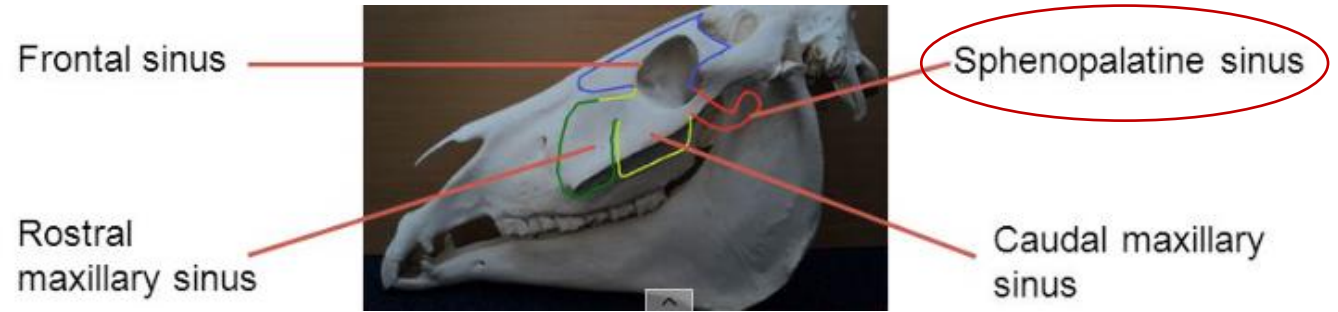


Figure 2. Split head of pony with windows cut into the dorsal concha and ethmoconcha II. I = ethmoconcha I (dorsal concha), II = ethmoconcha II (middle concha), III = ethmoconcha III, B = bulla in dorsal concha, DC = dorsal conchal sinus, F = frontal sinus, GP = guttural pouch, SP = sphenopalatine sinus, VC = ventral concha.

<http://www.equinedental.eu/uploads/documents/FOCUSonDENTISTRYPROCEEDINGS.pdf>

E Ethmoid
F Frontal
I Incisive
M Maxilla
Mt Maxilloturbinat
N Nasal
Pl Palatine

I Endoturbinat I
II Endoturbinat II
III Endoturbinat III

Rostral process of the nasal bone
Nasoincisive notch

Nasal process of the incisive bone
Palatine process of the incisive bone

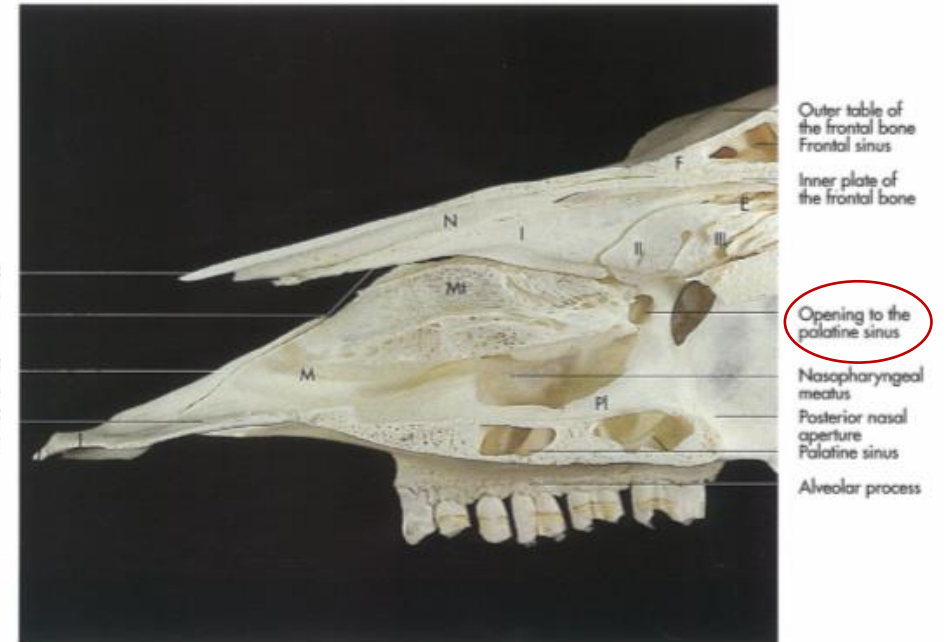
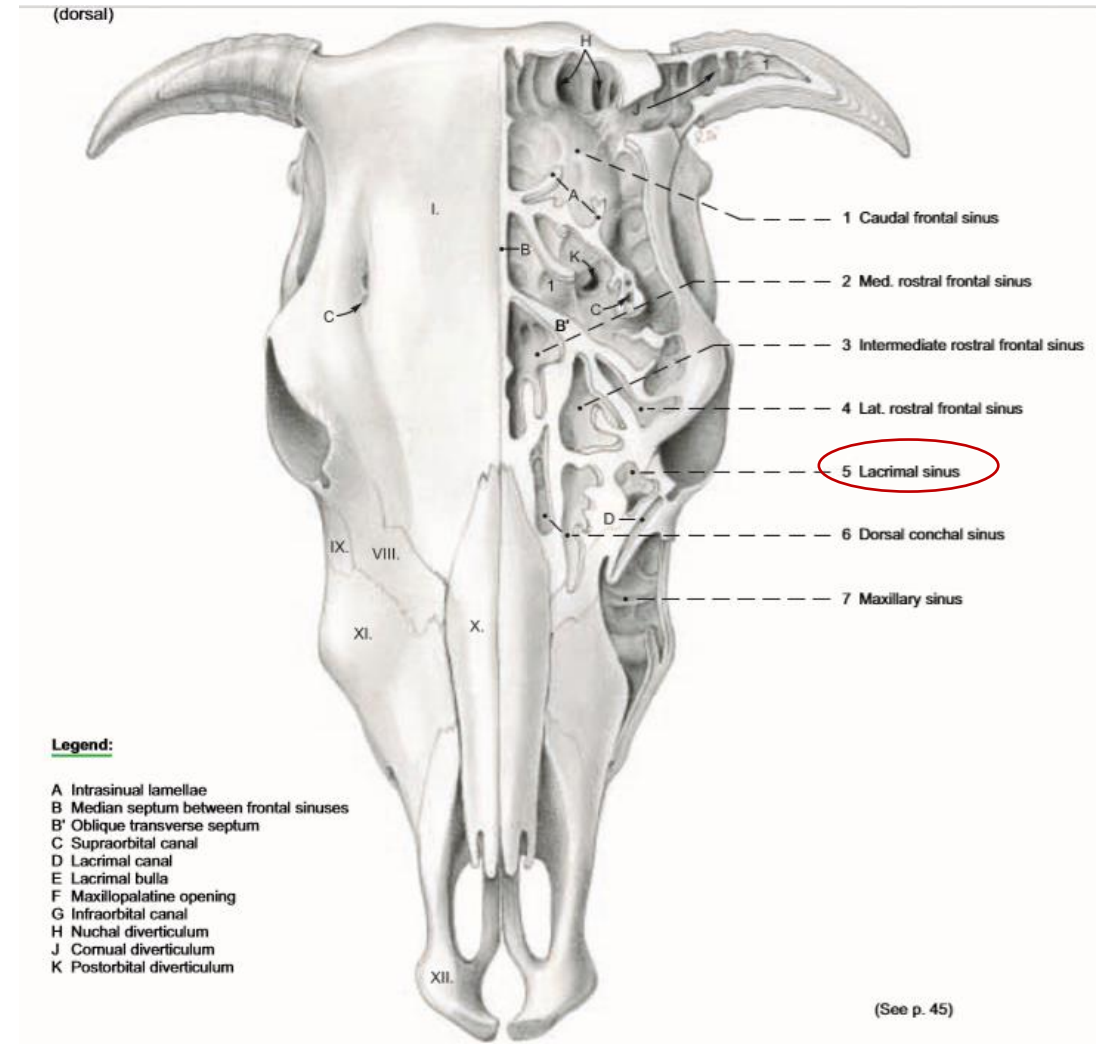


Fig. 1-32. Bones of the facial part of an equine skull (medial aspect of sagittal section).

NASENHÖHLEN (SINUS PARANASALES)

SINUS LACRIMALIS (TRÄNENBEINHÖHLE):

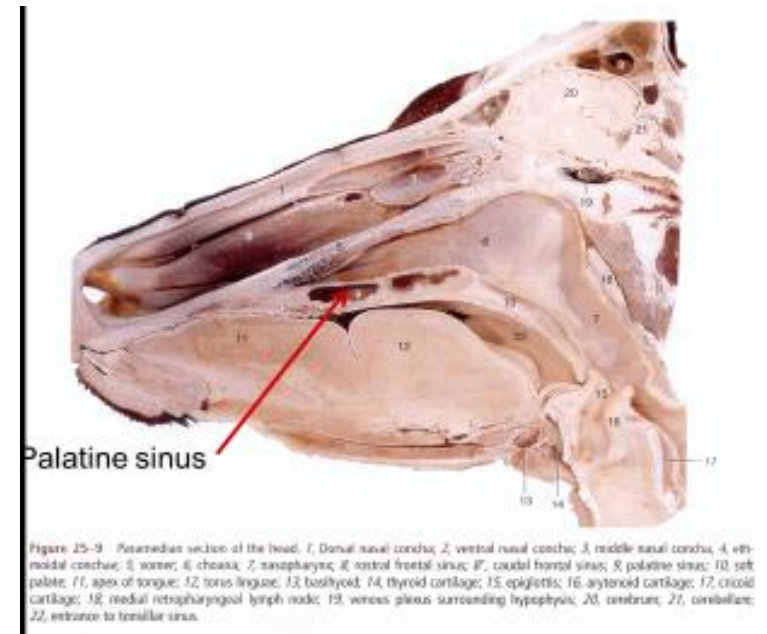
- gibt es nur beim Schwein und beim Wdk
- pneumatiziert das Os lacrimale
- beim Schw. – als selbständige Höhle den Siebbeingängen angeschlossen
- beim Wdk. – mit der Kieferhöhle verbunden



NASENHÖHLEN (SINUS PARANASALES)

SINUS PALATINUS (GAUMENHÖHLE):

- fehlt den Flfr. und beim Schw.
- bei den Wdk. – pneumatiziert die Lamina horizontalis palatini und den Proc. palatinus maxillae
- über Canalis infraorbitalis sind Gaumen – und Kieferhöhle durch Apertura maxillopalatina verbunden
- beim Pferd – erfüllt die Gaumenhöhle die Pars perpendicularis palatini



<https://www.studyblue.com/notes/note/n/paranasal-sinuses/deck/2449519>

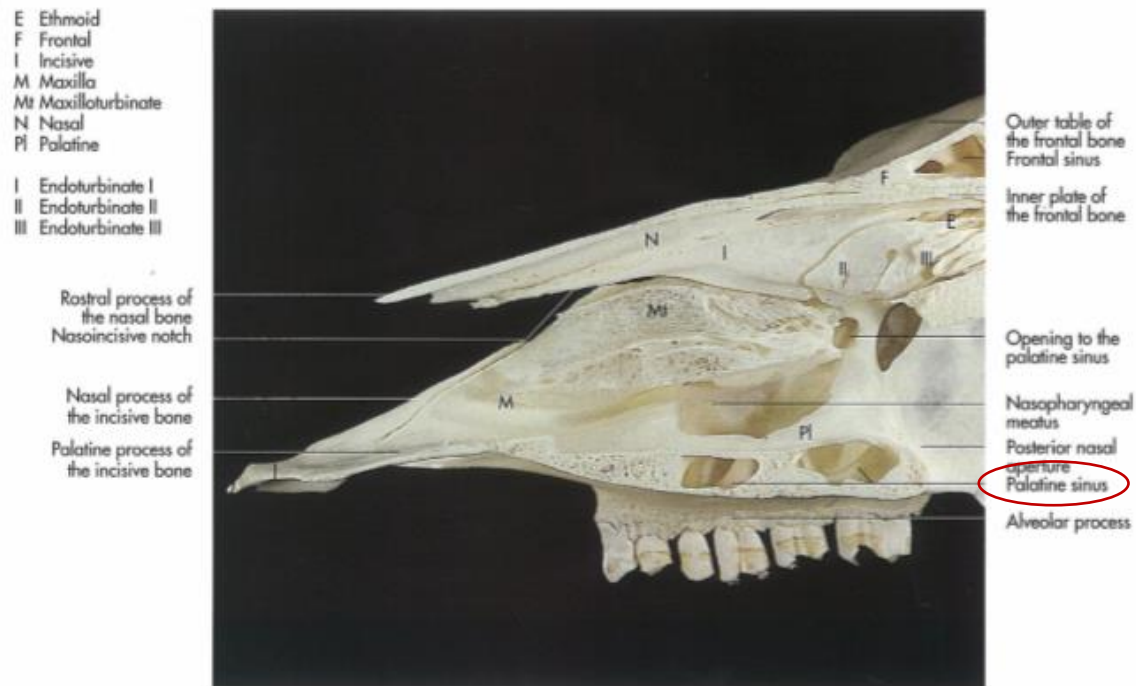
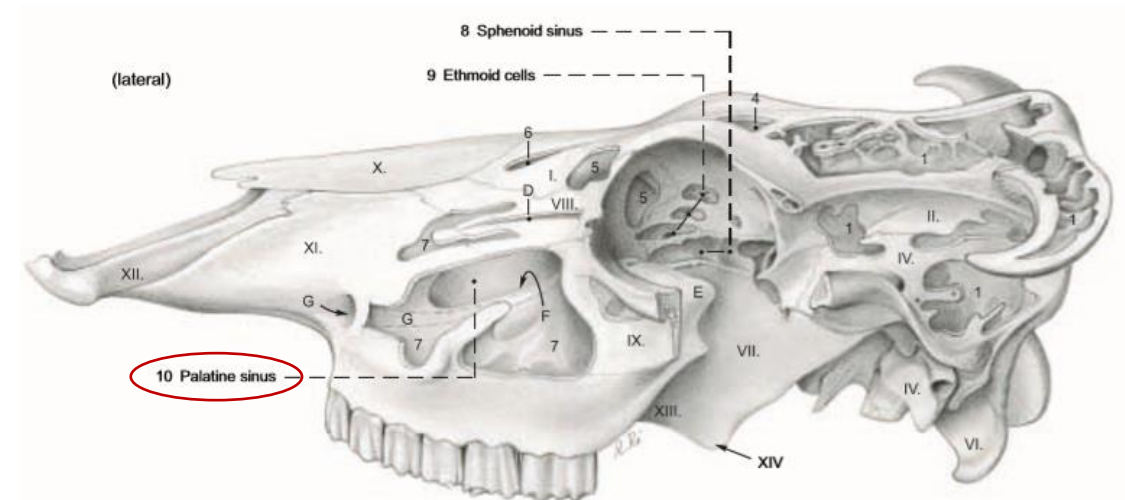


Fig. 1-32. Bones of the facial part of an equine skull (medial aspect of sagittal section).



NASENHÖHLEN (SINUS PARANASALES)

SINUS SPHENOIDALIS (KEILBEINHÖHLE):

- durch Septum in die linke und rechte Höhle unterteilt
- **bei Hund, kleine Wdk. – fehlt**
- beim Schw. – den Siebbeingängen abgeschlossen
- beim Pferd – die Gaumenhöhle angeschlossen – Sinus sphenopalatinus

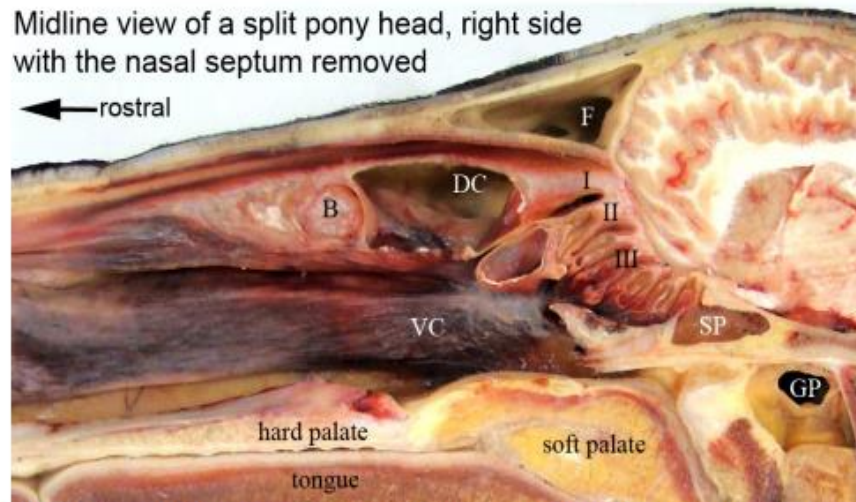
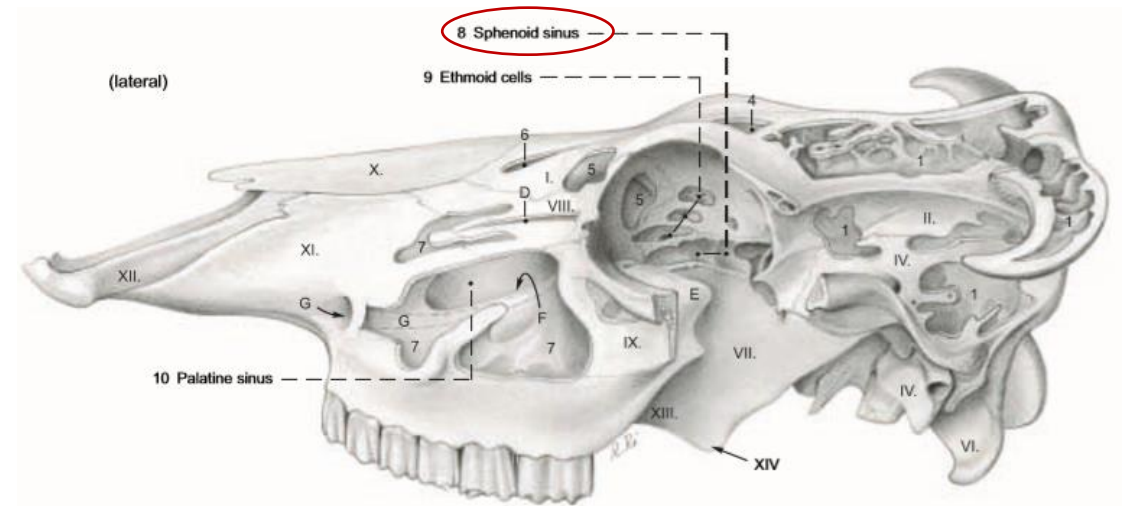


Figure 2. Split head of pony with windows cut into the dorsal concha and ethmoconcha II. I = ethmoconcha I (dorsal concha), II = ethmoconcha II (middle concha), III = ethmoconcha III, B = bulla in dorsal concha, DC = dorsal conchal sinus, F = frontal sinus, GP = guttural pouch, SP = sphenopalatine sinus, VC = ventral concha.

<http://www.equinedental.eu/uploads/documents/FOCUSonDENTISTRYPROCEEDINGS.pdf>

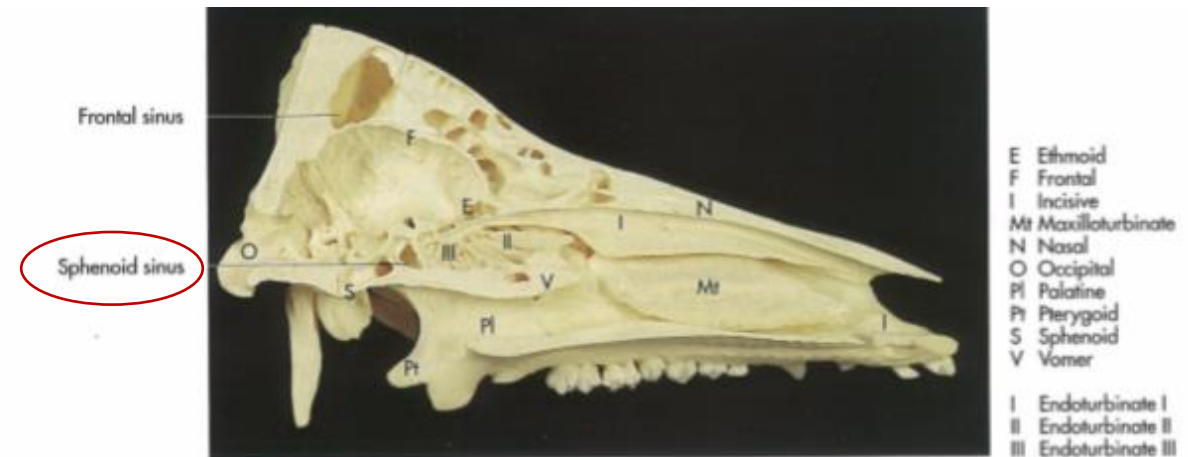


Fig. 1-31. Skull of a pig (medial aspect of sagittal section).

UNTERE LUFTWEGE KEHLKOPF (LARYNX)

- ein röhrenförmig, bilateralassymetrisch angelegtes Hohlorgan
- den Rachen mit der Luftröhre verbindet

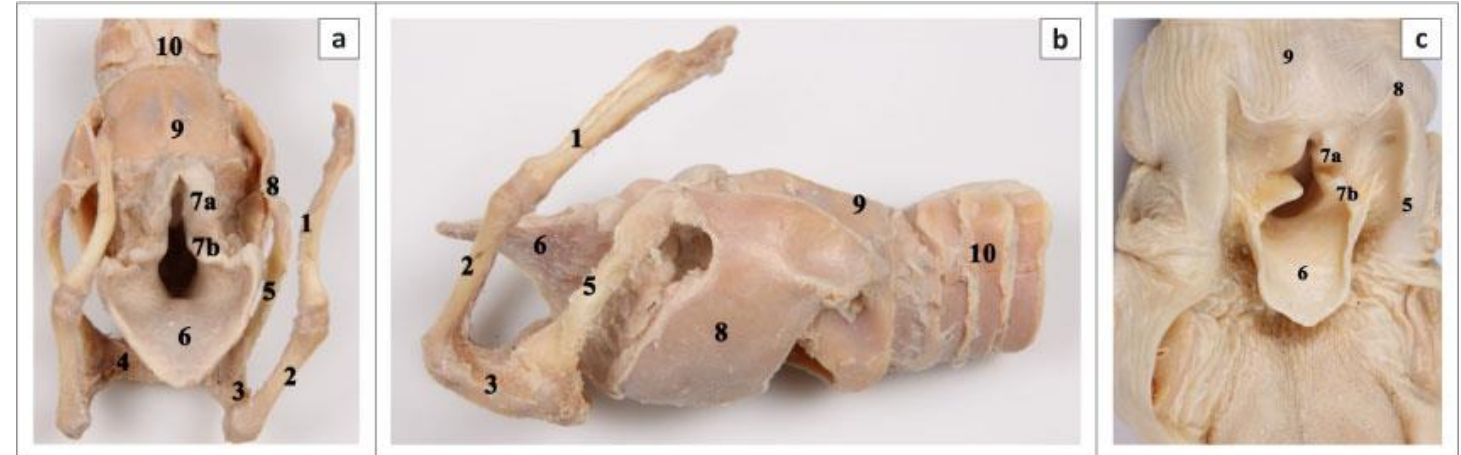
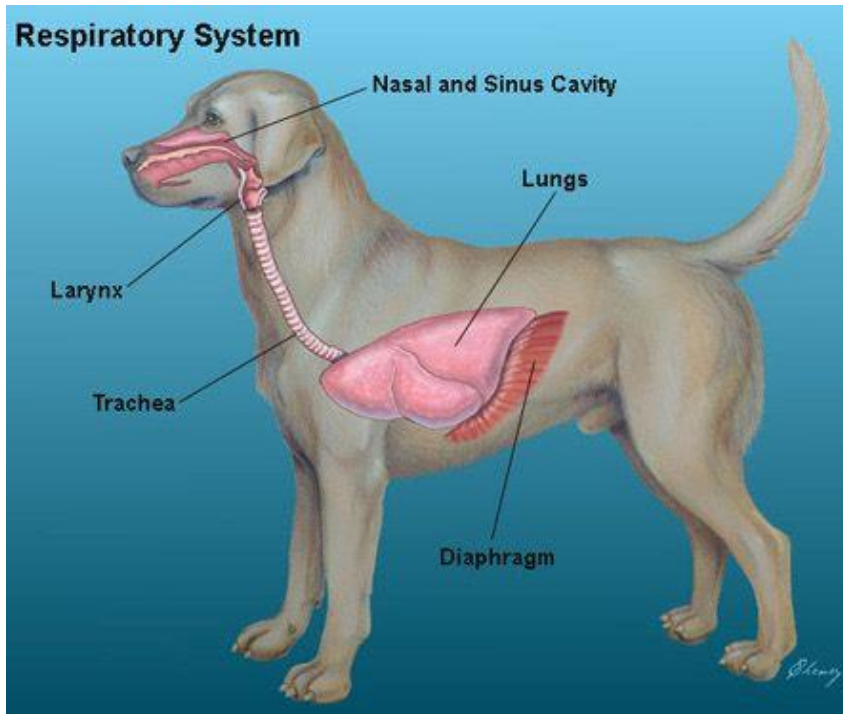
External acoustic meatus
Styloid process
Typanohyoid

Arytenoid cartilage

Stylohyoid
Cricoid cartilage
Thyroid cartilage



Fig. 8-13. Skull of a horse with hyoid bone and larynx.



Source: Photographs by M. Doom

Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostradorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostradorsal view with the dorsal aspect of the oesophagus removed.

UNTERE LUFTWEGE

KEHLKOPF (LARYNX)

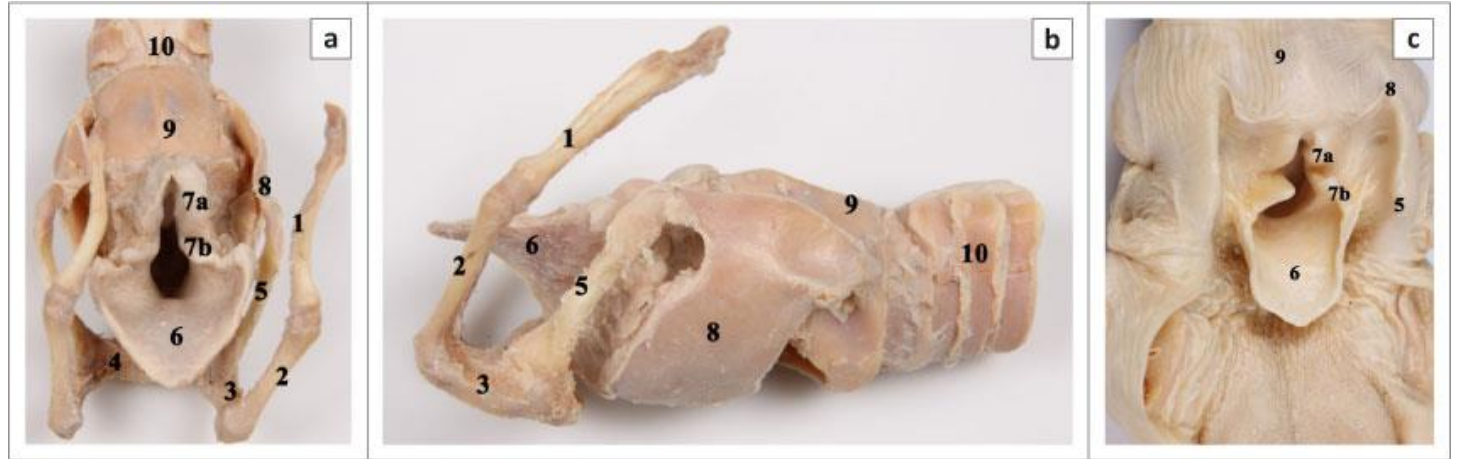
WAND DES KEHLKOPFS:

1. KEHLKOPFKNORPEL

2. BÄNDER

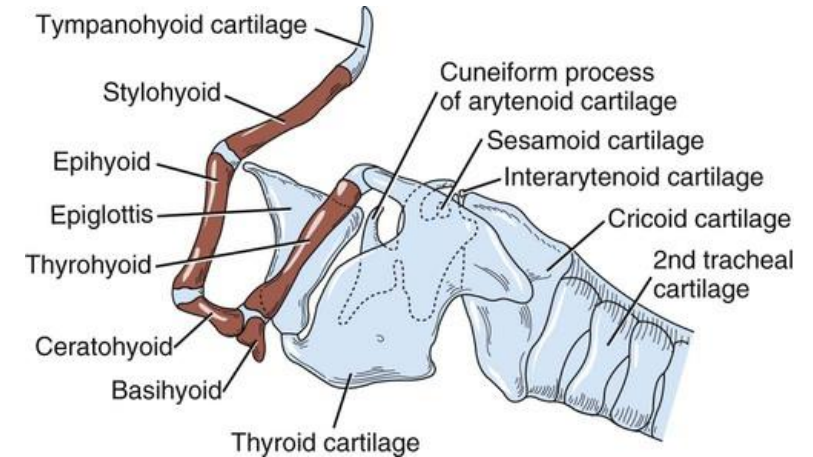
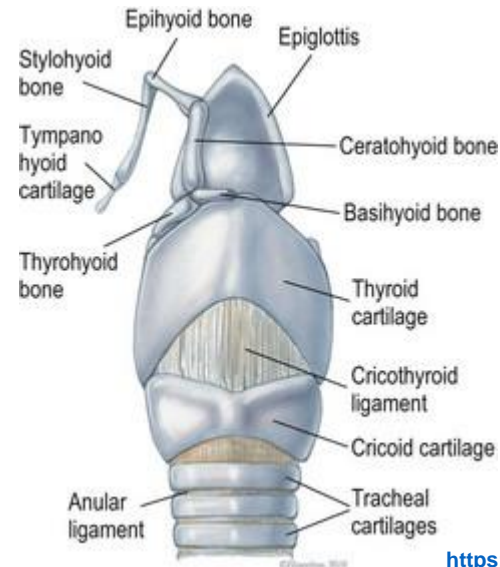
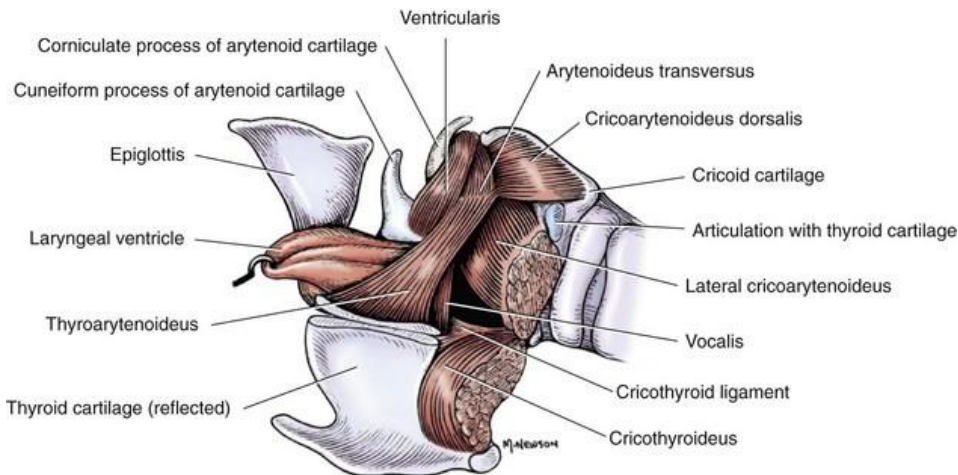
3. MUSKEL

- rostral mit den Knorpels des Zungenbeins
- kaudal mit der Luftröhre in Verbindung steht



Source: Photographs by M. Doom
Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostradorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostradorsal view with the dorsal aspect of the oesophagus removed.



UNTERE LUFTWEGE

KEHLKOPF (LARYNX)

KEHLKOPFSHÖHLE (CAVUM LARYNGIS):

- das Innere des Kehlkopfs
- durch Stimmfalten (Plicae vocales) sanduhrförmig eingengt
- seine pharynxseitige Öffnung wird beim Schluckakt durch die Verlagerung des Kehldeckels unvollständig verschlossen
- kaudal schließt sich ohne erkennbare Verengung die Knorplespangen der Trachea an

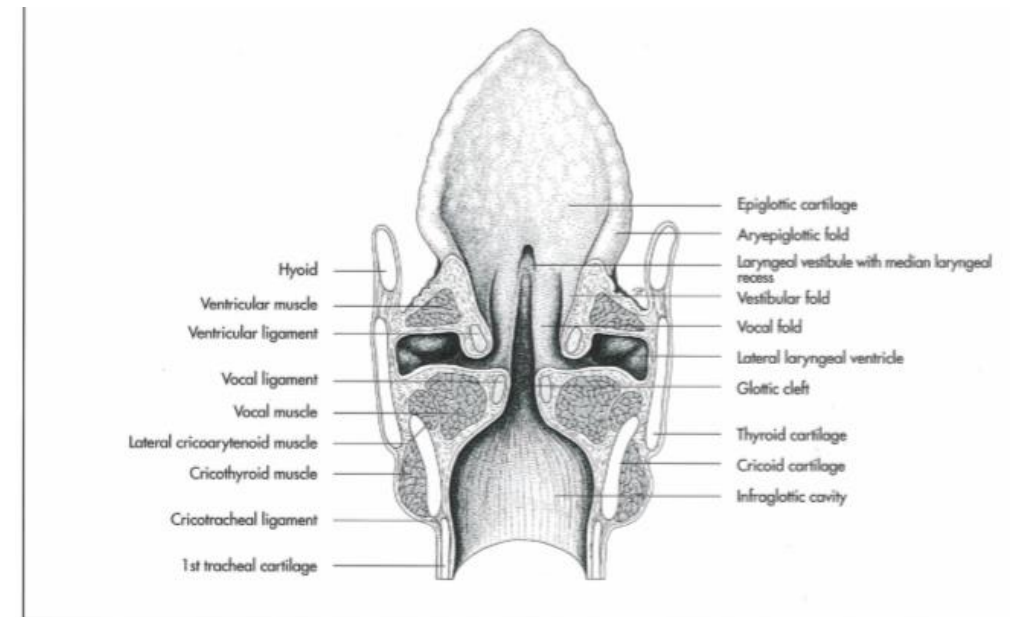
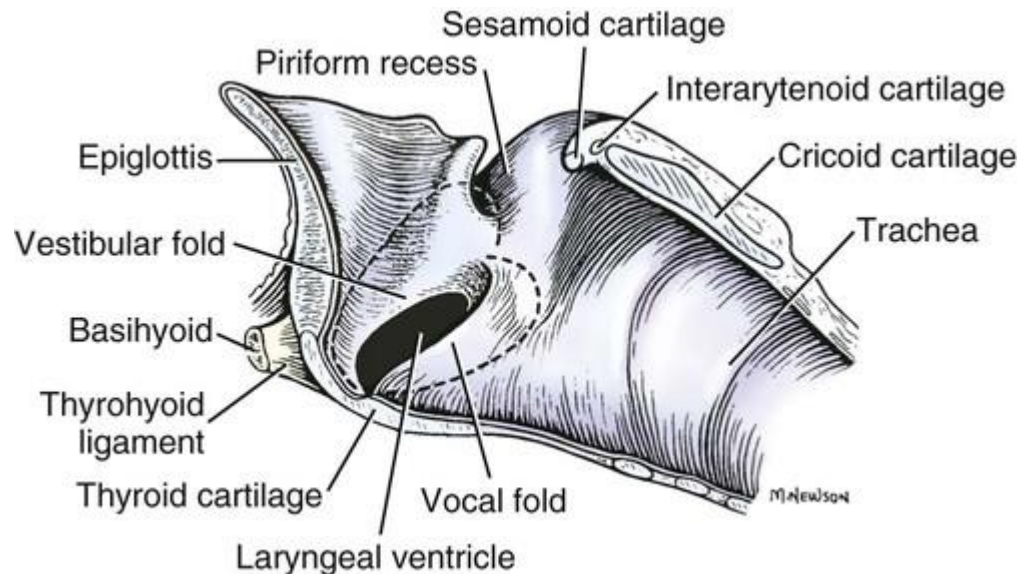
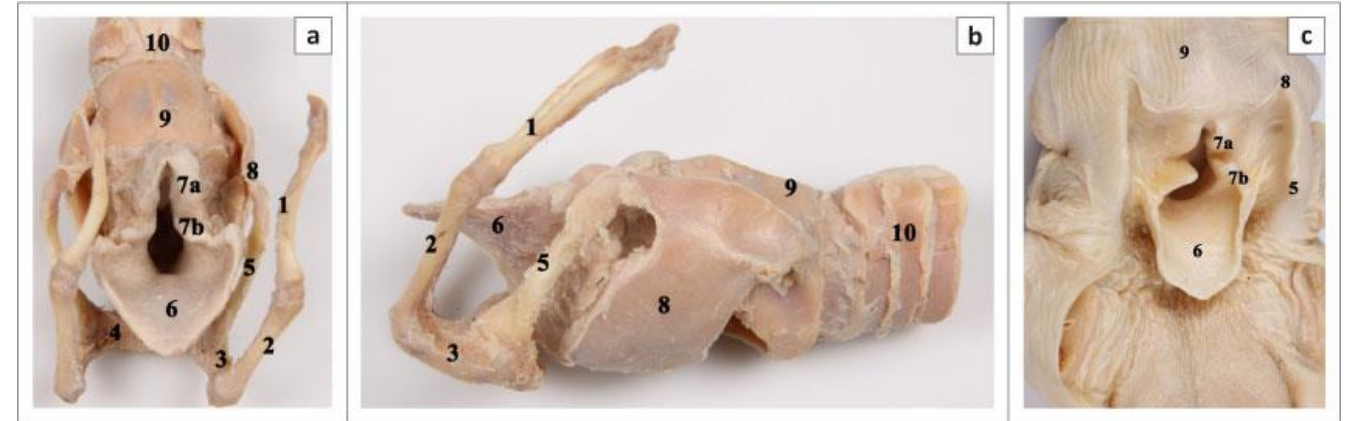


Fig. 8-19. Dorsal section of the larynx of the horse, schematic (Budras and Röck, 1994).

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

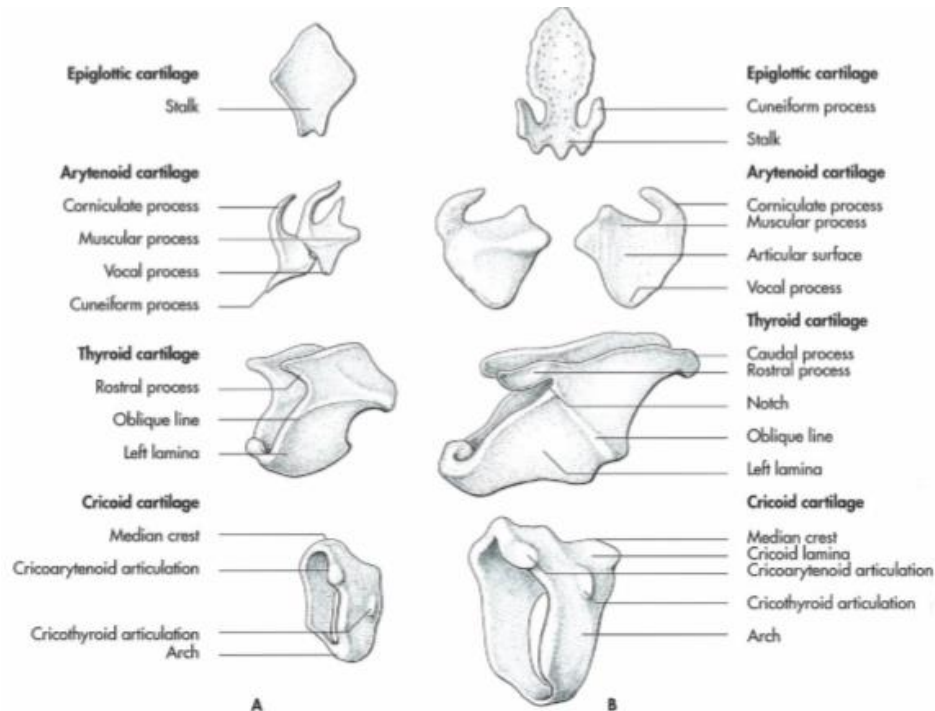
- bilden das äußere Grundgerüst des Kehlkopfs
- unpaarige, bilateralsymmetrische Gebilde
- **AUSNAHME:** die Stellknorpel



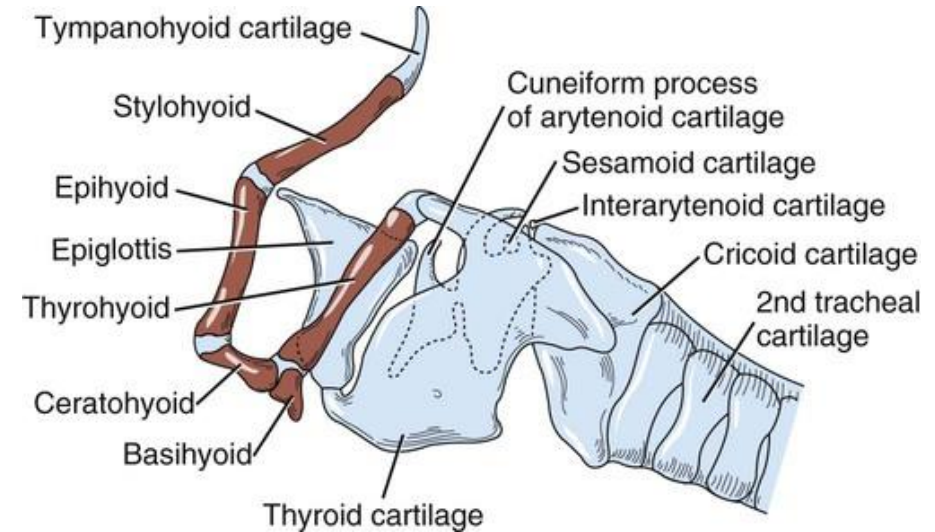
Source: Photographs by M. Doom

Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostradorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostradorsal view with the dorsal aspect of the oesophagus removed.

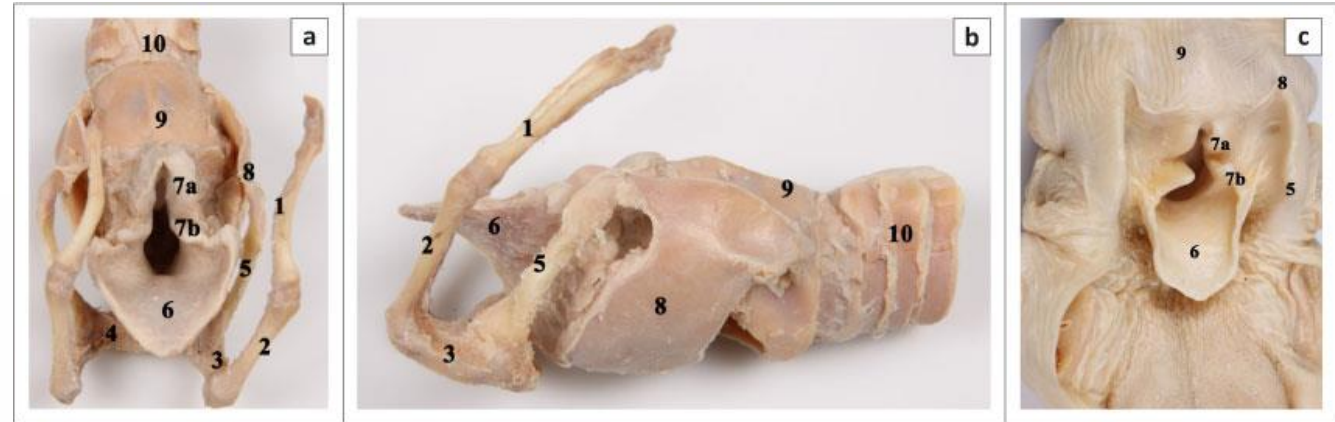


i. Laryngeal cartilages of the dog (A) and the horse (B), schematic.



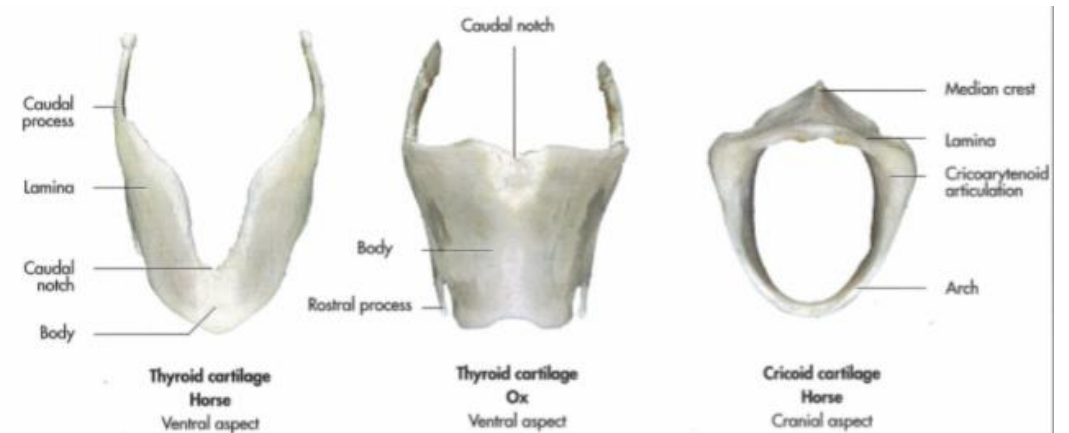
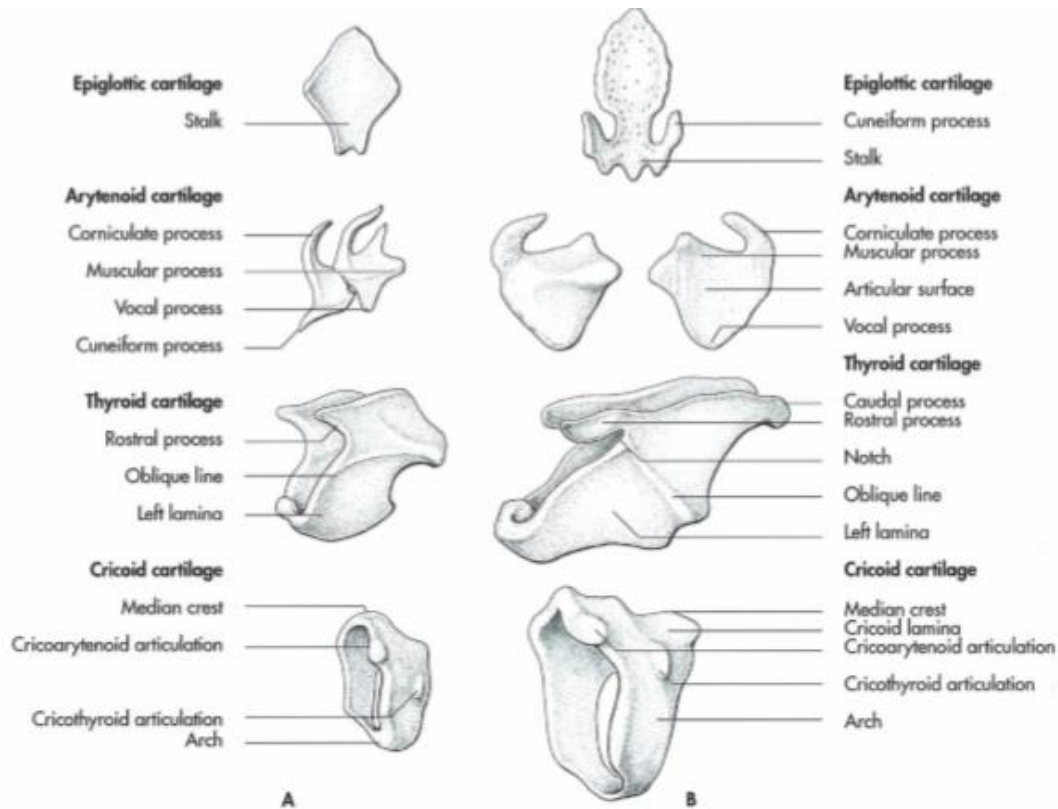
KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

1. EPIGLOTTIS (KEHLDECKEL) mit dem KEHLDECKELKNORPEL(CARTILAGO EPIGLOTTICA)
2. CARTILAGO TYHORIDEA (SCHILDKNORPEL)
3. CARTILAGO CRICOIDEA (RINGKNORPEL)
4. CARTILAGINES ARYTAENOIDEAE (STELLKNORPELN)



Source: Photographs by M. Doom
Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

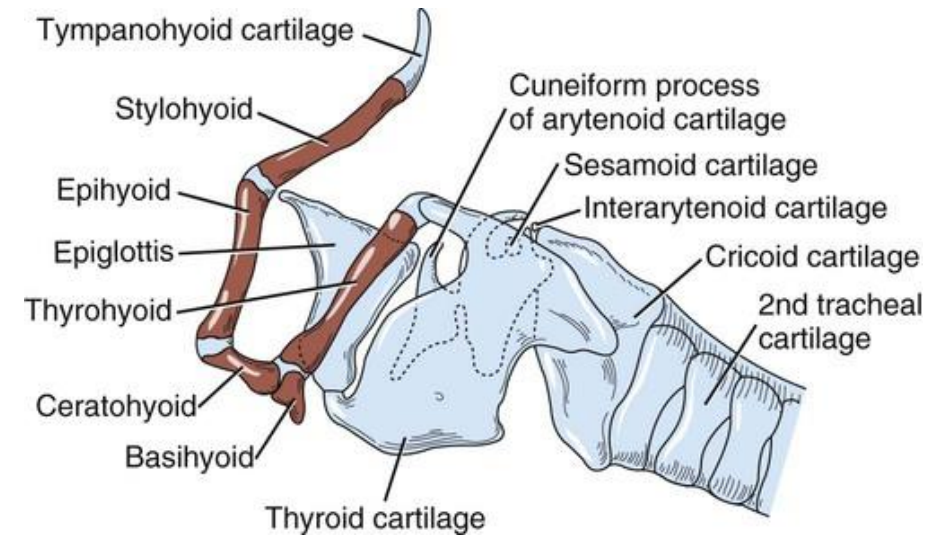
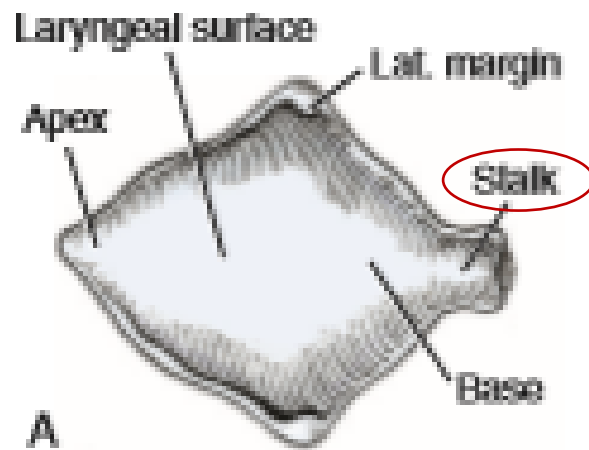
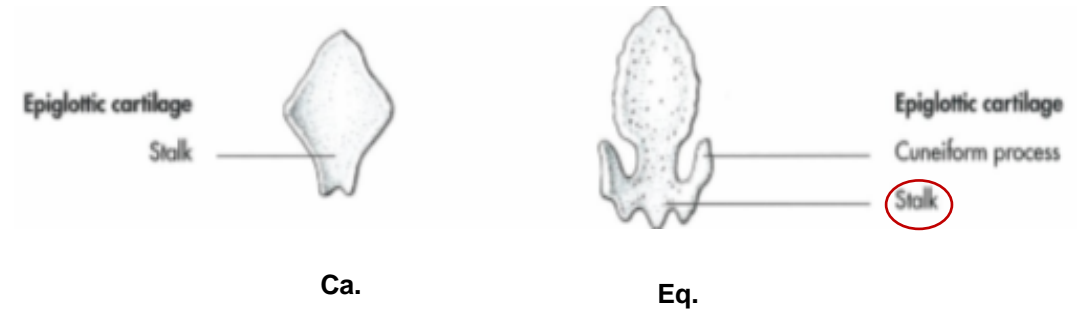
FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostro-dorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostro-dorsal view with the dorsal aspect of the oesophagus removed.



KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

EPIGLOTTIS (KEHLDECKEL):

- vom Cartilago epiglottica gestützt – elastischer Knorpel
- die Eingangsöffnung zum Kehlkopf beim Schluckakt verschließen kann
- sein STIEL (PETIOLUS) – am Schildknorpel befestigt
- seine Platte is blattförmig



KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

EPIGLOTTIS (KEHLDECKEL):

der freie Rand des Kehldeckels läuft spitz aus:

1. beim Hund
2. bei der Katze
3. beim Pferd

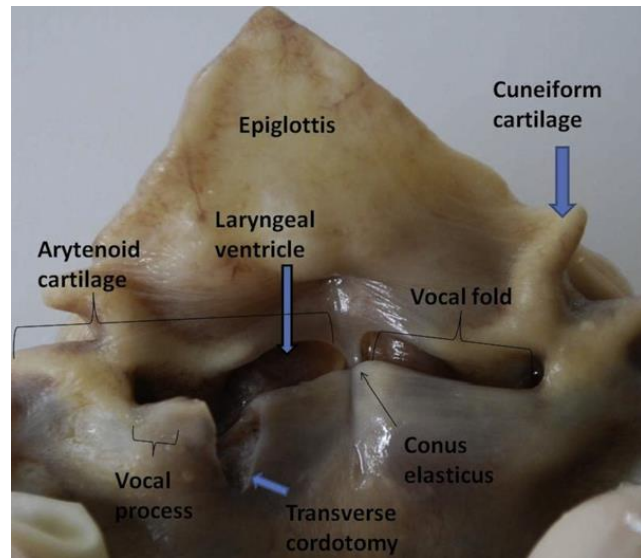
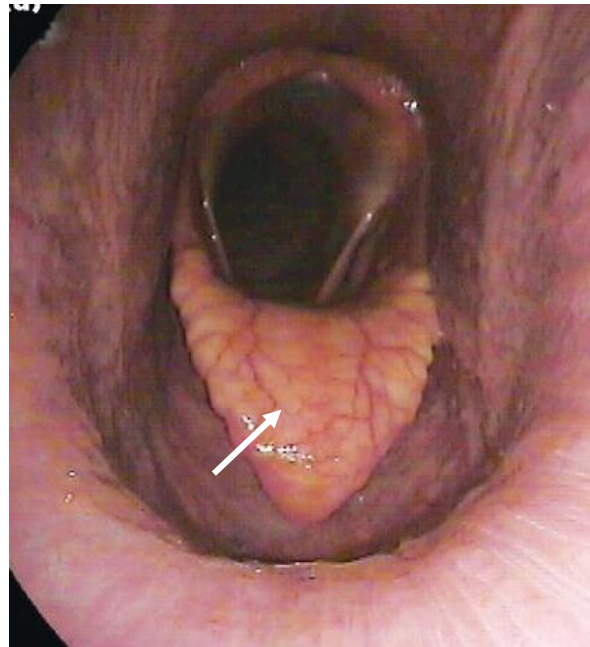


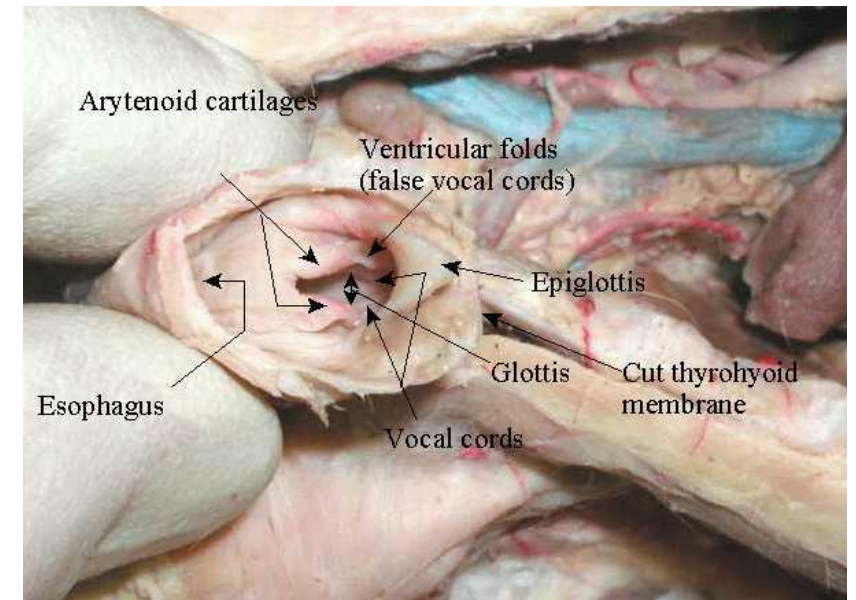
Fig. 1. Autopic laryngeal specimen from an autopsy from a normal dog, dorsal aspect. The regional anatomy and the site of the cordotomy have been highlighted on the specimen.

<https://www.sciencedirect.com/science/article/pii/S0034528810000299>



Eq

<https://inpractice.bmj.com/content/37/8/415>



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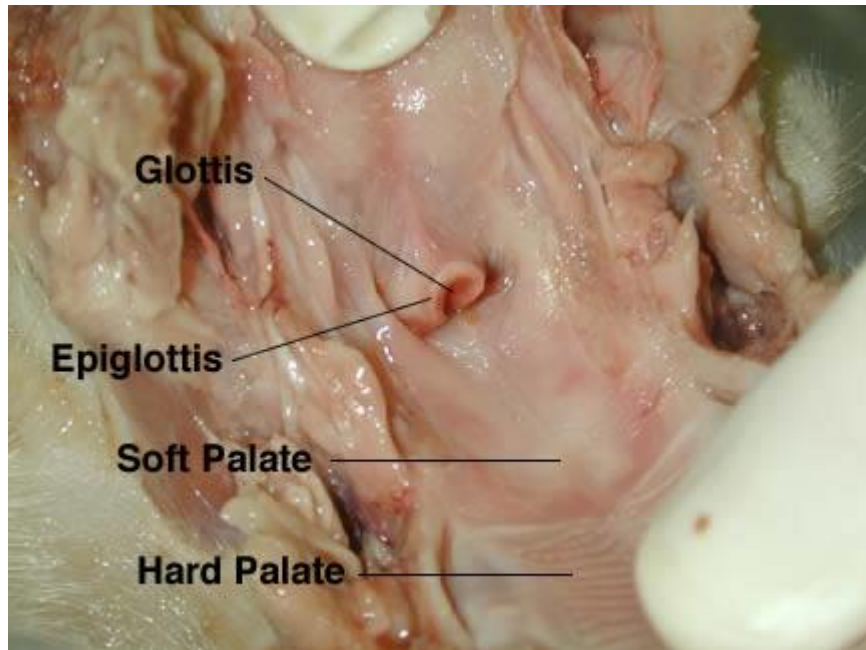
<https://fankhauserblog.wordpress.com/1993/04/08/organs-of-respiration-in-the-cat/>

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

EPIGLOTTIS (KEHLDECKEL):

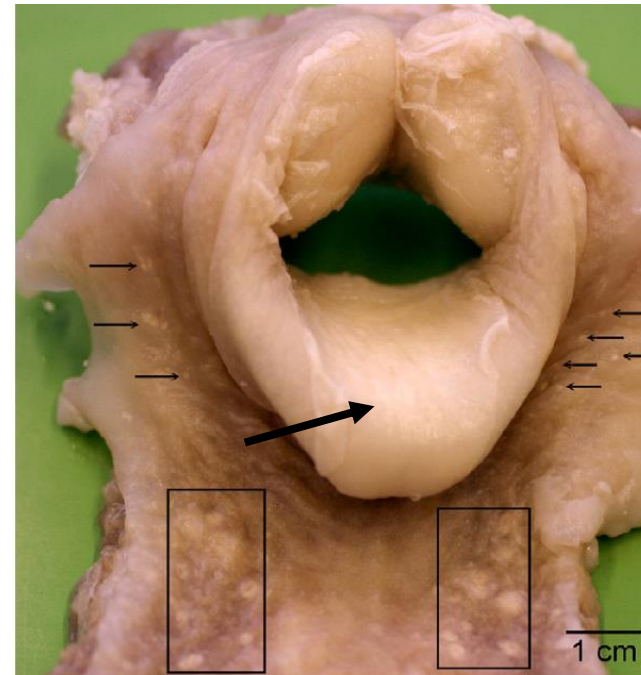
der freie Rand des Kehldeckels rundlich bis queroval geformt:

1. beim Wiederkäuer
2. beim Schwein



Su

<https://projects.ncsu.edu/cals/course/zo250/lab1-dissection.html>



Bo

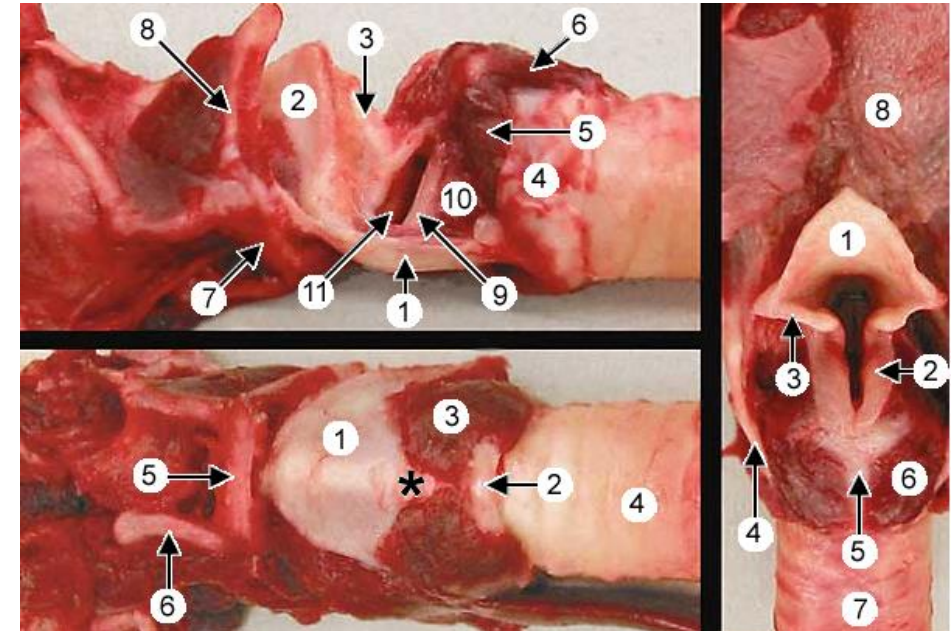
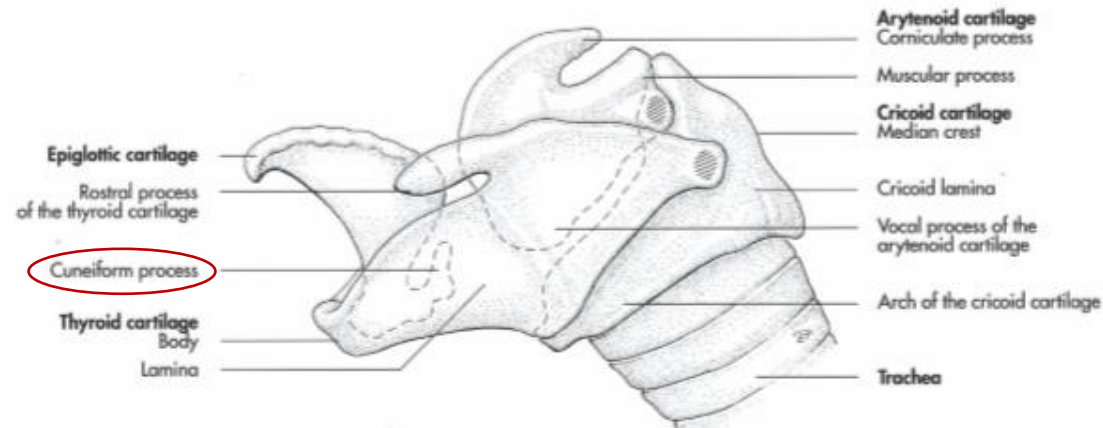
Fig. 1. Macroscopic view of the entrance to the bovine larynx showing a number of white coloured subepithelial lymphoid nodules at the base of the epiglottis (arrows) after fixation in 2% acetic acid for 24 h. Notice some tonsillar follicles belonging to the lingual tonsil (boxes) located at the root of the tongue.

[https://www.semanticscholar.org/paper/Larynx-associated-lymphoid-tissue-\(LALT\)-in-young-Casteleyn-Simoens/867a7e076dc52bccfb2660efc1482ba763fbcdf4/figure/0](https://www.semanticscholar.org/paper/Larynx-associated-lymphoid-tissue-(LALT)-in-young-Casteleyn-Simoens/867a7e076dc52bccfb2660efc1482ba763fbcdf4/figure/0)

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

PROCESSUS CUNEIFORMIS:

- seitlich vom Stile der Cartilago epiglottica
- paariger Knorpel
- liegt zwischen Epiglottis und Stellknorpel in der Plica aryepiglottica



Three views of the larynx (fresh tissue). *Right:* epiglottic cartilage (1), arytenoid cartilages (2), aryepiglottic fold (3), thyroid cartilage (4), cricoarytenoideus dorsalis m. (6), trachea (7), and root of the tongue (8).

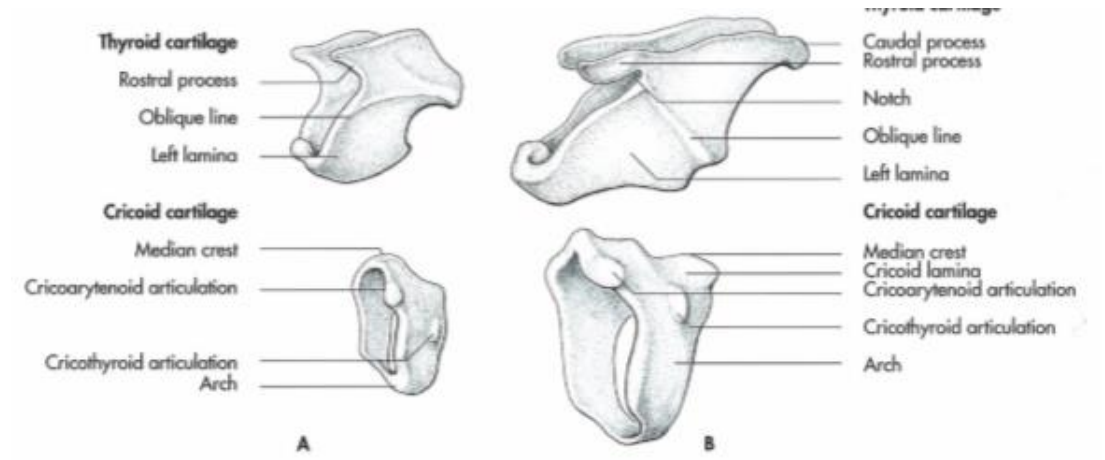
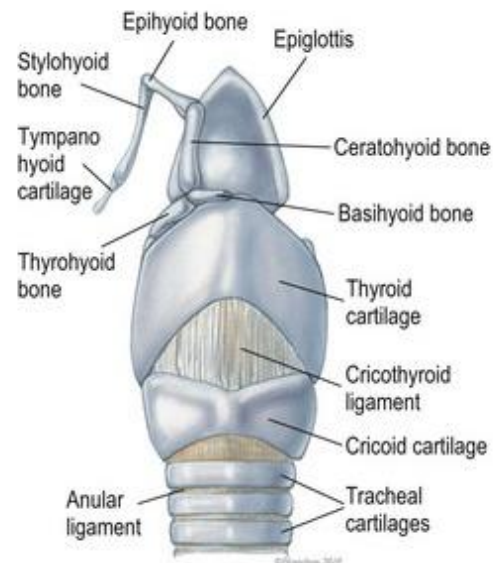
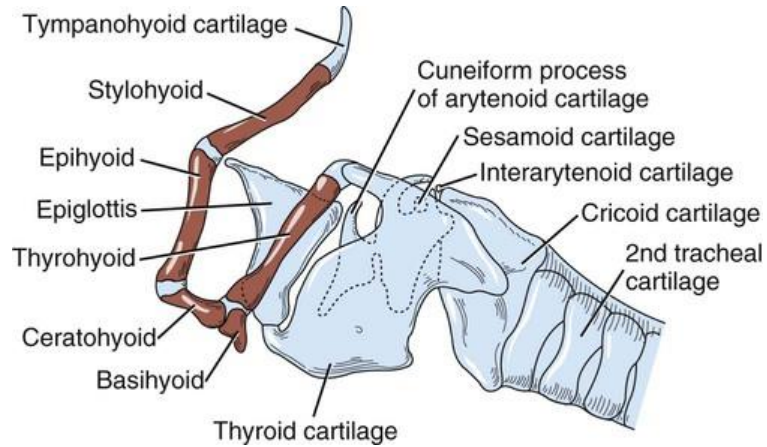
Left top: The left side of the larynx has been removed. Identify: thyroid cartilage (1), epiglottic cartilage (2), arytenoid cartilage (3), cricoid cartilage (4), cricoarytenoideus lateralis m. (5), cricoarytenoideus dorsalis m. (6), basihyoid bone (7), and thyrohyoid bone (8). Notice the vocal ligament (9) and vocalis m. (10) of the vocal fold (covering mucosa removed). The laryngeal ventricle (11) is just rostral to the vocal fold.

Left bottom: thyroid cartilage (1), cricoid cartilage (2), cricothyroid ligament (asterisk), cricothyroideus m. (3), trachea (4), basihyoid bone (5), and ceratohyoid bone (6).

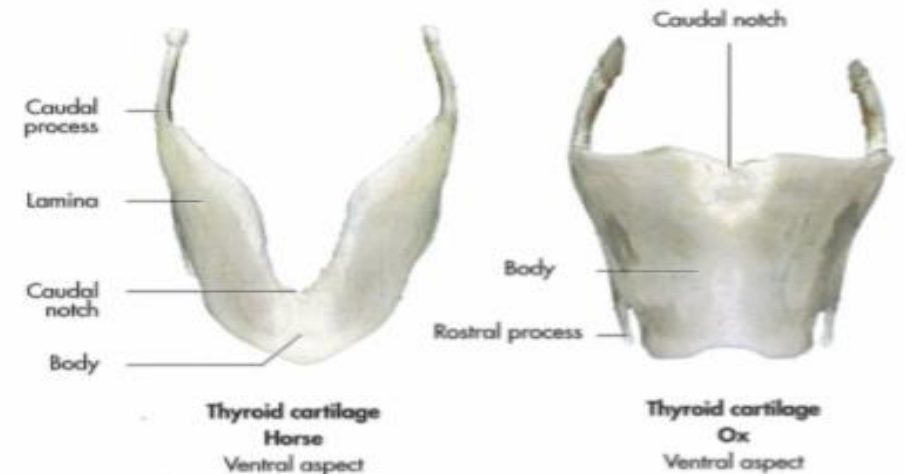
KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO TYHORIDEA (SCHILDKNORPEL):

- bildet die Seitewände und den Boden des Kehlkopfs
- hyaliner Knorpel



k. Laryngeal cartilages of the dog (A) and the horse (B), schematic.

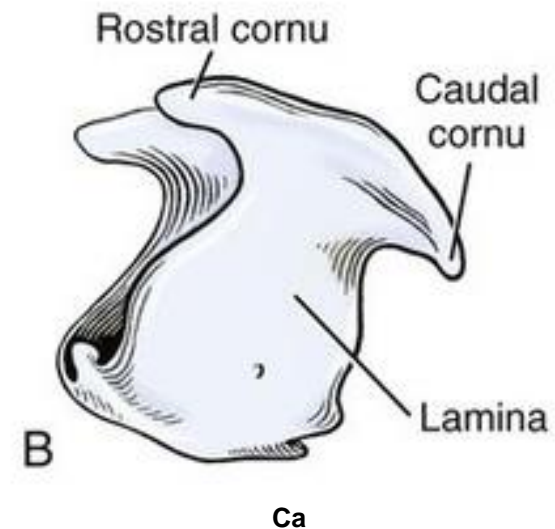
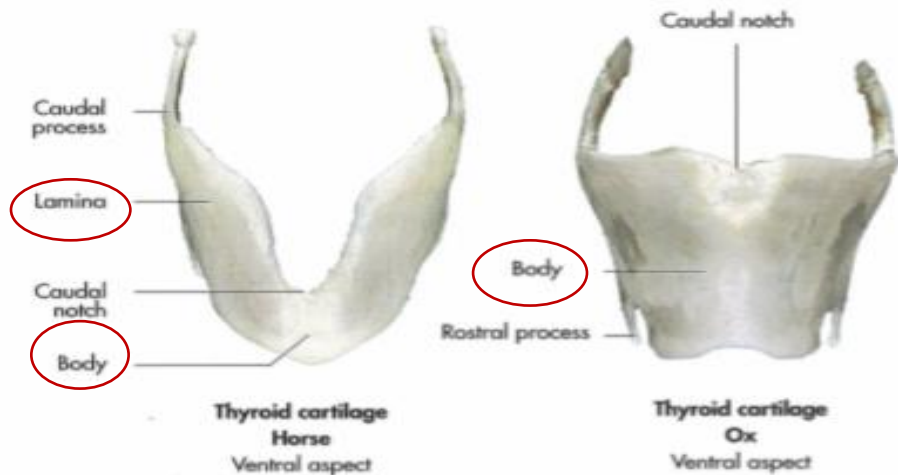
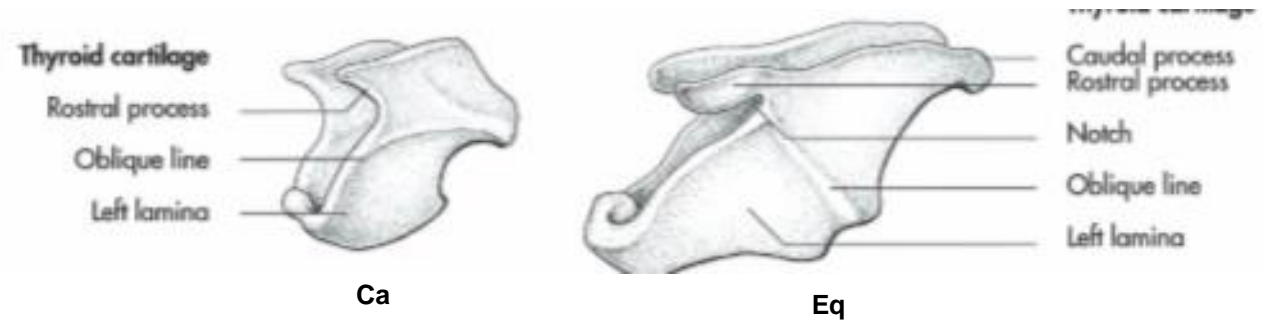


KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO THYROIDEA (SCHILDKNORPEL):

besitzt:

1. ventralen Körper
2. Seitenplatten
 - a. Lamina dextra
 - b. Lamina sinistra



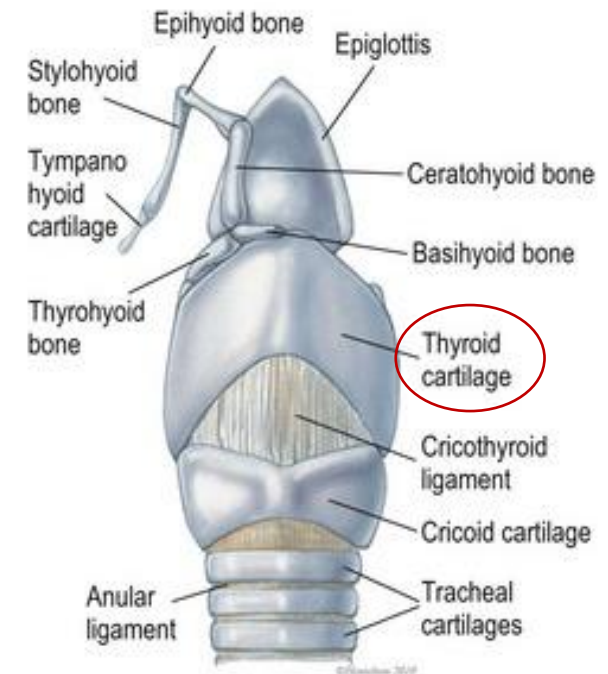
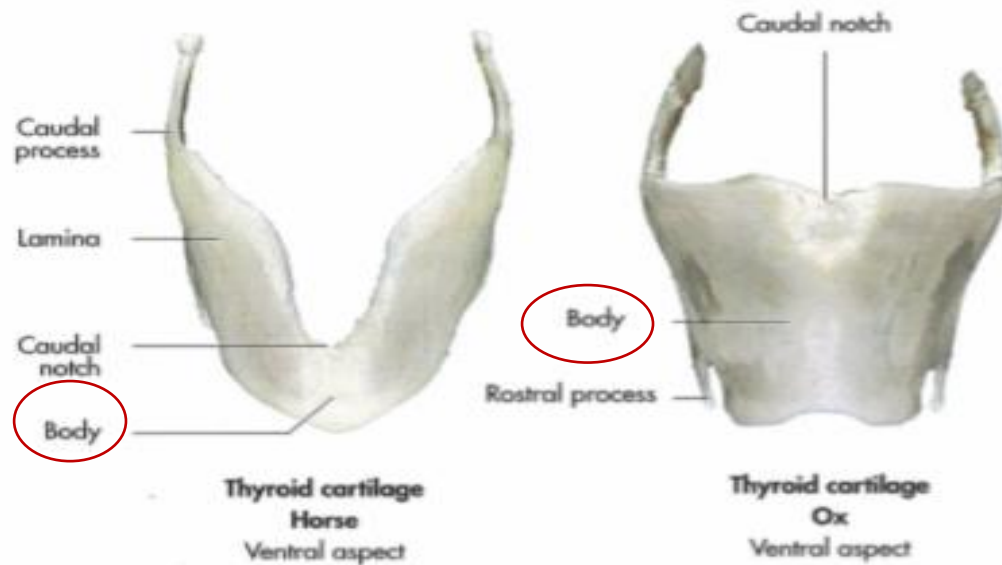
KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO TYHORIDEA (SCHILDKNORPEL):

KÖRPER:

bei allen Haussäugetieren

- bildet einen vollständigen Boden der Kehlkopfröhre



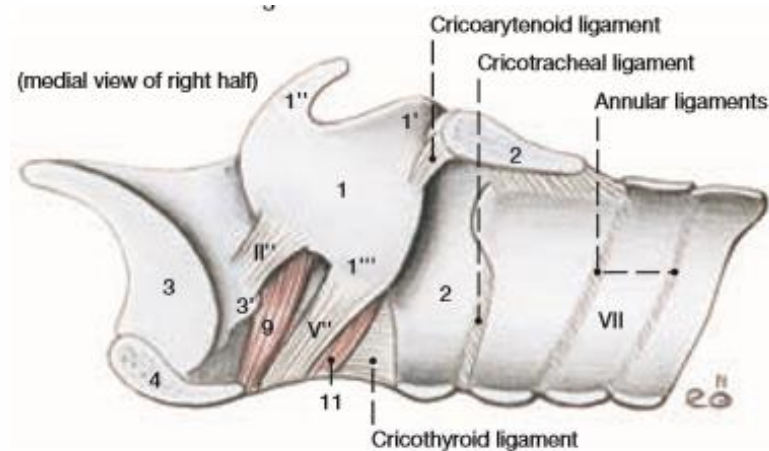
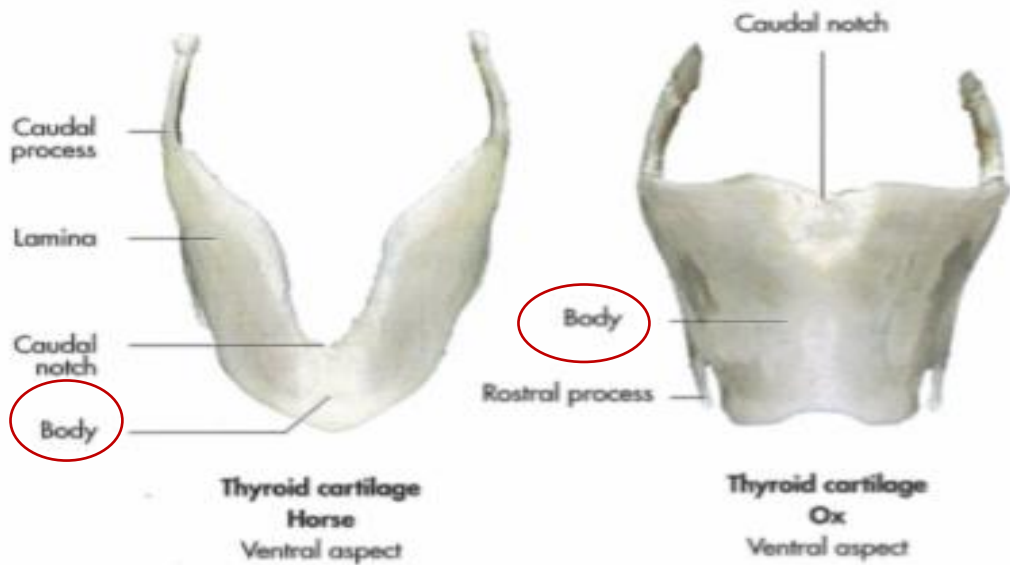
KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO TYHORIDEA (SCHILDKNORPEL):

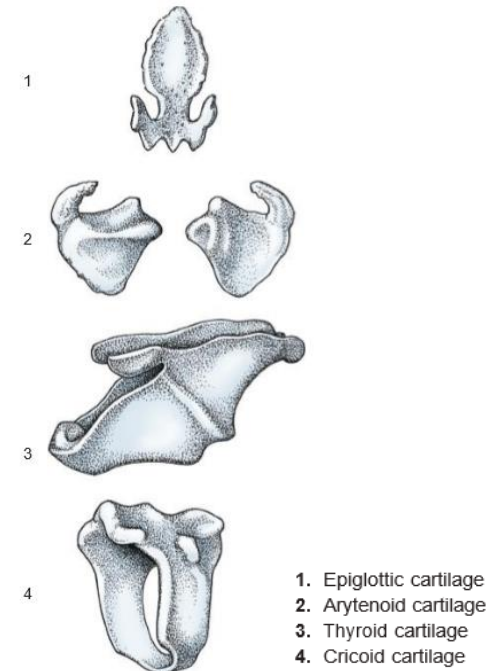
KÖRPER:

beim Pferd:

- besteht aus einem schmalen, rostral gelegenen Steg, dem die Epiglottis aufsitzt
- kaudal dieses Steges wird der Kehlkopfboden in der Incisura thyroidea caudalis durch eine Bindegewebsplatte verschlossen - an dieser Stelle von ventral in die Kehlkopfhöhle bei der Operation des KehlkopffEIFENS eingegangen werden kann



- 3. Epiglottis
- 4. Cartilago thyroidea



KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO THYROIDEA (SCHILDKNORPEL):

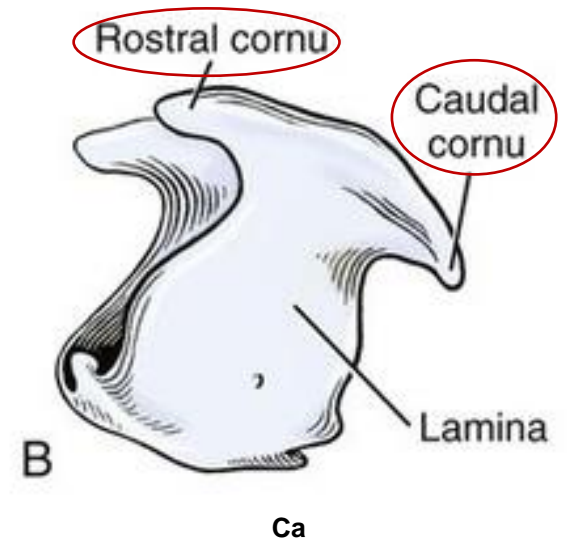
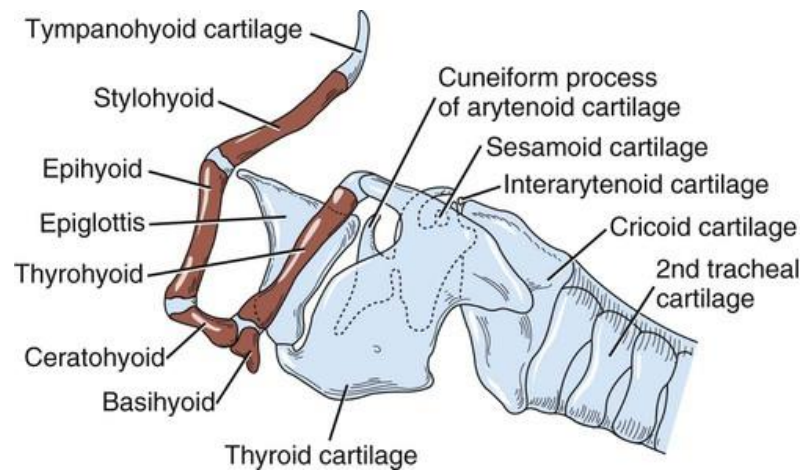
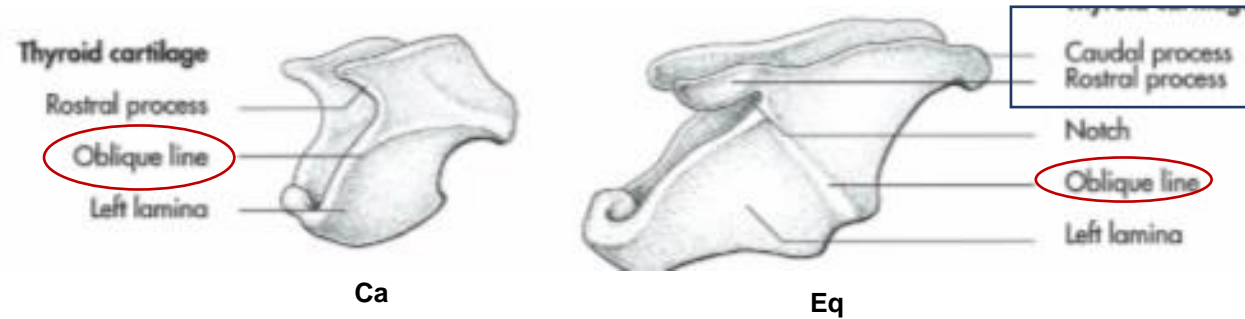
SEITENPLATTEN:

a. Lamina dextra

b. Lamina sinistra

besitzen:

- Linea obliqua
- Cornu caudale - artikuliert mit dem Ringknorpel
- Cornu rostrale – artikuliert mit dem Kehlkopfhorn des Zungenbeins



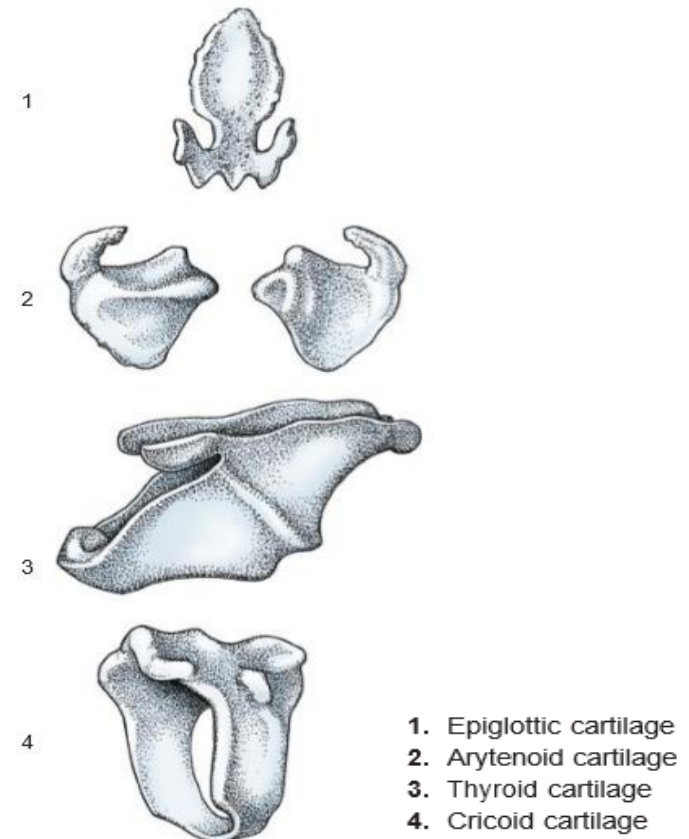
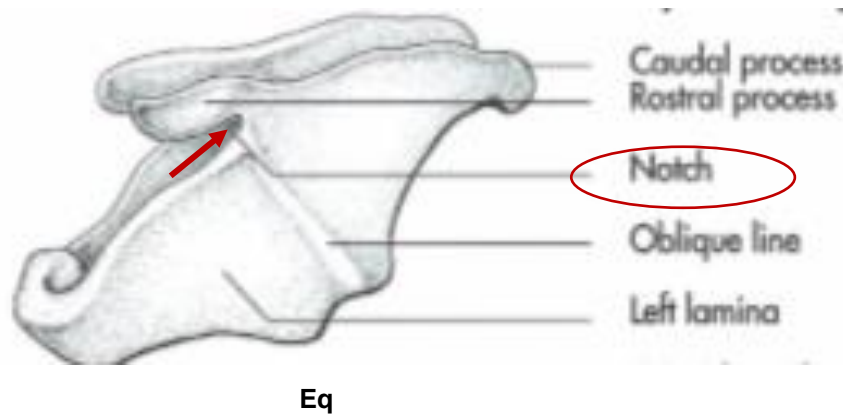
KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO TYHORIDEA (SCHILDKNORPEL):

SEITENPLATTEN:

- unter dem Cornu rostrale beim Pferd:

- ein Einschnitt – Fissura thyroidea vorhanden



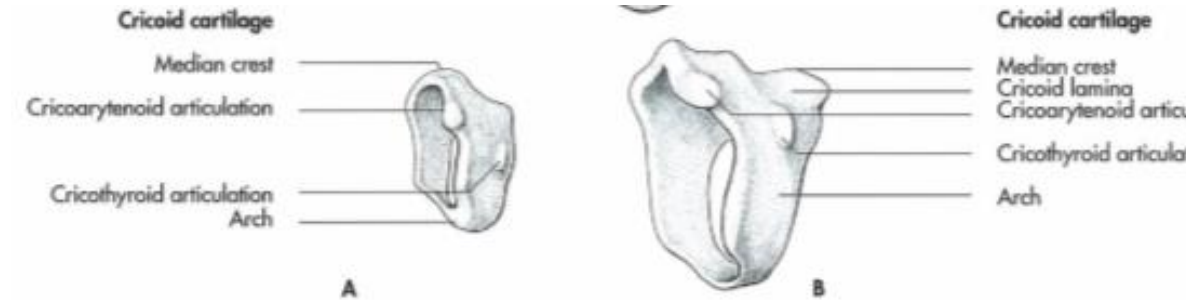
KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO CRICOIDEA (RINGKNORPEL):

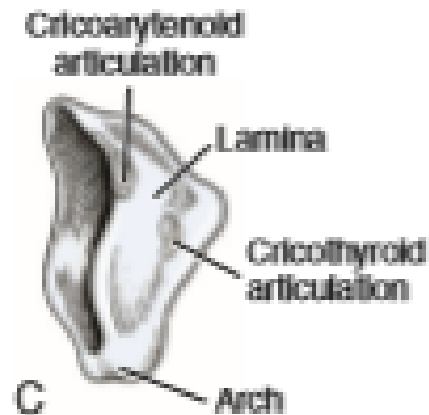
- umgibt das Kaudalende des Kehlkopfs
- hyaliner Knorpel
- besitzt die Gestalt eines Siegelrings



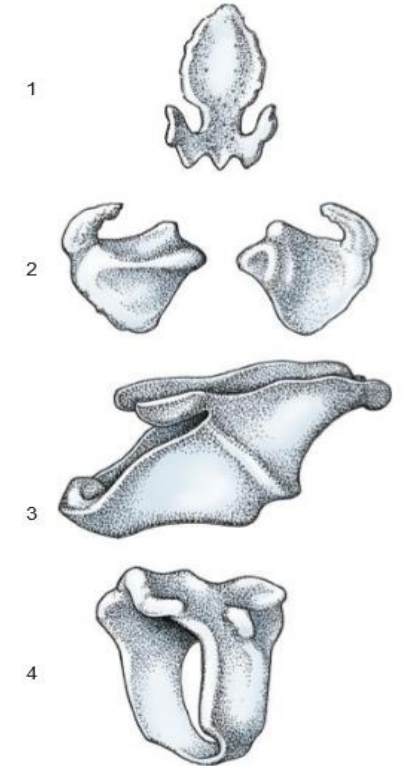
Cricoid cartilage
Horse
Cranial aspect



k. Laryngeal cartilages of the dog (A) and the horse (B), schematic.



Ca



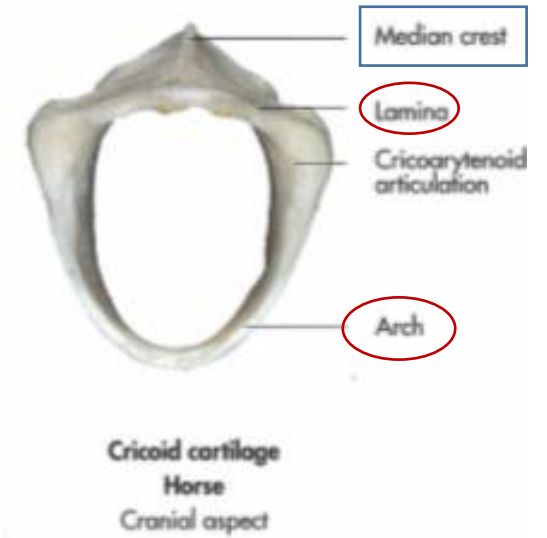
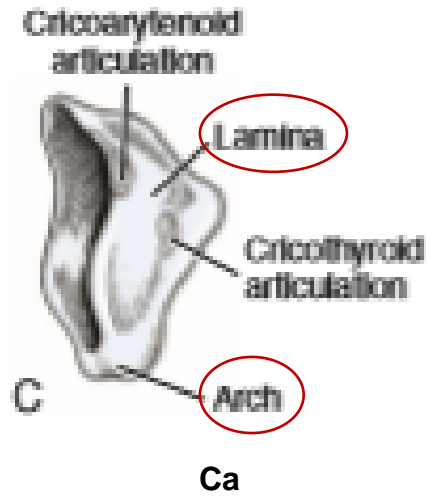
1. Epiglottic cartilage
2. Arytenoid cartilage
3. Thyroid cartilage
4. Cricoid cartilage

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO CRICOIDEA (RINGKNORPEL):

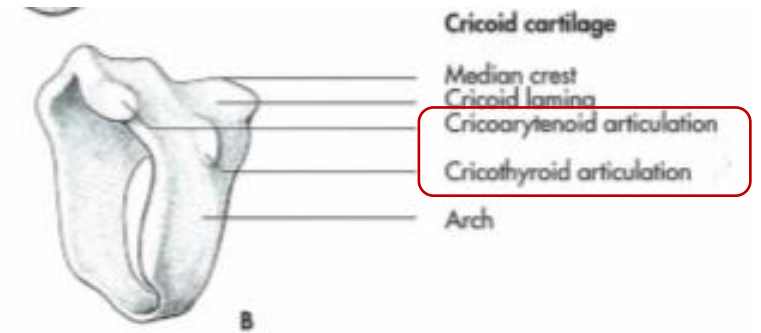
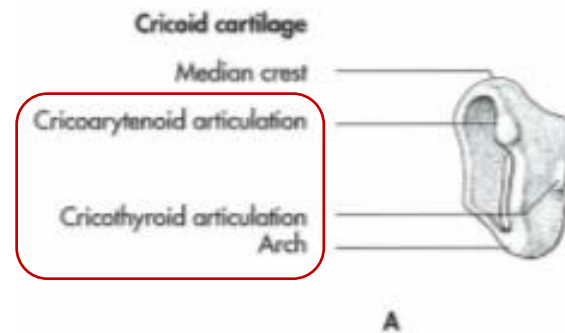
1. Ringknorpelplatte (Lamina cartilaginis cricoideae)

- dorsaler Teil
- Crista mediana – Muskelkamm
- Facies articularis arytenoidea – Gelenkfläche für Stellknorpel



2. Rostralrand (Arcus cartilaginis cricoideae)

- Facies articularis thyroidea



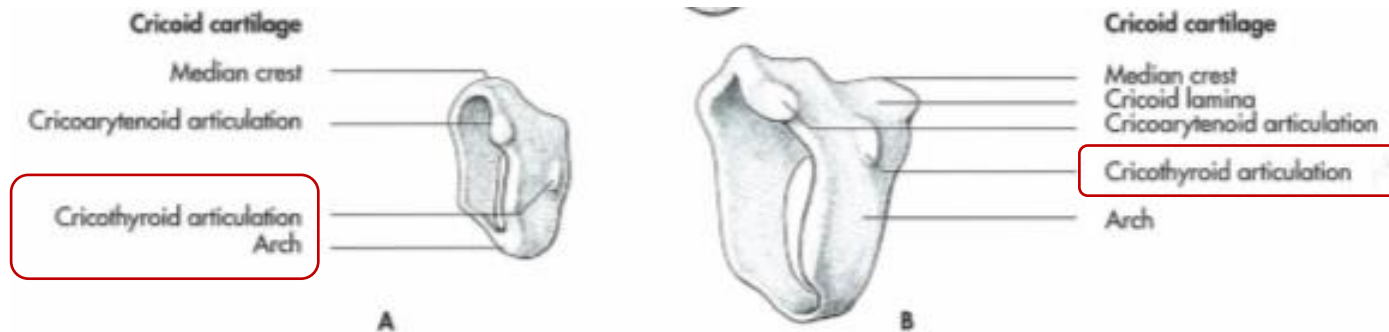
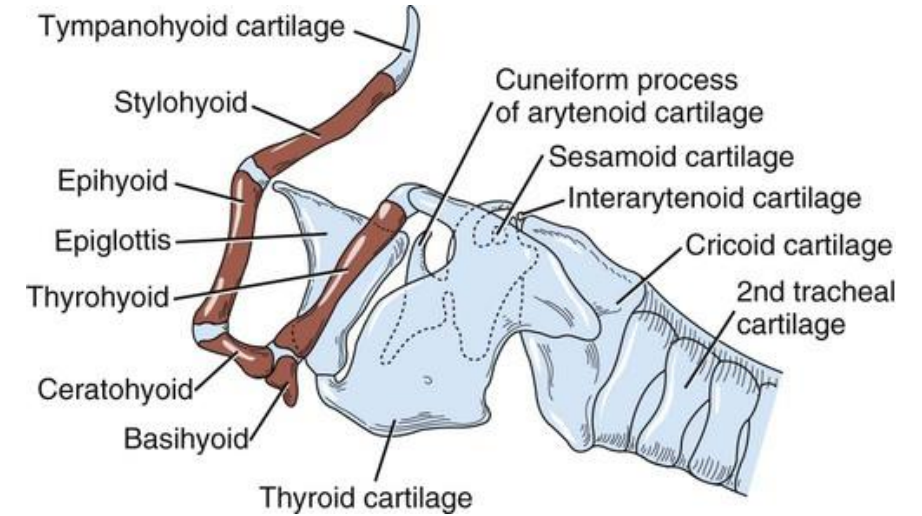
1. Laryngeal cartilages of the dog (A) and the horse (B), schematic.

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGO CRICOIDEA (RINGKNORPEL):

FACIES ARTICULARIS THYROIDEA:

- am Übergang zwischen Lamina cartilaginis cricoideae und Arcus cartilaginis cricoideae
- Verbindung mit den Kaudalhörnern des Schildknorpels



i. Laryngeal cartilages of the dog (A) and the horse (B), schematic.

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGINIS ARYTAENOIDEAE (STELLKNORPEL):

- paarig
- hyaliner Knorpel
- dreieckig

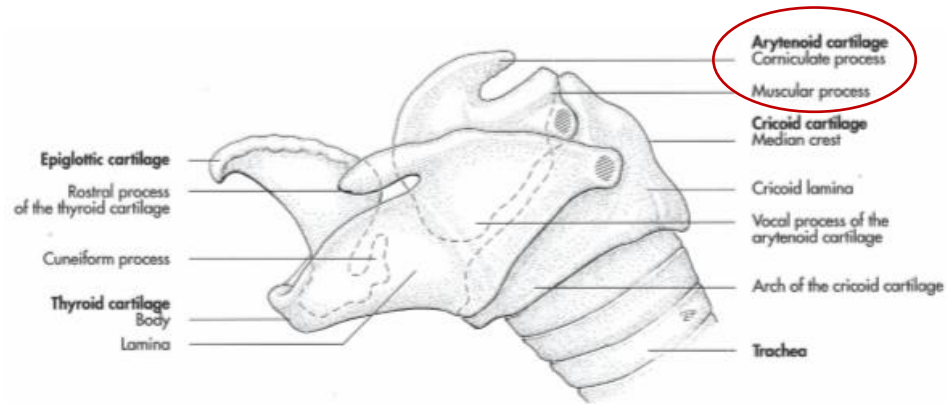


FIGURE 8-13 Laryngeal cartilages disarticulated. A, Epiglottis, dorsal aspect. B, Thyroid cartilage, lateral aspect. C, Cricoid cartilage, lateral aspect. D, Left arytenoid cartilage, lateral aspect. E, Left arytenoid cartilage, medial aspect. F, Interarytenoid cartilage. G, Sesamoid cartilage, dorsal aspect.

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGINIS ARYTAENOIDEAE (STELLKNORPEL):

1. rostradorsale Ecke:

- trägt den Processus corniculatus

2. Processus corniculatus:

- hornartig dorsal gerichtet
- bildet mit dem der gegenüberliegenden Seite eine Rinne – Gießkannenknorpel benannt ist

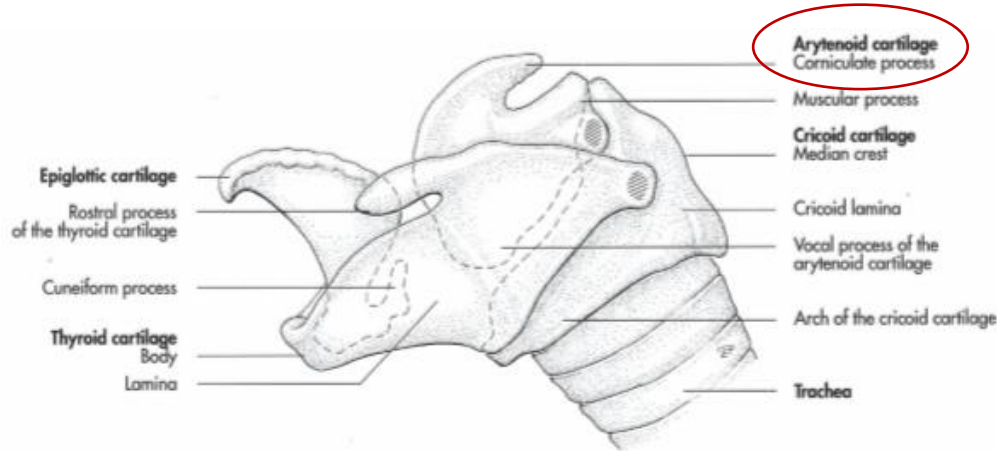


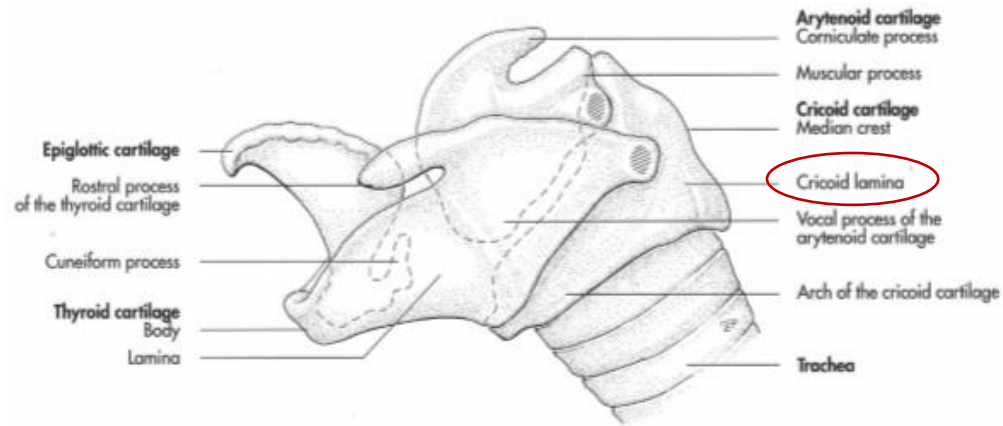
FIGURE 8-13 Laryngeal cartilages disarticulated. A, Epiglottis, dorsal aspect. B, Thyroid cartilage, lateral aspect. C, Cricoid cartilage, lateral aspect. D, Left arytenoid cartilage, lateral aspect. E, Left arytenoid cartilage, medial aspect. F, Intersarytenoid cartilage. G, Sesamoid cartilage, dorsal aspect.

KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

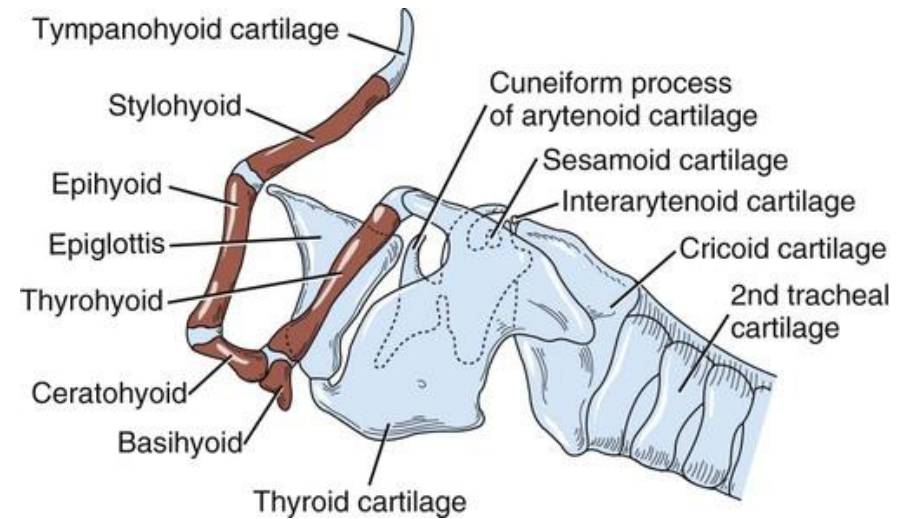
CARTILAGINIS ARYTAENOIDEAE (STELLKNORPEL):

3. kaudales Ecke:

- verbindet sich gelenkig mit der Platte des Ringknorpels



. Laryngeal cartilages of the horse, schematic.

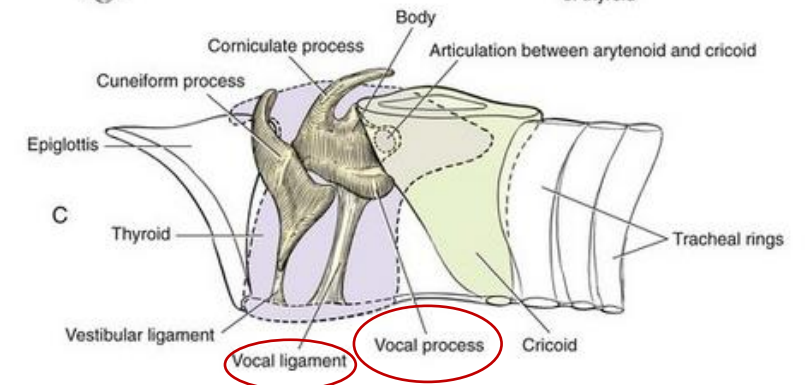
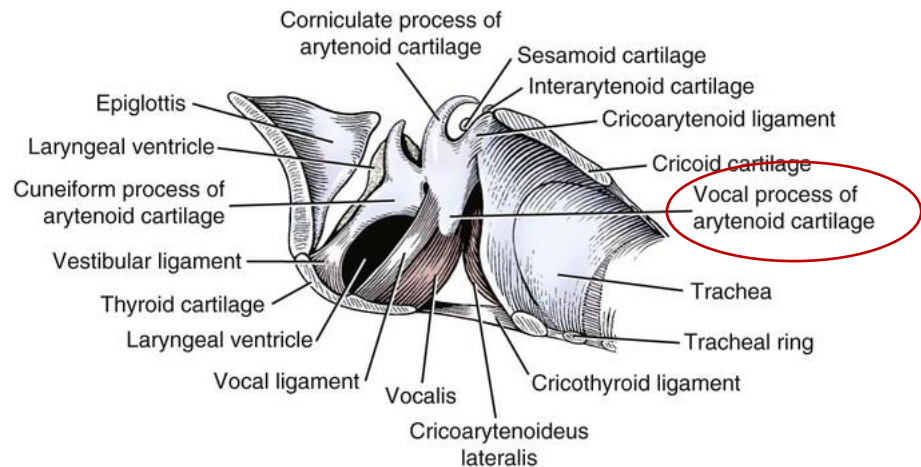
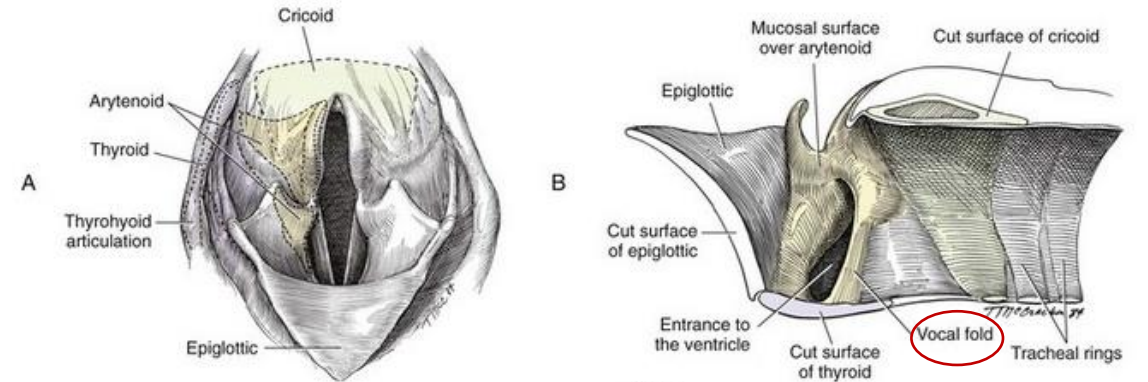


KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGINIS ARYTAENOIDEAE (STELLKNORPEL):

4. ventrales Ecke:

- zieht sich zum **Processus vocalis** aus
- bietet dem elastischen Stimmband (**Lig. vocale**) Ansatz

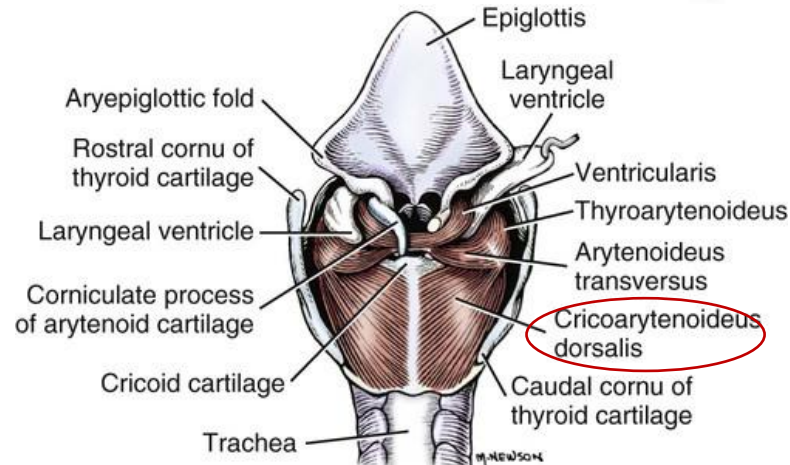
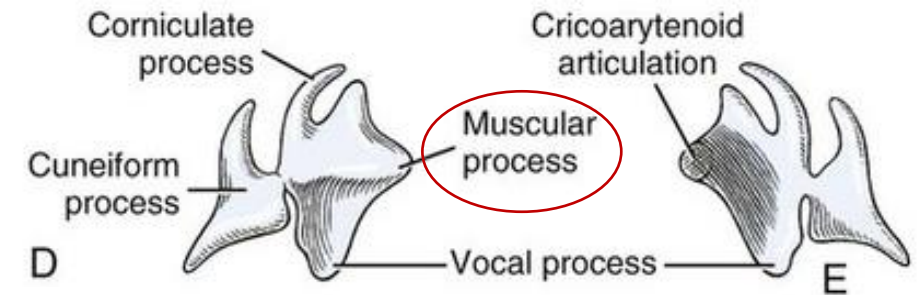
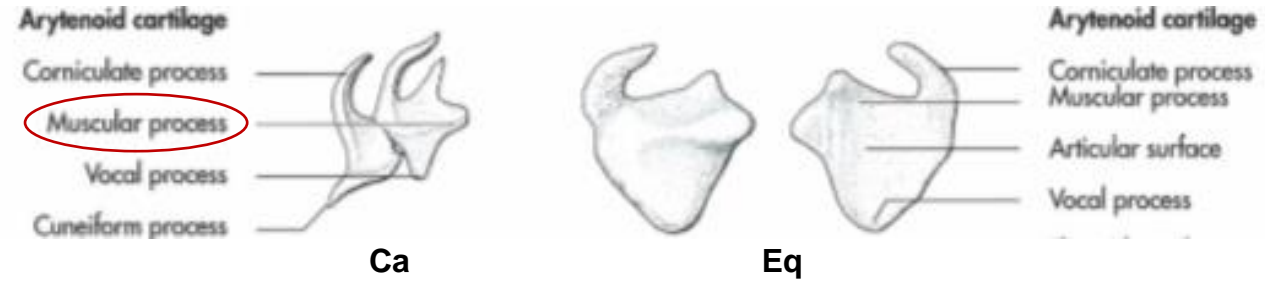
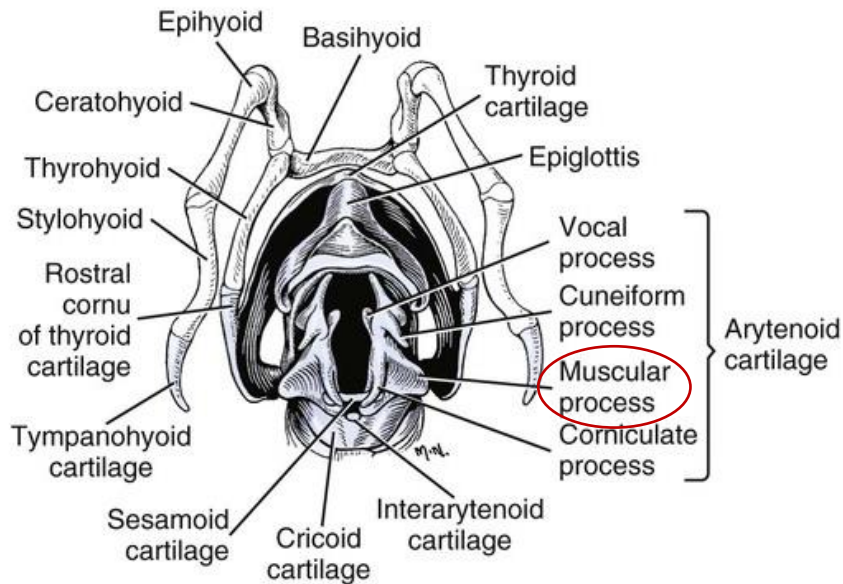


KEHLKOPFKNORPEL (CARTILAGINES LARYNGIS)

CARTILAGINIS ARYTAENOIDEAE (STELLKNORPEL):

5. Muskelfortsatz:

- liegt dorsal
- zeigt lateral
- Ansatzstelle für den *M. cricoarythenoideus dorsalis*



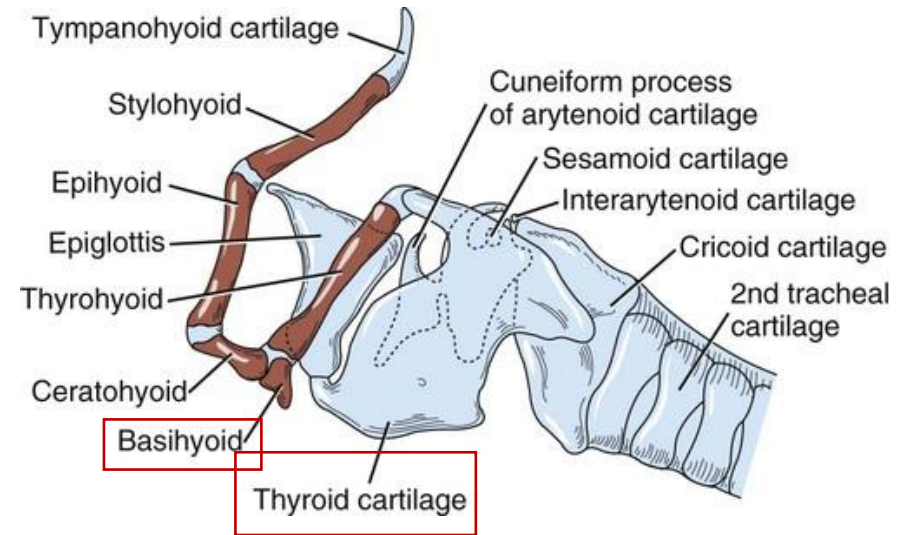
KEHLKOPFBÄNDER

SCHILDKNORPEL – ZUNGENBEINVERBINDUNG:

MEMBRANA THYROHYOIDEA

zwischen:

- dem rostralen Rand der Platten des Schildknorpels
- den Kehlkopfästen
- dem Basohyoideum
- bei Flfr. an Stelle des Gelenks eine Synchondrose ausgebildet

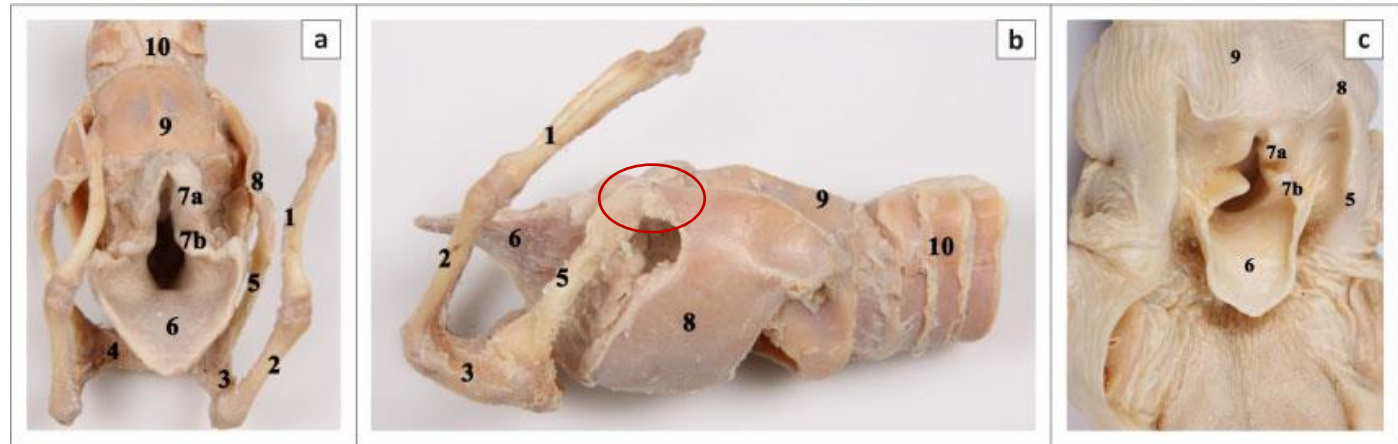


KEHLKOPFBÄNDER

GELENKIGE SCHILDKNORPEL – ZUNGENBEINVERBINDUNG:

ARTICULATIO THYROHYOIDEA:

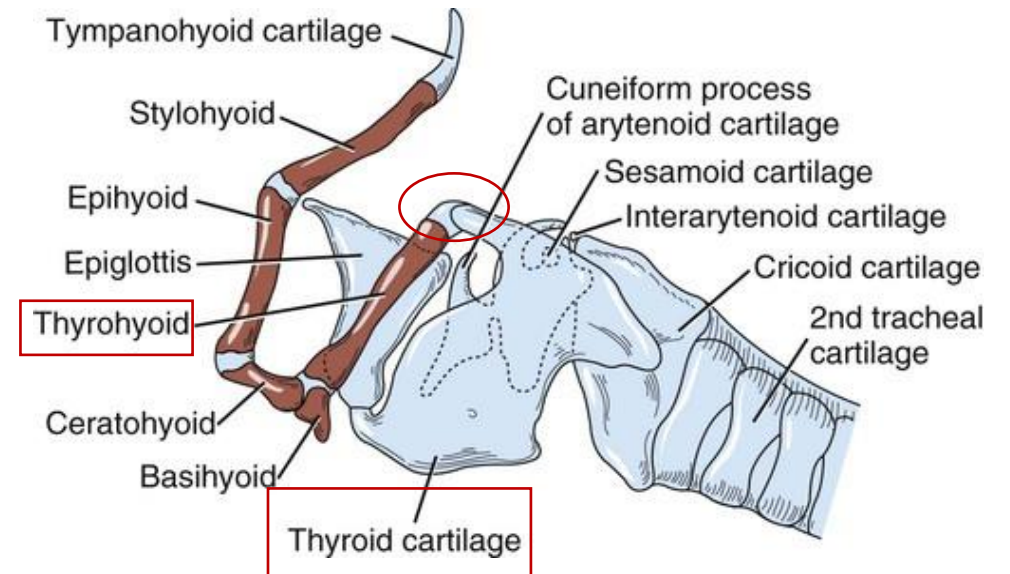
- vom Rostralhorn der Cartilago thyroidea
- vom Kehlkopf fast des Zungenbeins - Thyrohyoideum



Source: Photographs by M. Doom

Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostradorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostradorsal view with the dorsal aspect of the oesophagus removed.

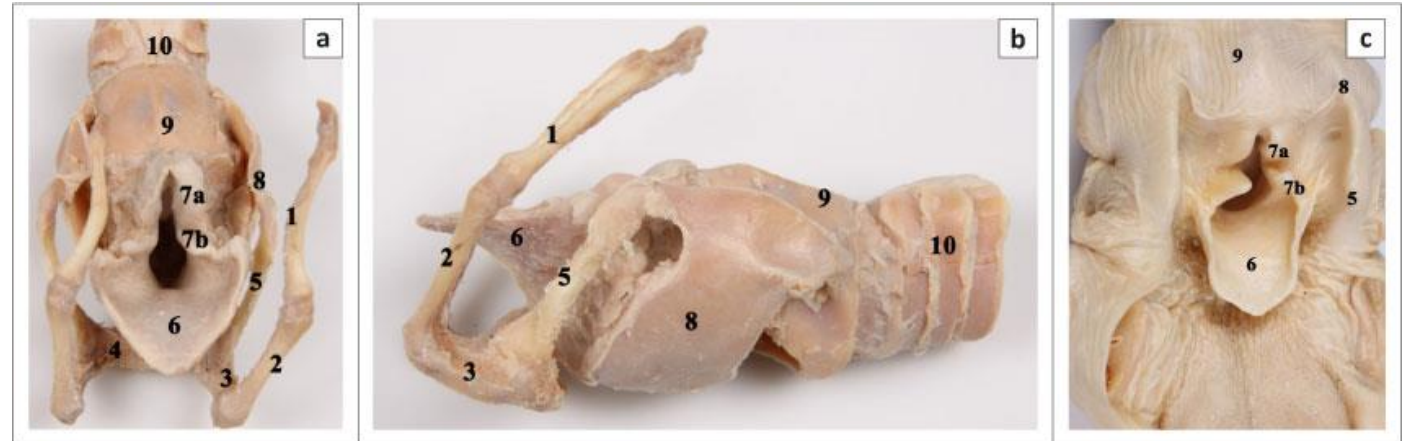


KEHLKOPFBÄNDER

KEHLDECKEL - SCHILDKNORPELVERBINDUNG:

LIGAMENTUM THYROEPIGLOTTICUM:

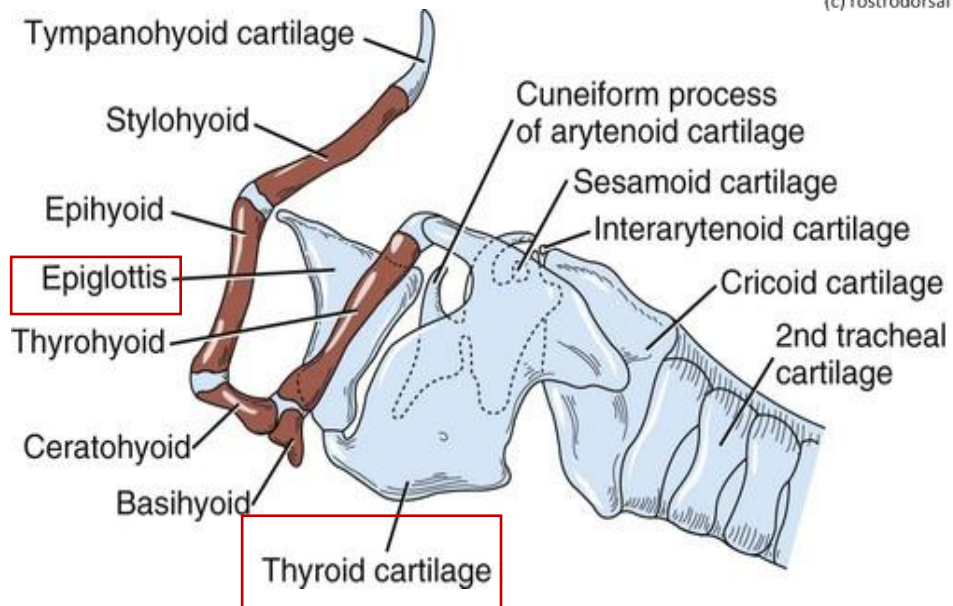
- zwischen Kehildeckelbasis und Schildknorpel



Source: Photographs by M. Doom

Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostrodorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostrodorsal view with the dorsal aspect of the oesophagus removed.

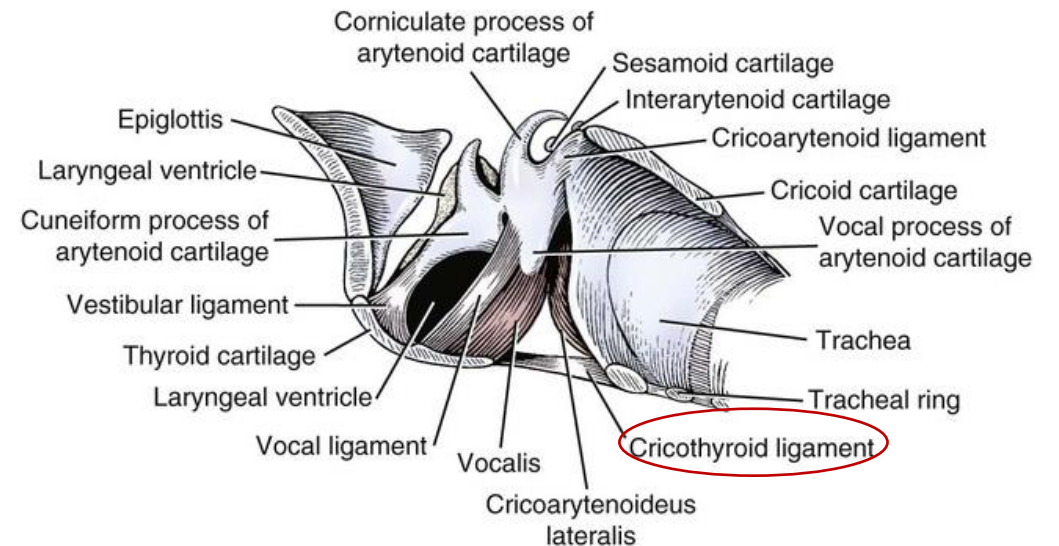
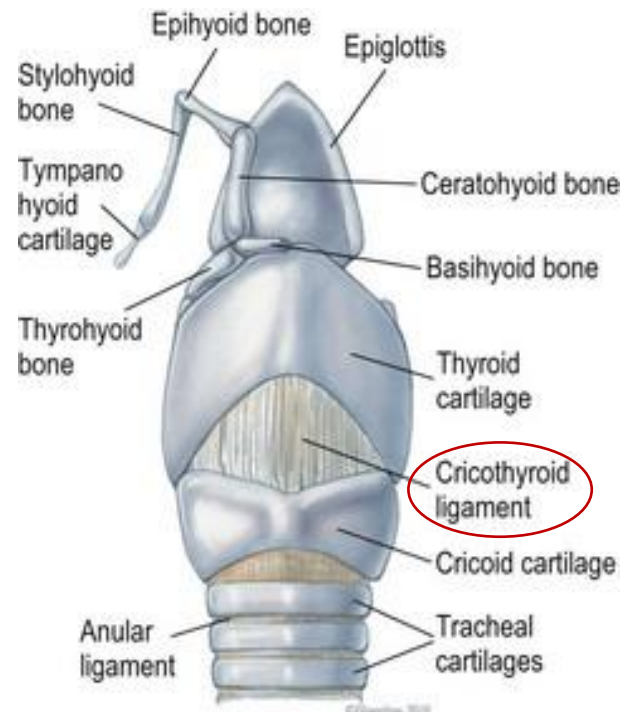


KEHLKOPFBÄNDER

RINGKORPEL- SCHILDKORPELVERBINDUNG:

LIGAMENTUM CRICOTHYROIDEUM

- seitlich und ventral zwischen Ring – und Schildknorpel
- beim Pferd – verschleißt die Incisura thyroidea caudalis in Form eine Platte – bei medianem Durchschneiden dieser Platte kann man von ventral ohne Durchtrennung des Schildknorpels in die Kehlkopfhöhle gelangen – „Kehlkopfpfeifer – Operation“

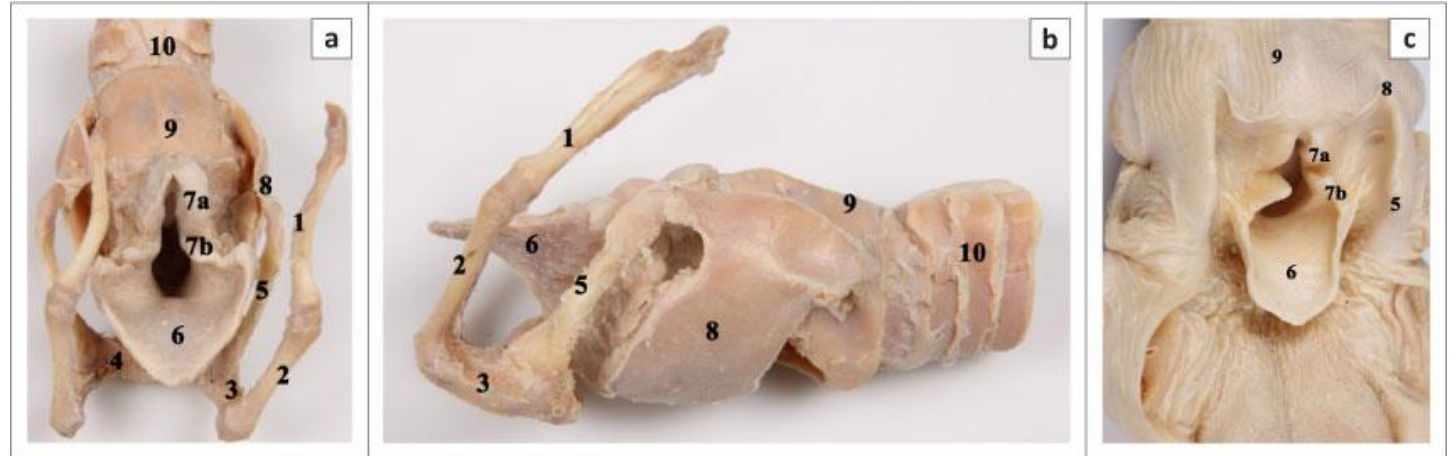


KEHLKOPFBÄNDER

KEHLDECKEL - ZUNGENBEINVERBINDUNG:

LIGAMENTUM HYOEPIGLOTTICUM:

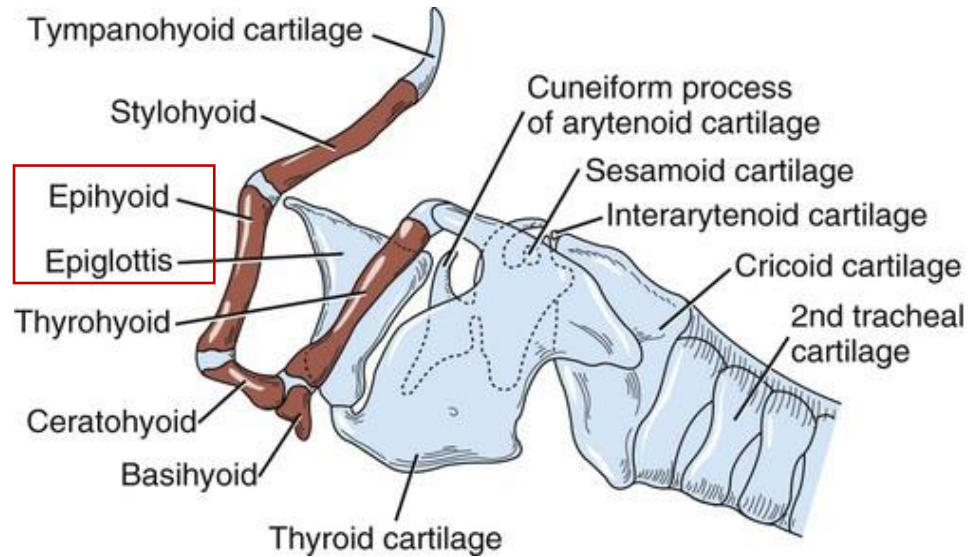
- verbindet mit dem M. hyoepiglotticus



Source: Photographs by M. Doom

Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

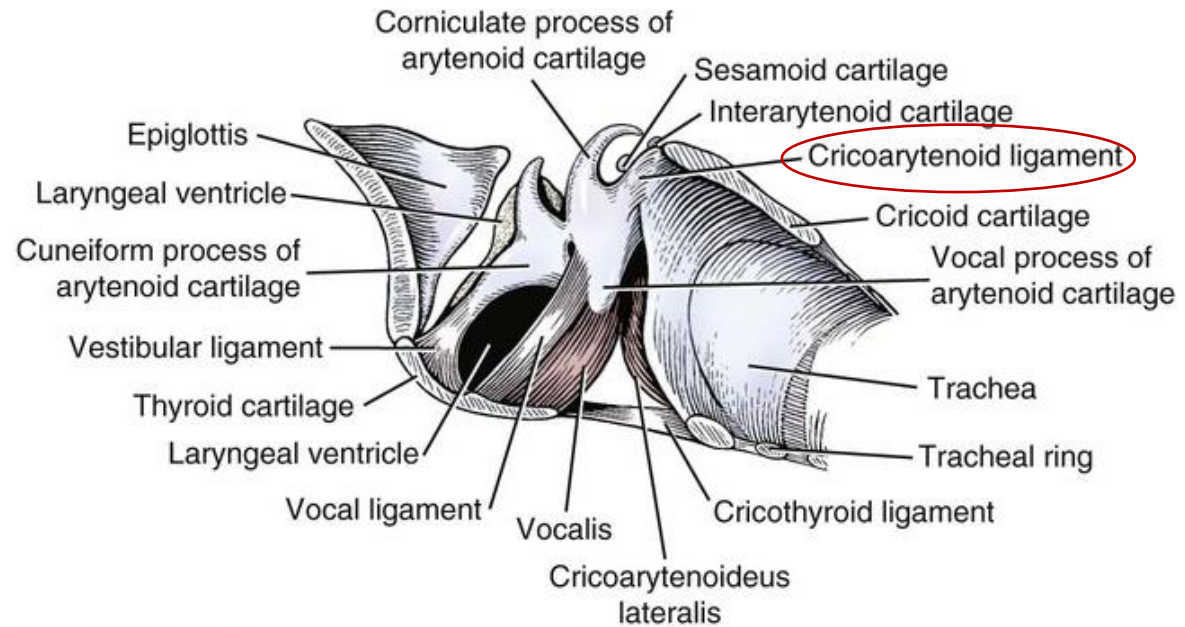
FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostradorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostradorsal view with the dorsal aspect of the oesophagus removed.



KEHLKOPFBÄNDER

RINGKNORPEL- STELLKNORPELVERBINDUNG:

LIGAMENTUM CRICOARYTENOIDEUM



KEHLKOPFBÄNDER

VERBINDUNG DER BEIDEN STELLKNORPEL:

LIGAMENTUM ARYTENOIDEUM TRANSVERSUM

- zwischen kaudalen Winkel dieser Knorpel

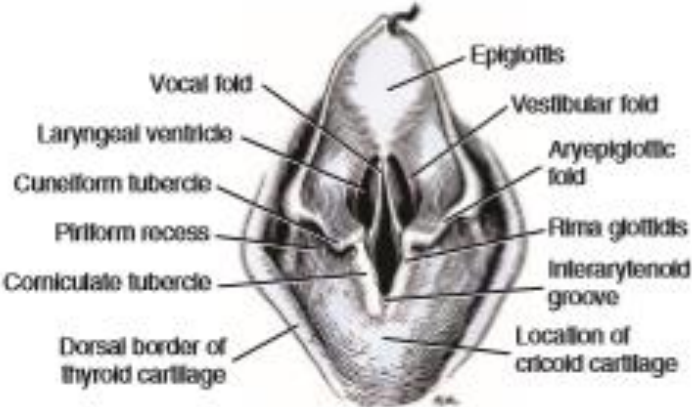
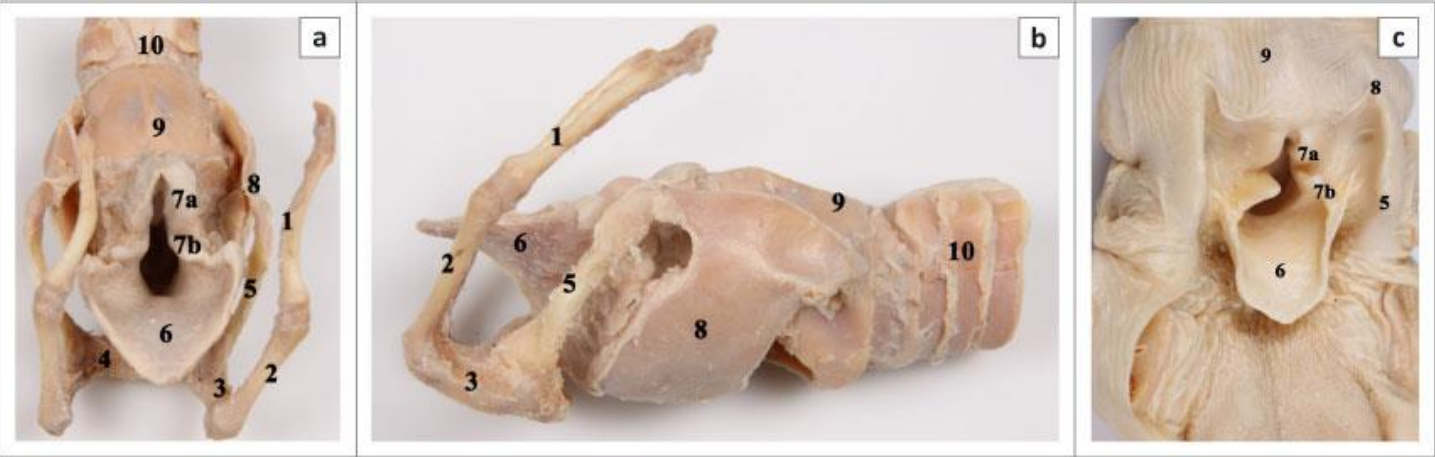


FIGURE 8-15 Dorsal aspect of larynx, showing vocal and vestibular folds.



Source: Photographs by M. Doom
Evident in these views are the, (1) stylohyoid, (2) epihyoid, (3) ceratohyoid, (4) basihyoid (5) thyrohyoid, (6) epiglottis, (7a) corniculate process of the arytenoid cartilage, (7b) cuneiform process of the arytenoid cartilage, (8) thyroid cartilage, (9) cricoid cartilage and (10) trachea.

FIGURE 1: Embalmed cadaver specimen of a canine larynx, depicted as, (a) rostradorsal view with the muscles removed, (b) lateral view after removal of the muscles and (c) rostradorsal view with the dorsal aspect of the oesophagus removed.

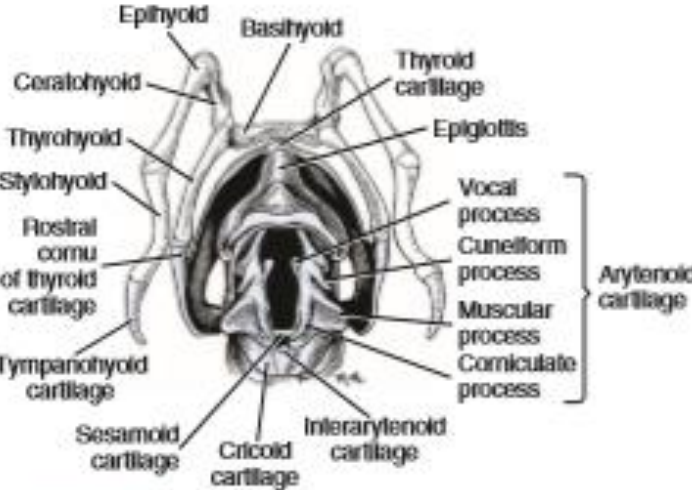
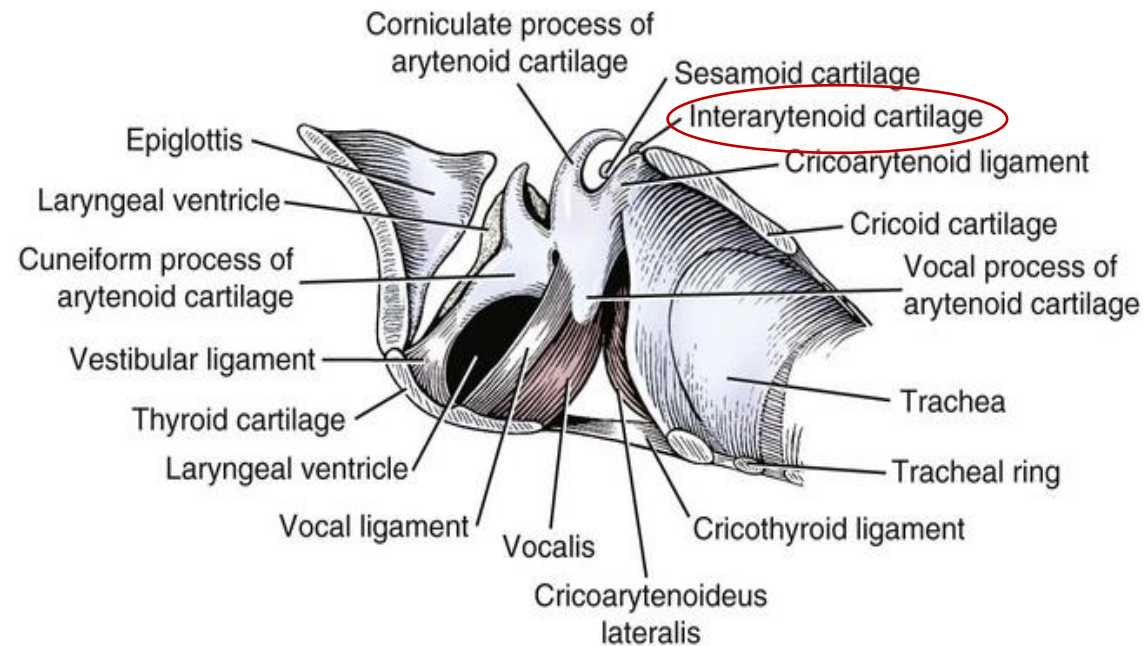


FIGURE 8-16 Laryngeal cartilages and hyoid apparatus, dorsal aspect.

KEHLKOPFBÄNDER

VERBINDUNG DER BEIDEN STELLKNORPEL:

- **CARTILAGO INTERARYTENOIDEUM:**
- **Zwischenknorpel – zwischen beiden Aryknorpel eingefügt**
- **beim Hd, Schw.**



KEHLKOPFBÄNDER

RINGKNORPEL- SCHILDKNORPELVERBINDUNG:

MEMBRANA FIBROELATICA LARYNGIS:

- Schleimhaut der Kehlkopfhöhle
- am Stimmband anheftet sich

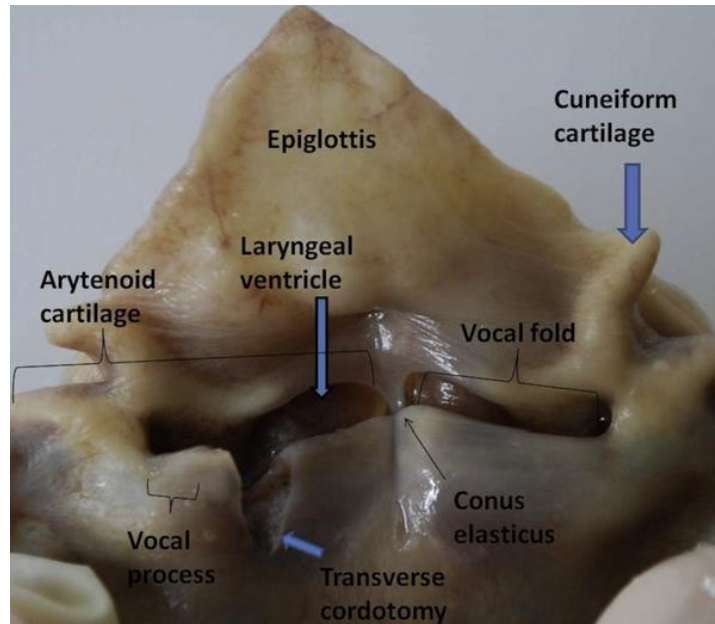
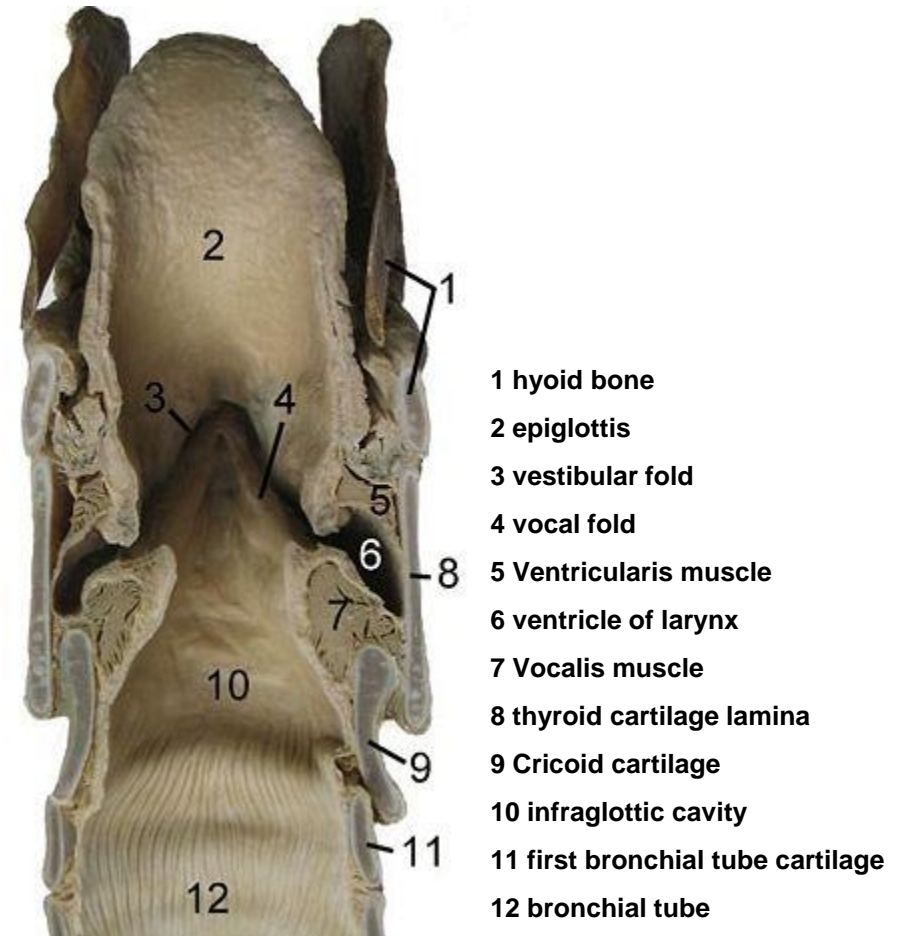


Fig. 1. Autopic laryngeal specimen from an autopsy from a normal dog, dorsal aspect. The regional anatomy and the site of the cordotomy have been highlighted on the specimen.

<https://www.sciencedirect.com/science/article/pii/S0034528810000299>



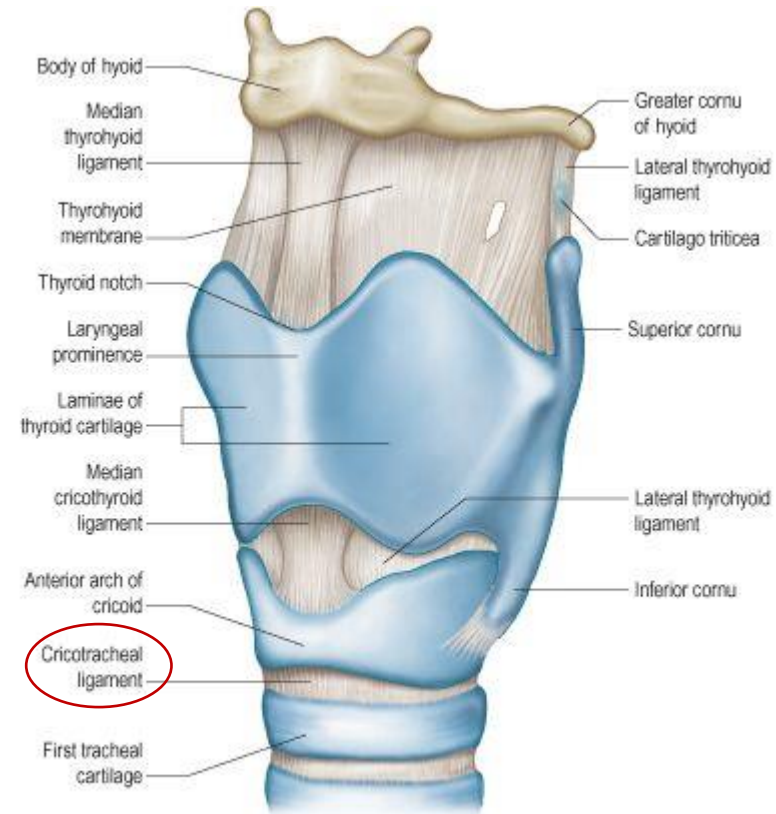
Cut through the larynx of a horse

https://en.wikipedia.org/wiki/Infraglottic_cavity

KEHLKOPFBÄNDER

RINGKORPEL- LUFTRÖHRENVERBINDUNG:

- **Ligamentum cricotracheale**
- **zwischen Ringknorpel und erster Luftröhrenspange**



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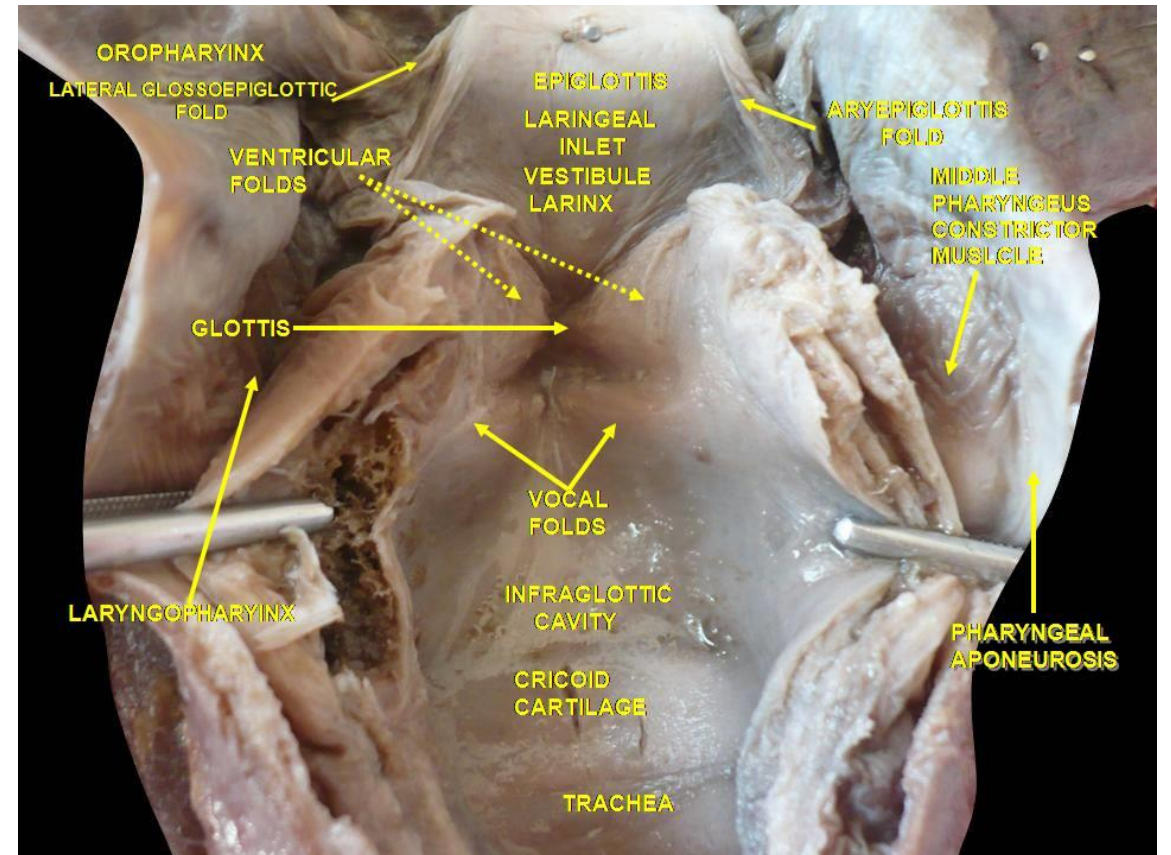
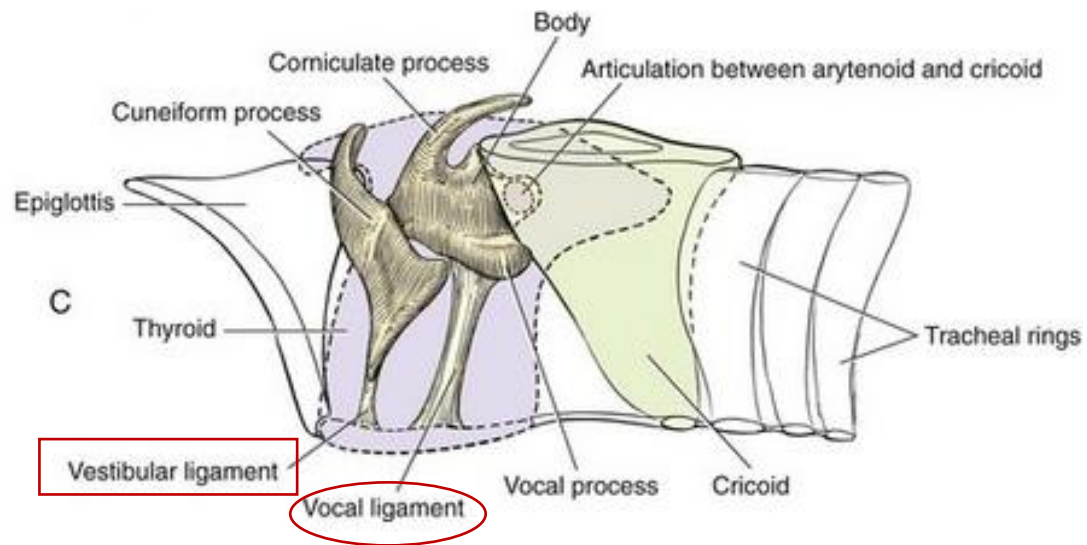
<http://www.rock-cafe.info/suggest/laryngeal-prominence-location-6c6172796e6765616c.html>

KEHLKOPFBÄNDER

STELLKNORPELBÄNDER:

1. LIGAMENTUM VESTIBULARE

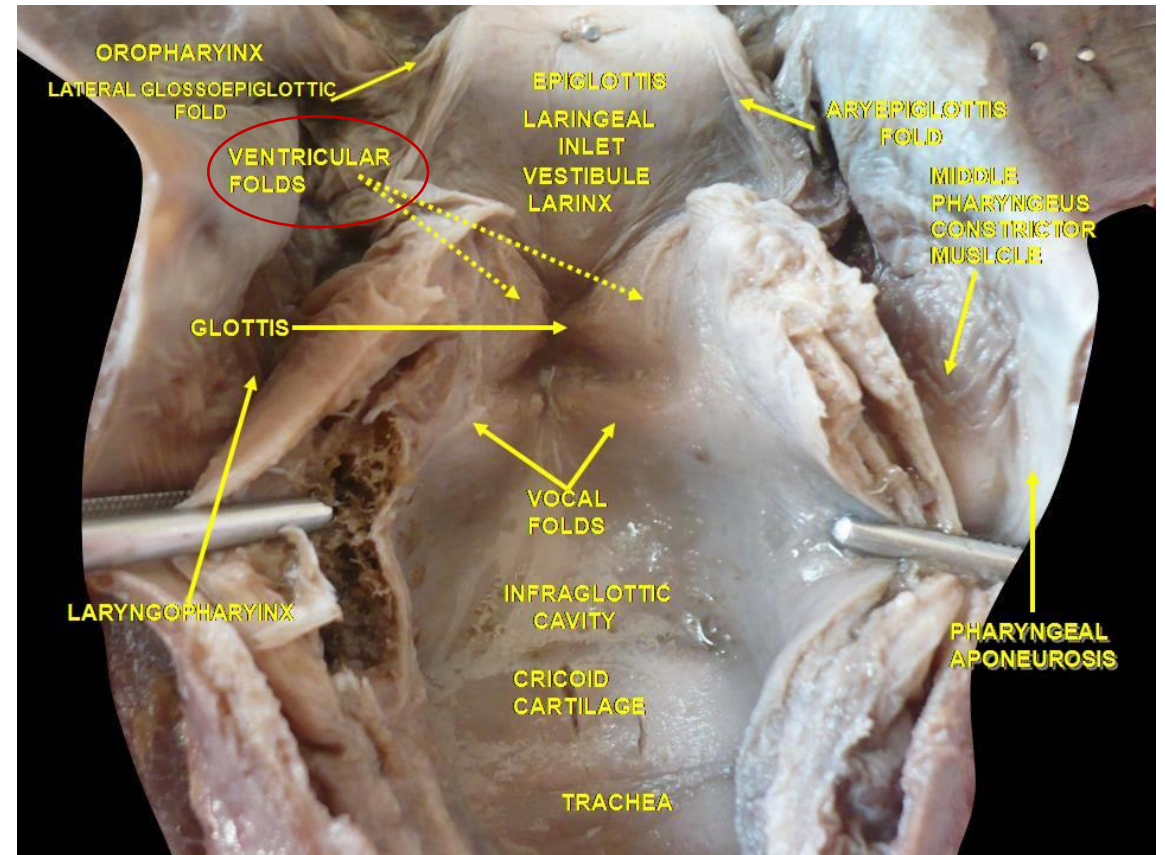
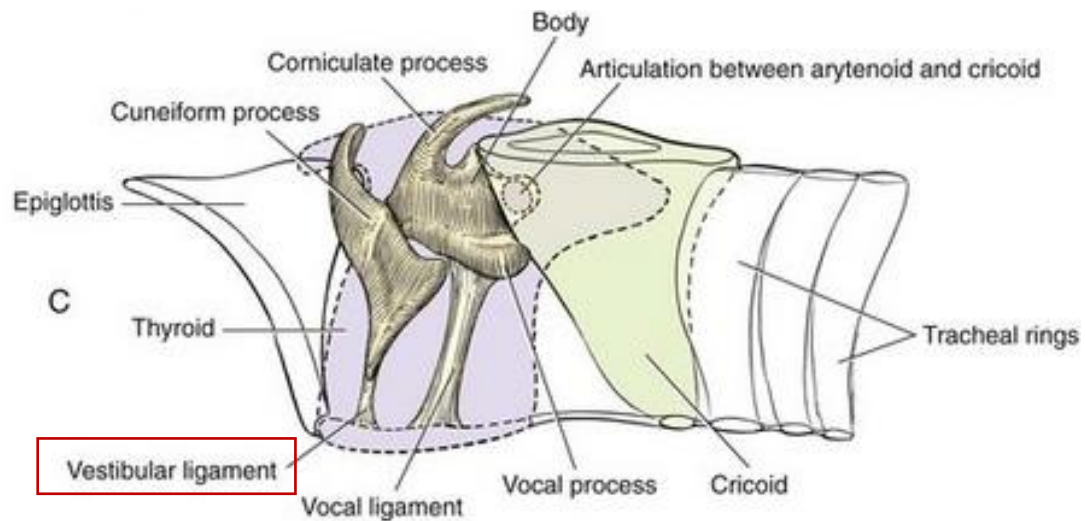
2. LIGAMENTUM VOCALE



KEHLKOPFBÄNDER

LIGAMENTUM VESTIBULARE

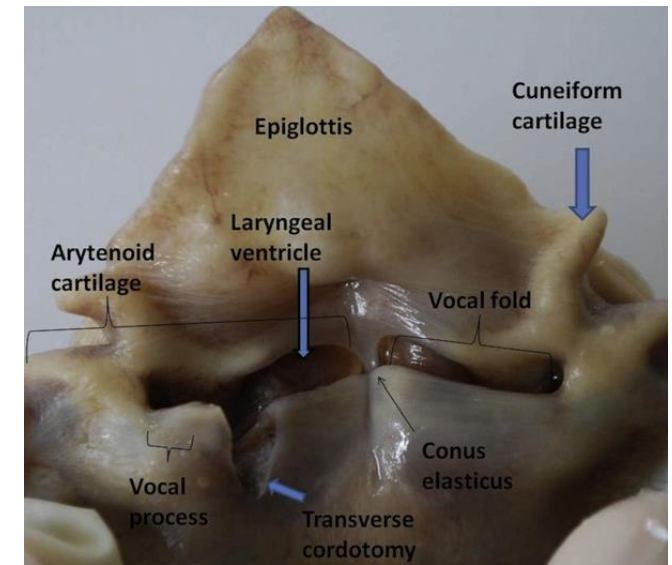
- rostral
- Vorhofband
- bei der Katze – fehlt
- bildet die Grundlage der falschen Stimmfalte (Plica vestibularis)



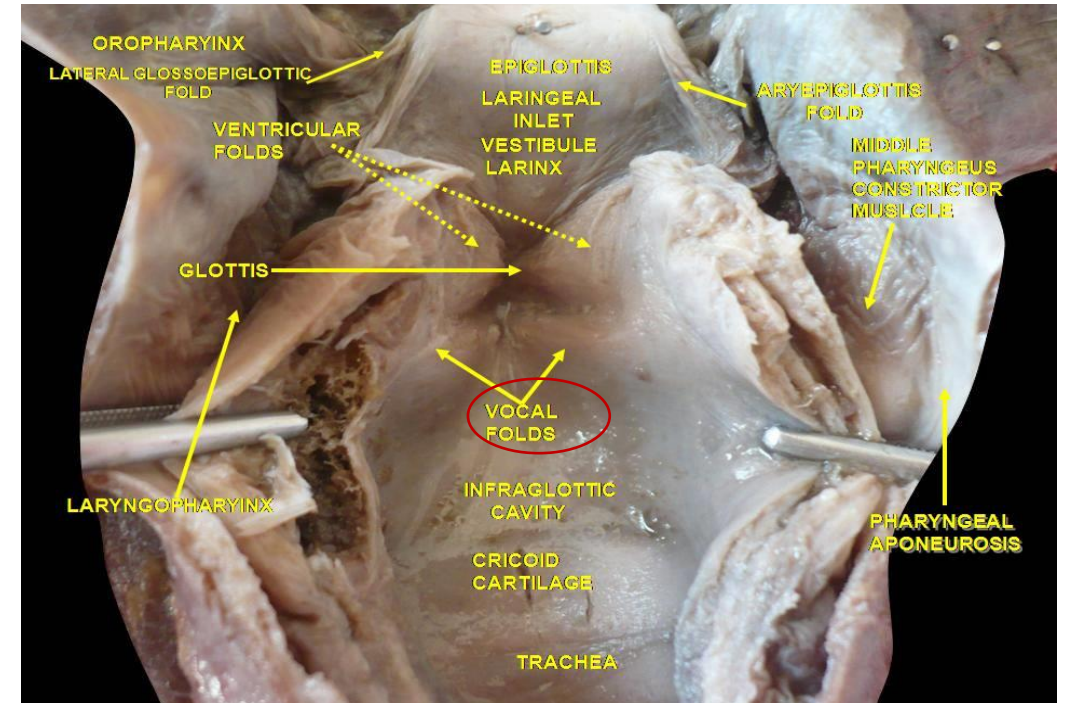
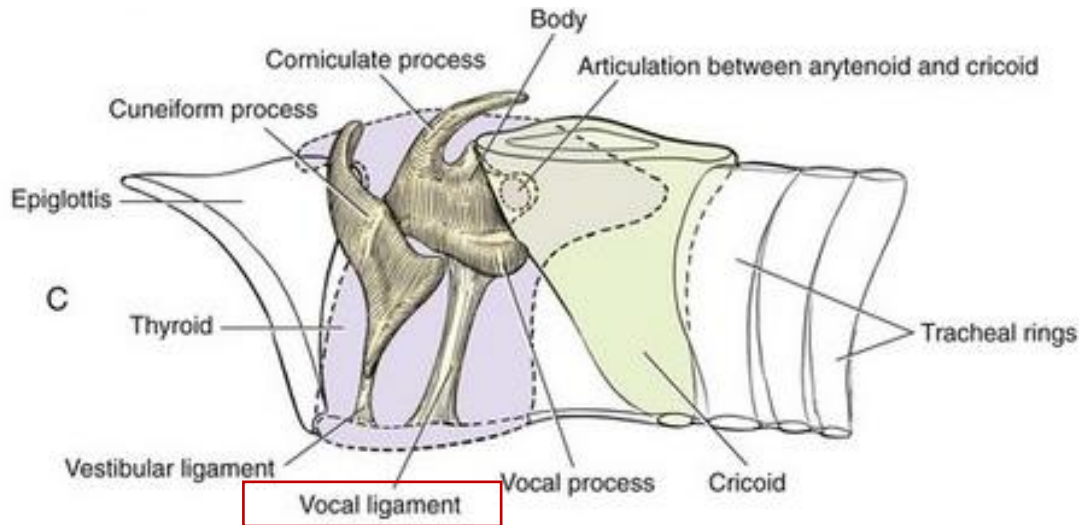
KEHLKOPFBÄNDER

LIGAMENTUM VOCALE

- kaudal
- Stimmband
- zwischen Proc. vocalis des Stellknorpels und dem Körper des Schildknorpels
- bildet die Grundlage der Stimmfalte (Plica vocalis)



<https://www.sciencedirect.com/science/article/pii/S0034528810000299>



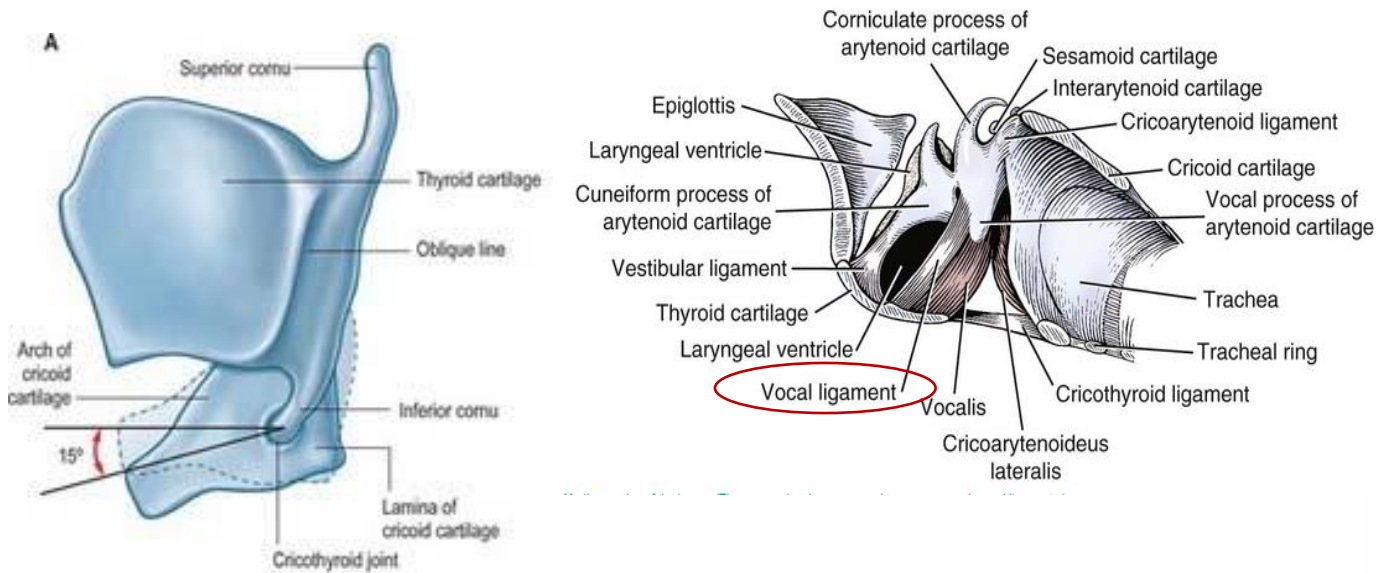
http://www.wikiwand.com/en/Laryngeal_vestibule

GELENKE DES KEHLKOPFS

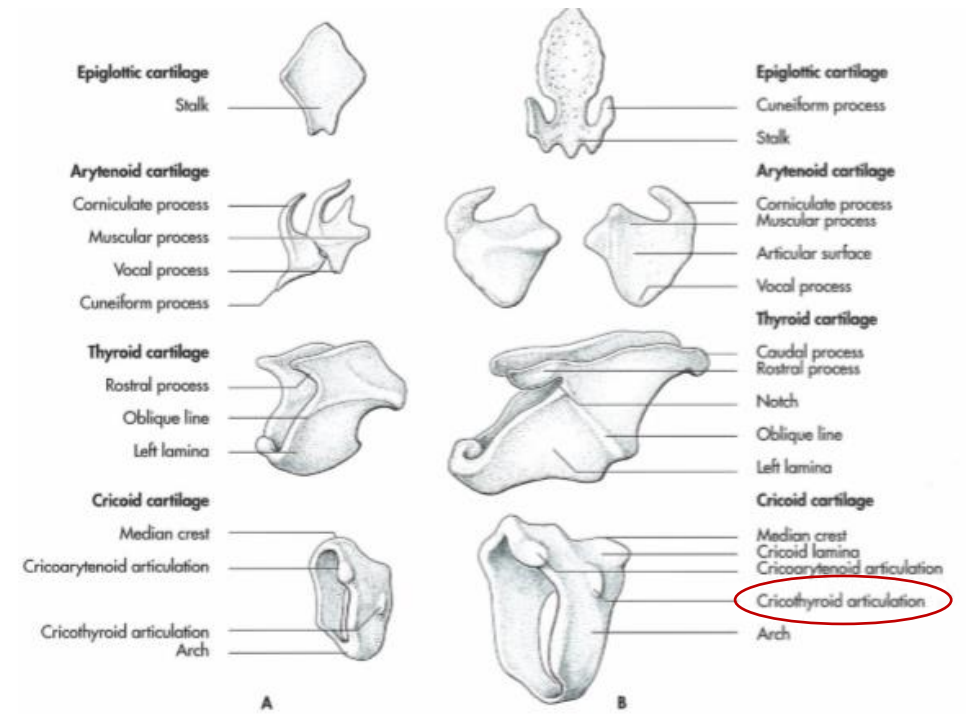
GELENKIGE RINGKNORPEL- SCHILDKNORPELVERBINDUNG:

ARTICULATIO CRICOTHYROIDEA:

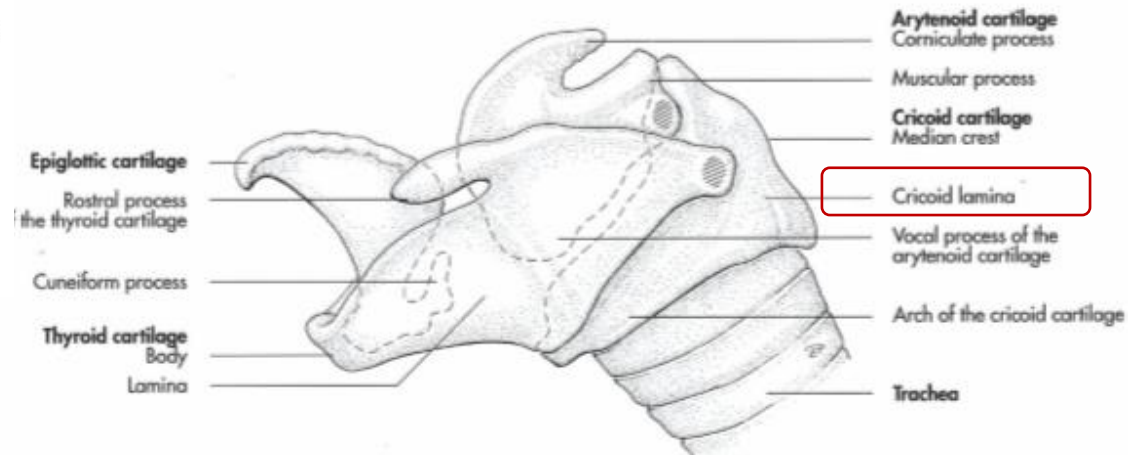
- Ausnahme: Wdk. – eine Syndesmose besteht
- zwischen Lamina cartilaginis cricoideae und Cornu caudale des Schildknorpels
- bei Knippbewegung ändern sich die Spannung und Länge der Stimmbänder



<https://clinicalgate.com/larynx/>



Laryngeal cartilages of the dog (A) and the horse (B), schematic.

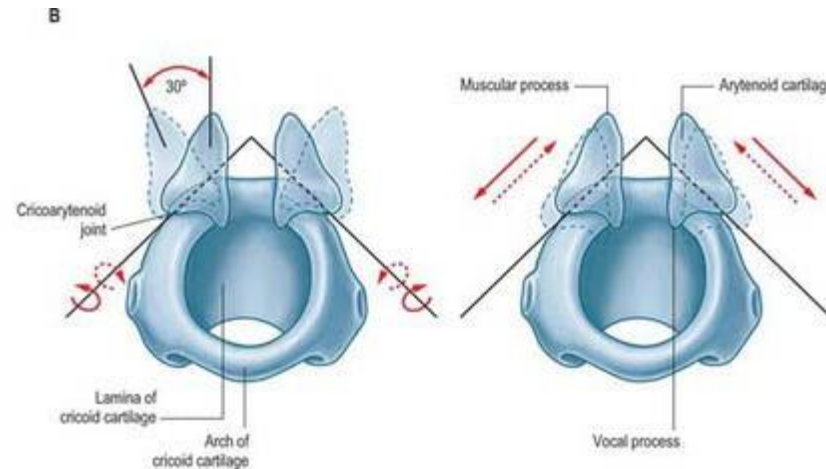
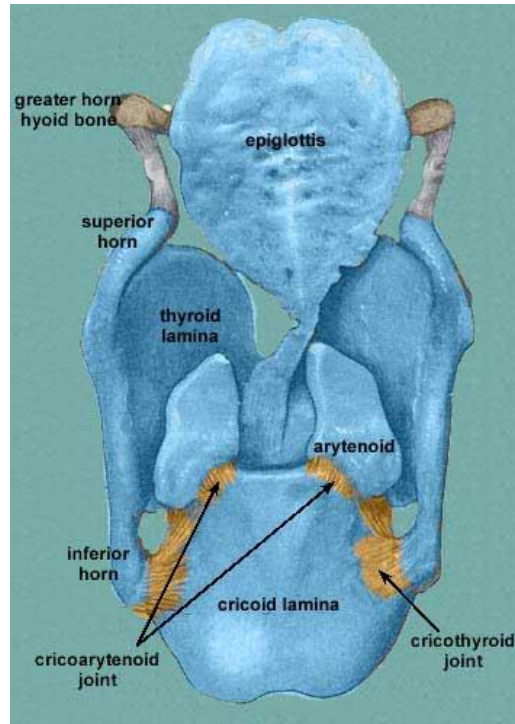


GELENKE DES KEHLKOPFS

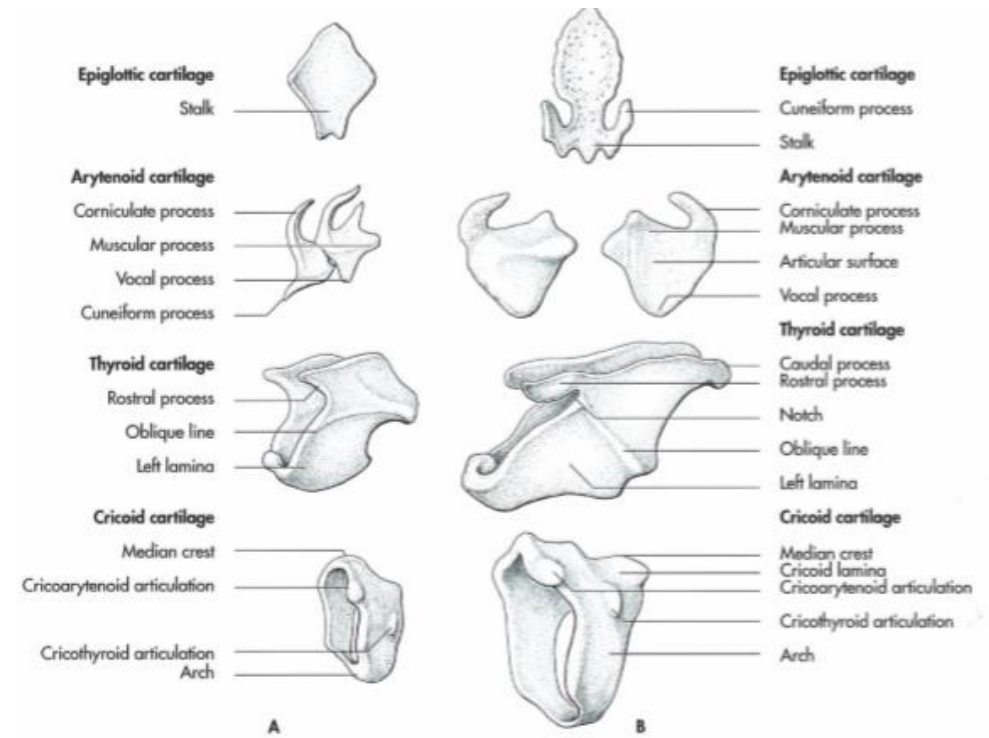
RINGKORPEL- STELLKORPELVERBINDUNG:

ARTICULATIO CRICOARYTENOIDEA:

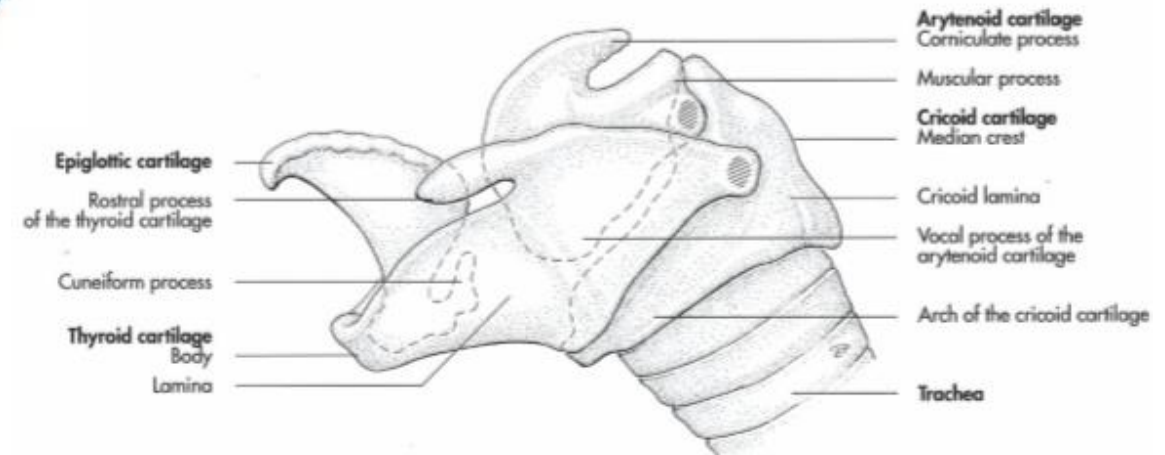
1. dorsoventrale Knippbewegungen um die Walzenachse
2. Gleitbewegungen parallel zur Walzenachse
3. Drehbewegungen um die Höhenachse des Stellknorpels



<https://clinicalgate.com/larynx/>



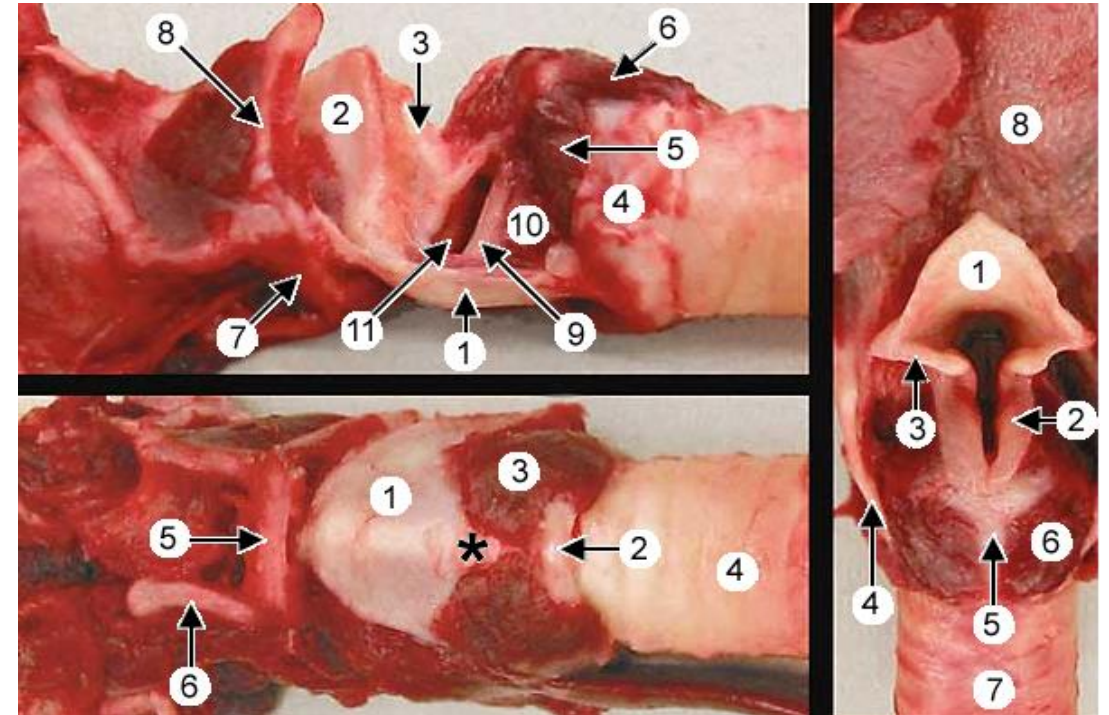
Laryngeal cartilages of the dog (A) and the horse (B), schematic.



KEHLKOPFMUSKELN

gibt es Muskeln die:

1. von außen herantreten um den Kehlkopf als ganzes zu bewegen
2. zwischen den Knorpelteilen verlaufen
3. an Kehlkopf entspringen um den Pharynx zu verengen (Schlundkopfschnürer)



Three views of the larynx (fresh tissue). *Right:* epiglottic cartilage (1), arytenoid cartilages (2), aryepiglottic fold (3), thyroid cartilage (4), cricoid cartilage (5), cricoarytenoideus dorsalis m. (6), trachea (7), and root of the tongue (8).

Left top: The left side of the larynx has been removed. Identify: thyroid cartilage (1), epiglottic cartilage (2), arytenoid cartilage (3), cricoid cartilage (4), cricoarytenoideus lateralis m. (5), cricoarytenoideus dorsalis m. (6), basihyoid bone (7), and thyrohyoid bone (8). Notice the vocal ligament (9) and vocalis m. (10) of the vocal fold (covering mucosa removed). The laryngeal ventricle (11) is just rostral to the vocal fold.

Left bottom: thyroid cartilage (1), cricoid cartilage (2), cricothyroid ligament (asterisk), cricothyroideus m. (3), trachea (4), basihyoid bone (5), and ceratohyoid bone (6).

KEHLKOPFMUSKELN

gibt es Muskeln die:

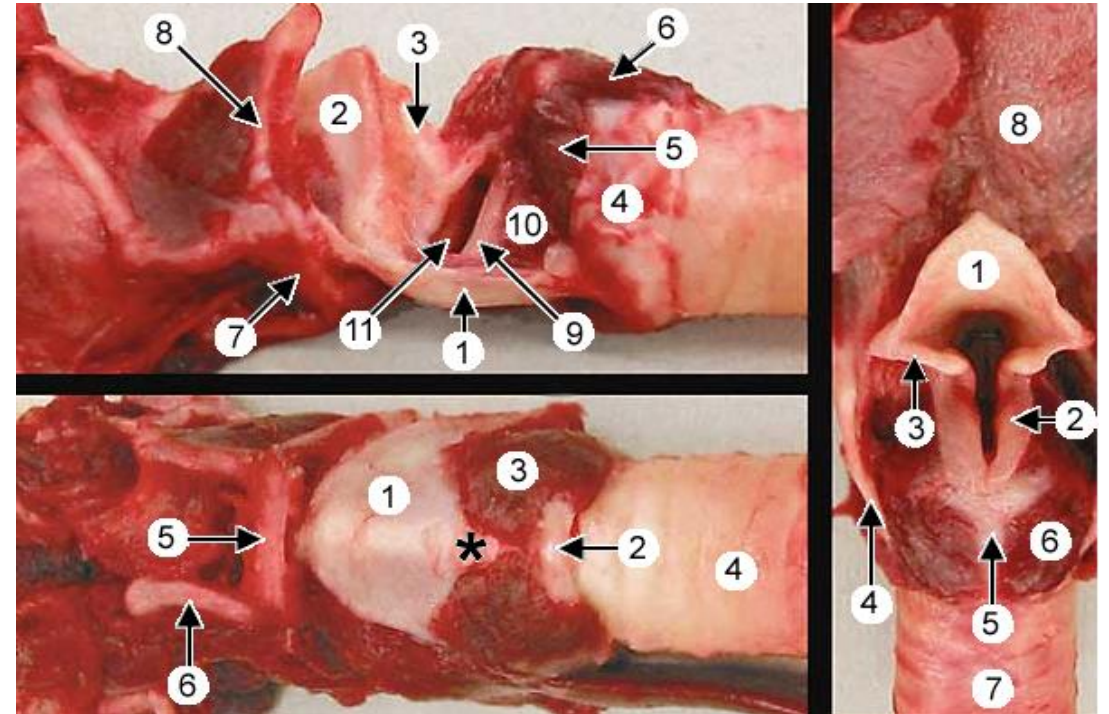
- 1. von außen herantreten um den Kehlkopf als ganzes zu bewegen:**
 - **die Zungenbeinmuskeln**
 - **ziehen den Kehlkopf nach vorne**

KEHLKOPFMUSKELN

gibt es Muskeln die:

2. zwischen den Knorpelteilen verlaufen

- eigentliche Kehlkopfmuskeln
- Erweiterung und Verengung der Kehlkopfenge
- Spannung und Entspannung der Stimmbänder



Three views of the larynx (fresh tissue). *Right:* **epiglottic cartilage** (1), arytenoid cartilages (2), aryepiglottic fold (3), **thyroid cartilage** (4), **cricoid cartilage** (5), cricoarytenoideus dorsalis m. (6), trachea (7), and root of the tongue (8).

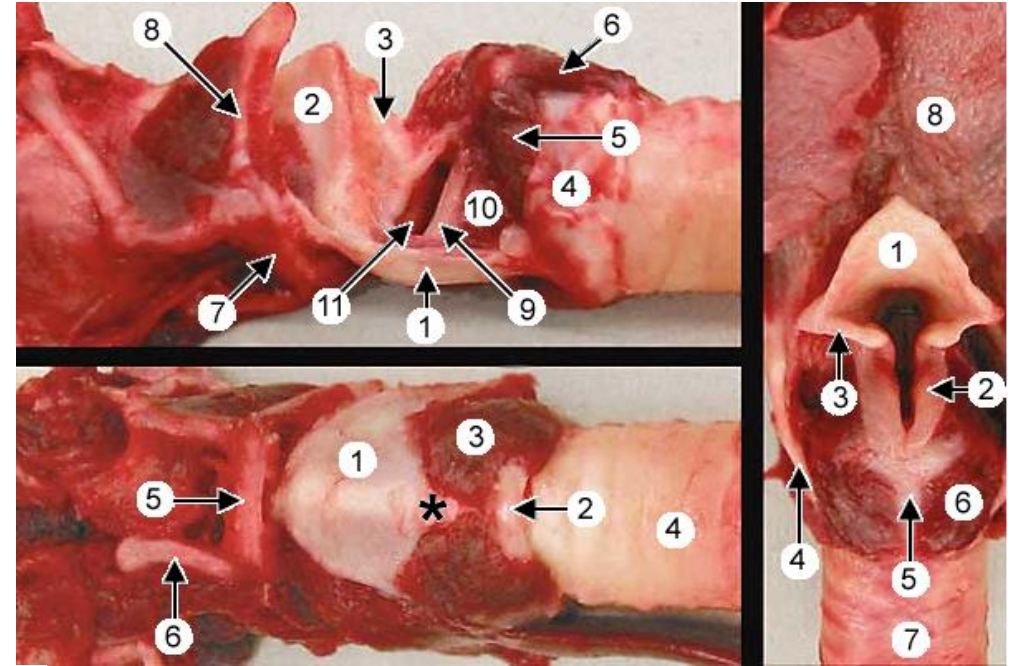
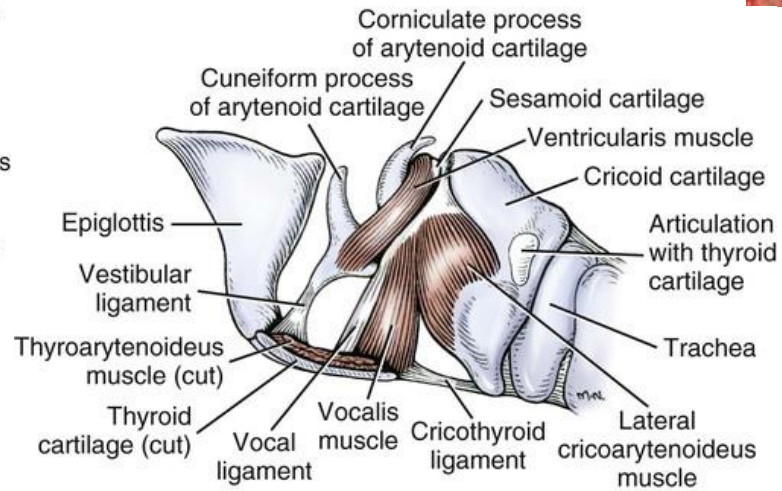
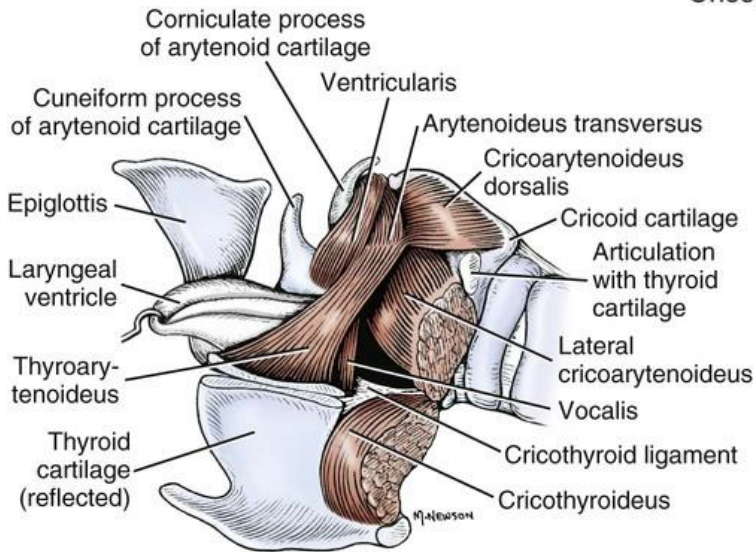
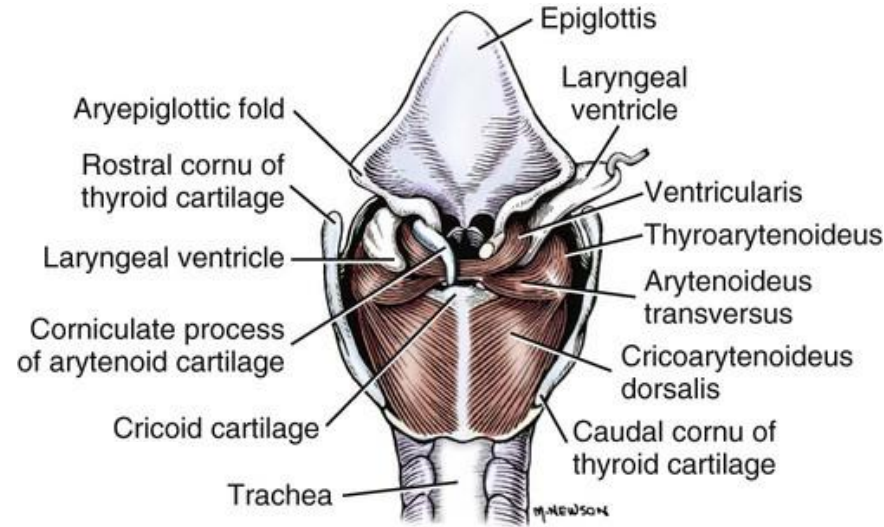
Left top: The left side of the larynx has been removed. Identify: **thyroid cartilage** (1), **epiglottic cartilage** (2), arytenoid cartilage (3), **cricoid cartilage** (4), cricoarytenoideus lateralis m. (5), cricoarytenoideus dorsalis m. (6), **basihyoid bone** (7), and thyrohyoid bone (8). Notice the **vocal ligament** (9) and **vocalis m.** (10) of the vocal fold (covering mucosa removed). The **laryngeal ventricle** (11) is just rostral to the vocal fold.

Left bottom: **thyroid cartilage** (1), **cricoid cartilage** (2), cricothyroid ligament (asterisk), cricothyroideus m. (3), trachea (4), **basihyoid bone** (5), and ceratohyoid bone (6).

KEHLKOPFMUSKELN

EIGENTLICHE KEHLKOPFMUSKELN:

1. **M. cricothyroideus**
2. **M. cricoarytenoideus dorsalis**
3. **M. cricoarytenoideus lateralis**
4. **M. arytenoideus transversus**
5. **M. thyroarytenoideus**



Three views of the larynx (fresh tissue). *Right:* epiglottic cartilage (1), arytenoid cartilages (2), aryepiglottic fold (3), thyroid cartilage (4), cricoid cartilage (5), cricoarytenoideus dorsalis m. (6), trachea (7), and root of the tongue (8).

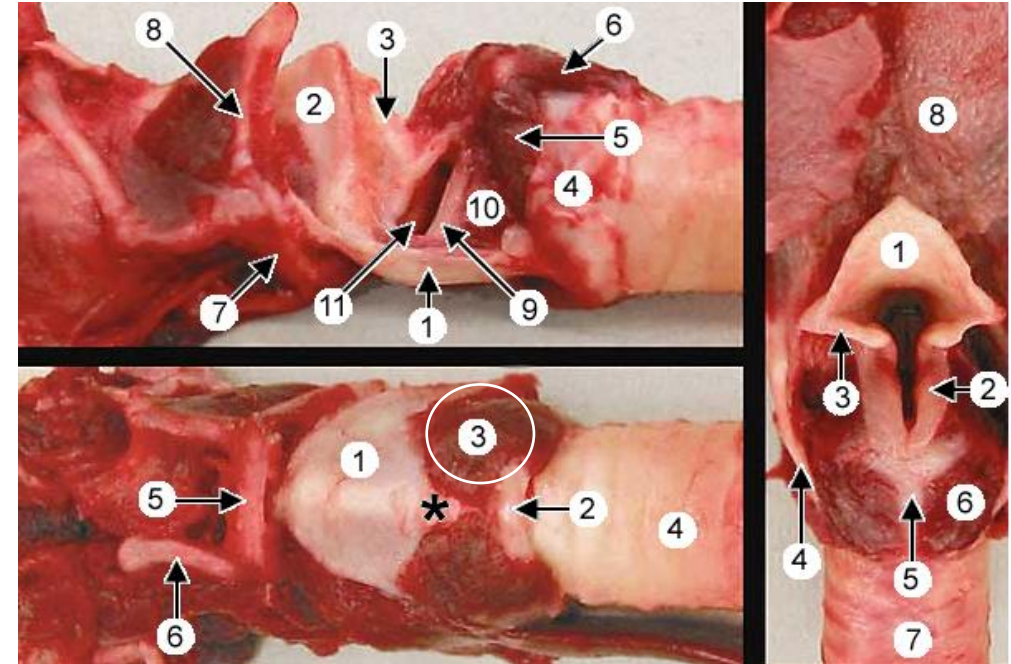
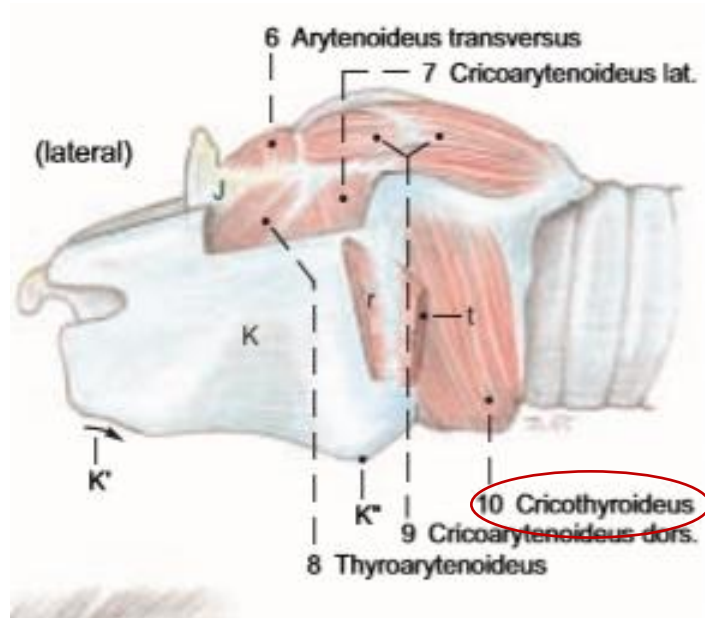
Left top: The left side of the larynx has been removed. Identify: thyroid cartilage (1), epiglottic cartilage (2), arytenoid cartilage (3), cricoid cartilage (4), cricoarytenoideus lateralis m. (5), cricoarytenoideus dorsalis m. (6), basihyoid bone (7), and thyrohyoid bone (8). Notice the vocal ligament (9) and vocalis m. (10) of the vocal fold (covering mucosa removed). The laryngeal ventricle (11) is just rostral to the vocal fold.

Left bottom: thyroid cartilage (1), cricoid cartilage (2), cricothyroid ligament (asterisk), cricothyroideus m. (3), trachea (4), basihyoid bone (5), and ceratohyoid bone (6).

KEHLKOPFMUSKELN

M. CRICOTHYROIDEUS:

- seitlich zwischen dem Schildknorpel und dem Reif des Ringknorpels
- **ventral liegt**
- Spannung der Stimmbänder
- **einzigster Kehlkopfmuskel wird vom N. laryngeus cranialis innerviert**



Three views of the larynx (fresh tissue). *Right:* epiglottic cartilage (1), arytenoid cartilages (2), aryepiglottic fold (3), thyroid cartilage (4), cricoid cartilage (5), cricoarytenoideus dorsalis m. (6), trachea (7), and root of the tongue (8).

Left top: The left side of the larynx has been removed. Identify: thyroid cartilage (1), epiglottic cartilage (2), arytenoid cartilage (3), cricoid cartilage (4), cricoarytenoideus lateralis m. (5), cricoarytenoideus dorsalis m. (6), basihyoid bone (7), and thyrohyoid bone (8). Notice the vocal ligament (9) and vocalis m. (10) of the vocal fold (covering mucosa removed). The laryngeal ventricle (11) is just rostral to the vocal fold.

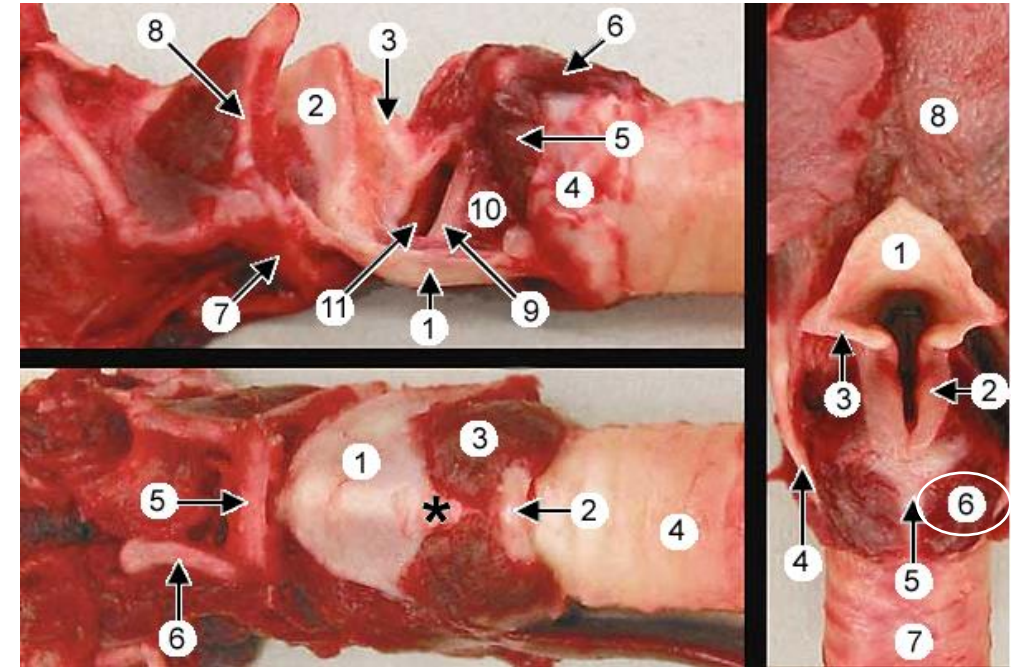
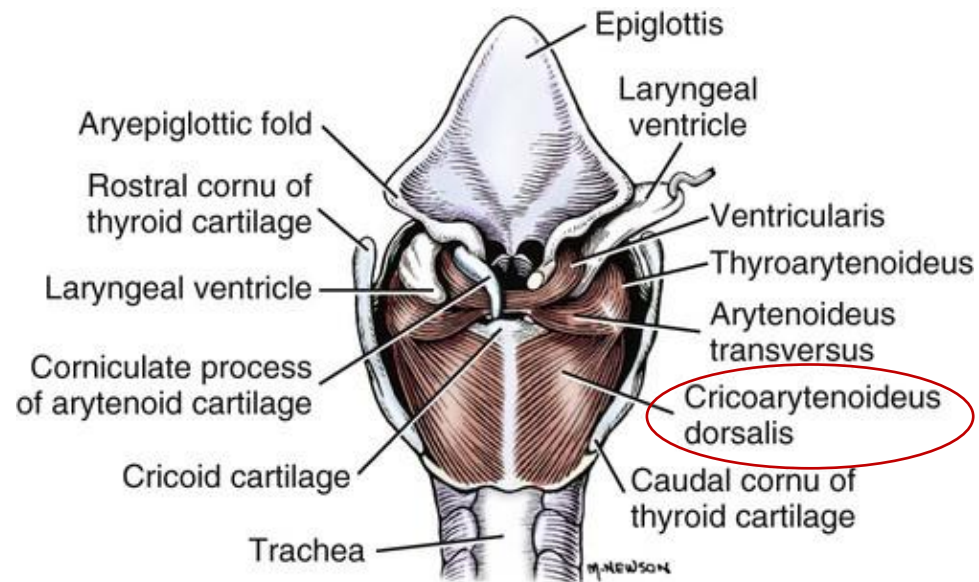
Left bottom: thyroid cartilage (1), cricoid cartilage (2), cricothyroid ligament (asterisk), cricothyroideus m. (3), trachea (4), basihyoid bone (5), and ceratohyoid bone (6).

<http://vanat.cvm.umn.edu/carnLabs/Lab23/lmg23-2.html>

KEHLKOPFMUSKELN

M. CRICOARYTENOIDEUS DORSALIS:

- **Ursprung:** Platte des Rindknorpels
- **Ansatz:** rostral am Porc. muscularis des Stellknorpels
- **Funktion:** Erweiterer der Stimmritze
- sein Ausfall führt zum Kehlkopfpfeifen
- **Innervation:** N. laryngeus caudalis bzw. recurrens



Three views of the larynx (fresh tissue). *Right:* epiglottic cartilage (1), arytenoid cartilages (2), aryepiglottic fold (3), thyroid cartilage (4), cricoid cartilage (5), cricoarytenoideus dorsalis m. (6), trachea (7), and root of the tongue (8).

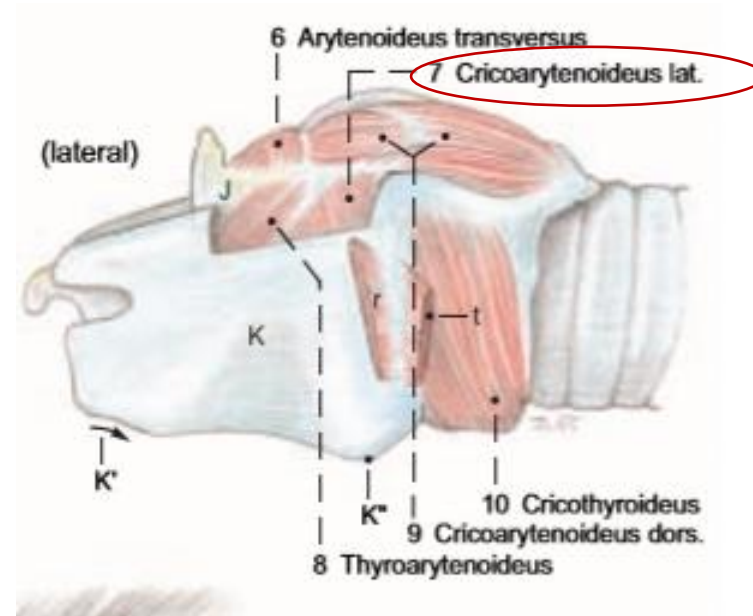
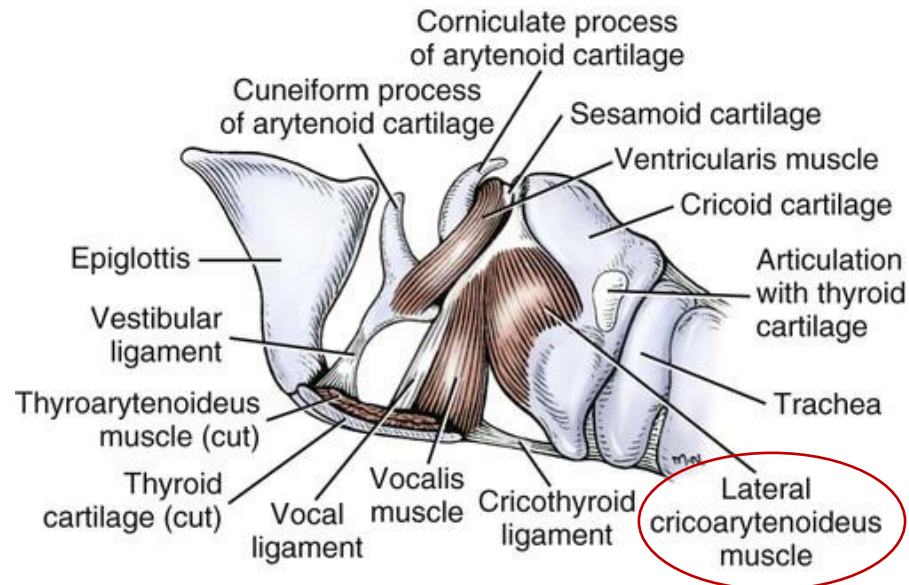
Left top: The left side of the larynx has been removed. Identify: thyroid cartilage (1), epiglottic cartilage (2), arytenoid cartilage (3), cricoid cartilage (4), cricoarytenoideus lateralis m. (5), cricoarytenoideus dorsalis m. (6), basihyoid bone (7), and thyrohyoid bone (8). Notice the vocal ligament (9) and vocalis m. (10) of the vocal fold (covering mucosa removed). The laryngeal ventricle (11) is just rostral to the vocal fold.

Left bottom: thyroid cartilage (1), cricoid cartilage (2), cricothyroid ligament (asterisk), cricothyroideus m. (3), trachea (4), basihyoid bone (5), and ceratohyoid bone (6).

KEHLKOPFMUSKELN

M. CRICOARYTENOIDEUS LATERALIS:

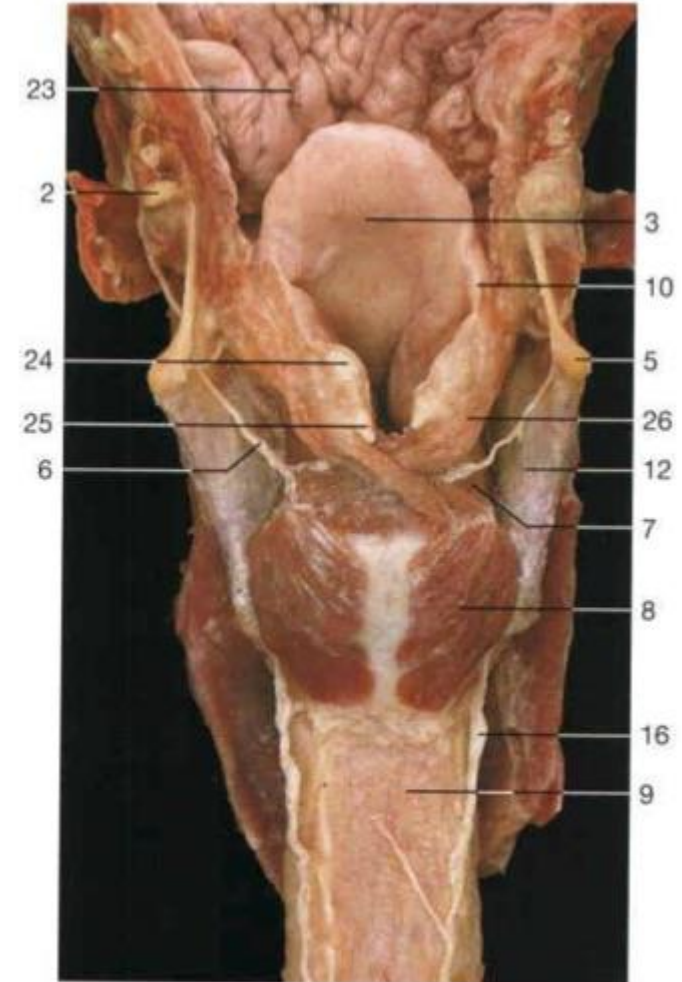
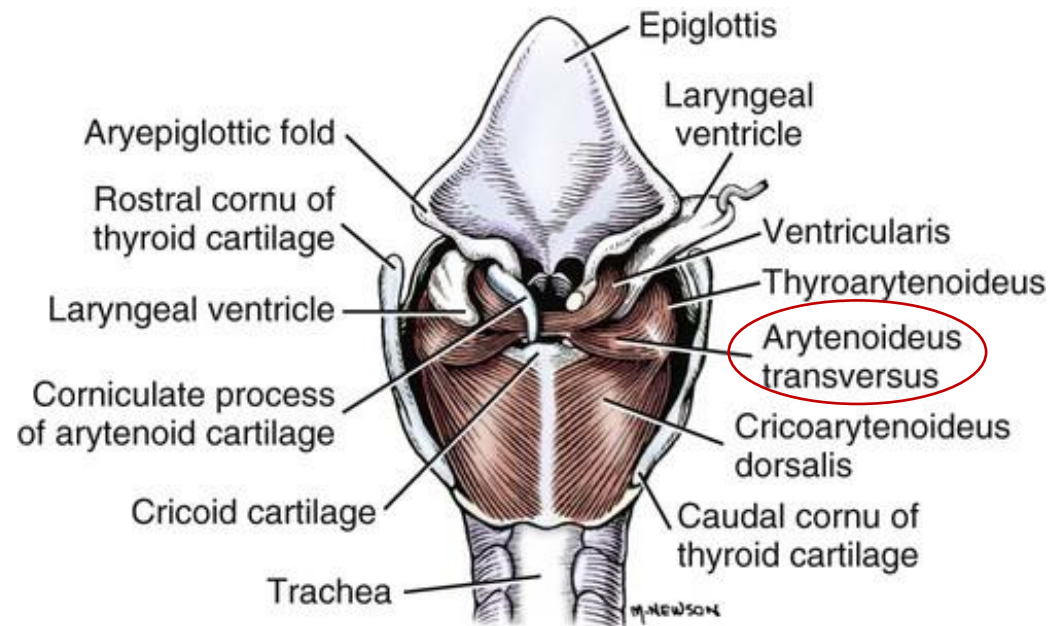
- **Ursprung:** Reifen des Rindknorpels
- **Ansatz:** Porc. muscularis des Stellknorpels
- **Funktion:** Verengung der Stimmritze
- **Innervation:** N. laryngeus caudalis bzw. recurrens



KEHLKOPFMUSKELN

M. ARYTENOIDEUS TRANSVERSUS:

- **Ursprung:** Proc. muscularis des Stellknorpels
- **Ansatz:** Proc. muscularis des Stellknorpels
- **Funktion:** Verengung der Stimmritze
- **Innervation:** N. laryngeus caudalis bzw. recurrens



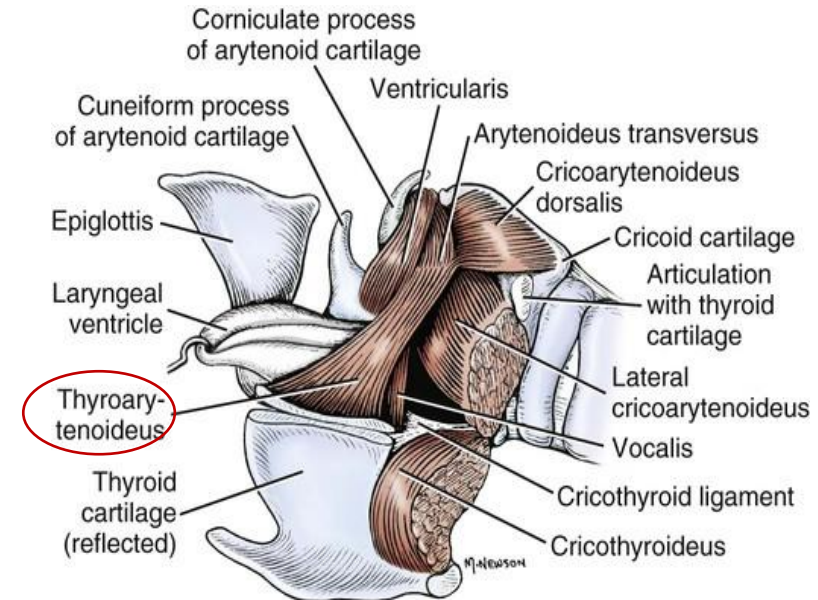
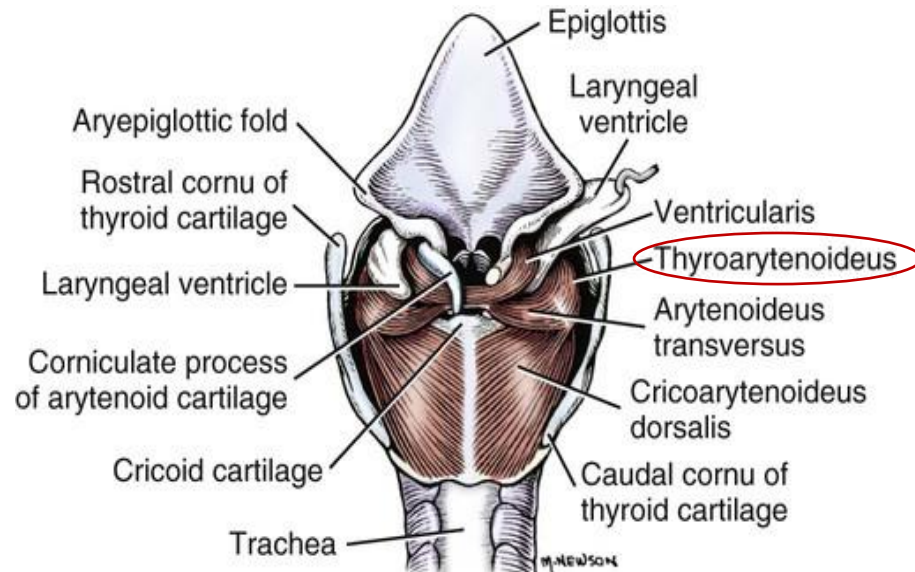
Laryngeal muscles and larynx
(posterior aspect).

7. M. arythaenoideus transversus

KEHLKOPFMUSKELN

M. THYROARYTENOIDEUS:

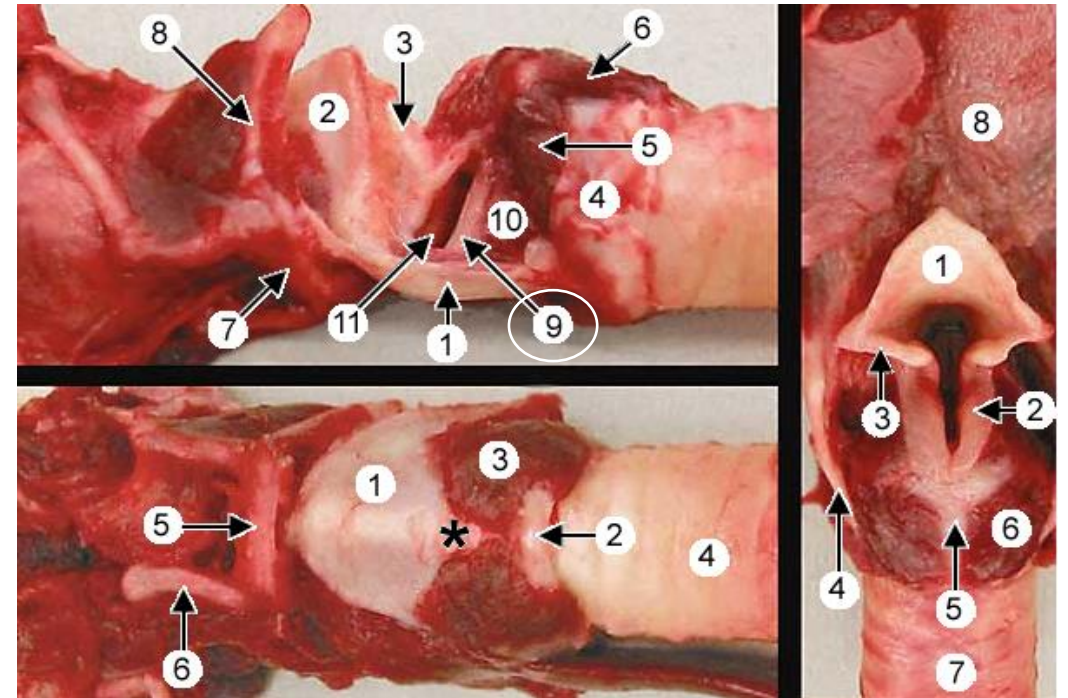
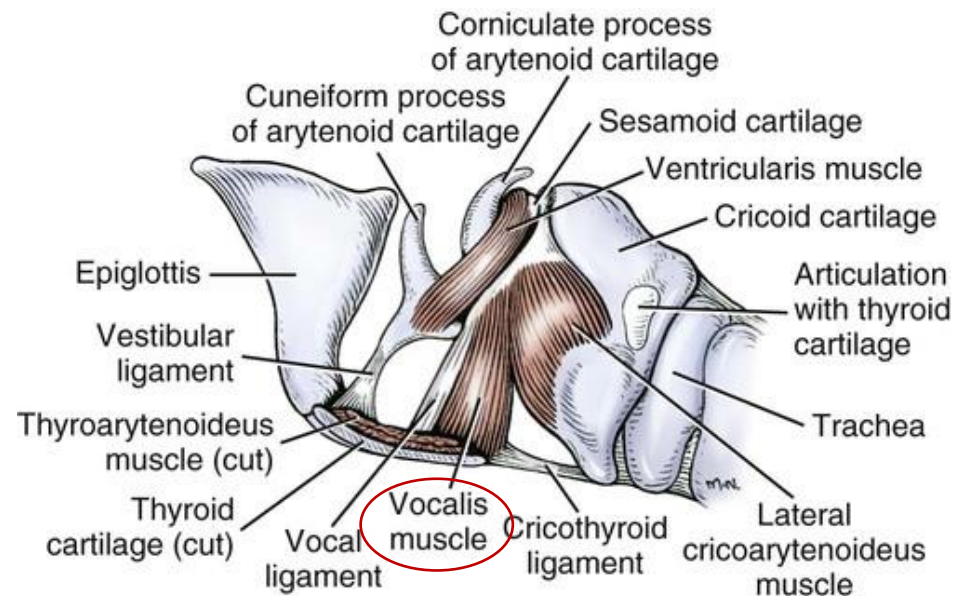
- **Ursprung:** Basis des Epiglottis und Schildknorpels
- **Ansatz:** Proc. muscularis und Proc. vocalis des Stellknorpels
- **beim Hund, Pferd – in den M. ventricularis und den M. vocalis gegliedert**
- **Innervation:** N. laryngeus caudalis bzw. recurrens



KEHLKOPFMUSKELN

M. VOCALIS:

- verläuft entsprechend in der Plica vocalis
- erhöht die Spannung der Stimmbänder
- Verengung der Stimmritze
- N. laryngeus caudalis bzw. recurrens innerviert



Three views of the larynx (fresh tissue). *Right:* epiglottic cartilage (1), arytenoid cartilages (2), aryepiglottic fold (3), thyroid cartilage (4), cricoid cartilage (5), cricoarytenoideus dorsalis m. (6), trachea (7), and root of the tongue (8).

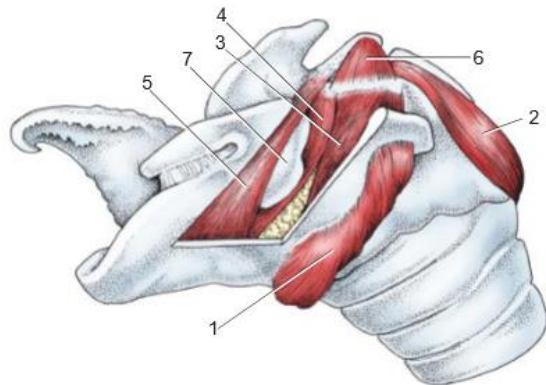
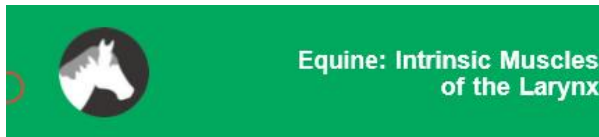
Left top: The left side of the larynx has been removed. Identify: thyroid cartilage (1), epiglottic cartilage (2), arytenoid cartilage (3), cricoid cartilage (4), cricoarytenoideus lateralis m. (5), cricoarytenoideus dorsalis m. (6), basihyoid bone (7), and thyrohyoid bone (8). Notice the vocal ligament (9) and vocalis m. (10) of the vocal fold (covering mucosa removed). The laryngeal ventricle (11) is just rostral to the vocal fold.

Left bottom: thyroid cartilage (1), cricoid cartilage (2), cricothyroid ligament (asterisk), cricothyroideus m. (3), trachea (4), basihyoid bone (5), and ceratohyoid bone (6).

KEHLKOPFMUSKELN

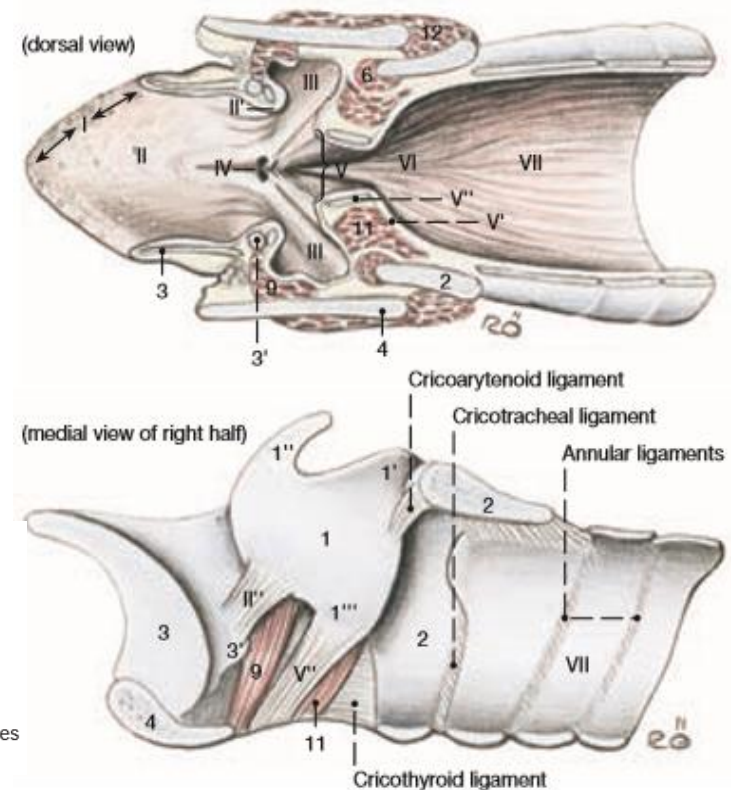
M. VENTRICULARIS:

- verläuft entsprechend in der Plica vestibularis
- erhöht die Spannung des Stimmbandes
- Verengung der Stimmritze
- N. laryngeus caudalis bzw. Recurrens innerviert



1. Cricothyroideus
2. Cricoarytenoideus dorsalis
3. Cricoarytenoideus lateralis
4. Vocalis
5. Ventricularis (4 + 5 = thyroarytenoideus)
6. Arytenoideus transversus
7. Laryngeal ventricle

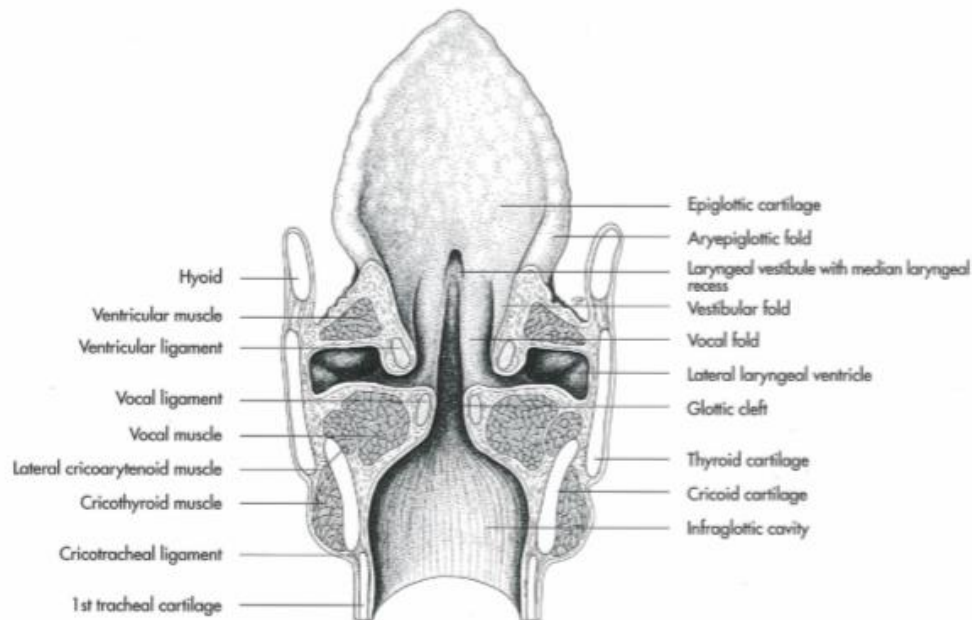
Note: Caudal (recurrent) laryngeal branch of the vagus nerve supplies 2, 3, 4, 5, and 6.



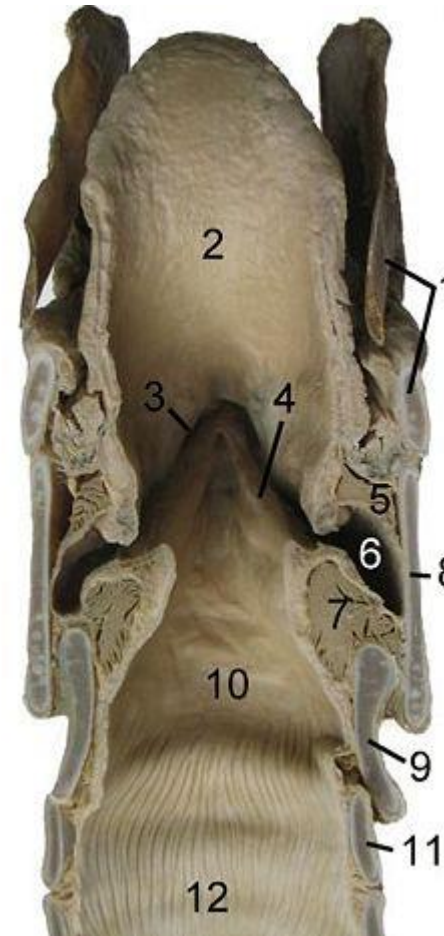
9. M. ventricularis
V''' Lig. Vocale
11. M. vocalis
Eq

KEHLKOPFHÖHLE (CAVUM LARYNGIS)

1. EINGANG DER KEHLKOPFHÖHLE (ADITUS LARYNGIS)
2. VORHOF (VESTIBULUM LARYNGIS)
3. KEHLKOPFTASCHE (VENTRICULUS LARYNGIS)
4. STIMMRITZE (RIMA GLOTTIDIS)
5. CAVUM INFRAGLOTTICUM



Dorsal section of the larynx of the horse, schematic (Budras and Röck, 1994).



- 1 hyoid bone
- 2 epiglottis
- 3 vestibular fold
- 4 vocal fold
- 5 Ventricularis muscle
- 6 ventricle of larynx
- 7 Vocalis muscle
- 8 thyroid cartilage lamina
- 9 Cricoid cartilage
- 10 infraglottic cavity
- 11 first bronchial tube cartilage
- 12 bronchial tube

Cut through the larynx of a horse

https://en.wikipedia.org/wiki/Infraglottic_cavity

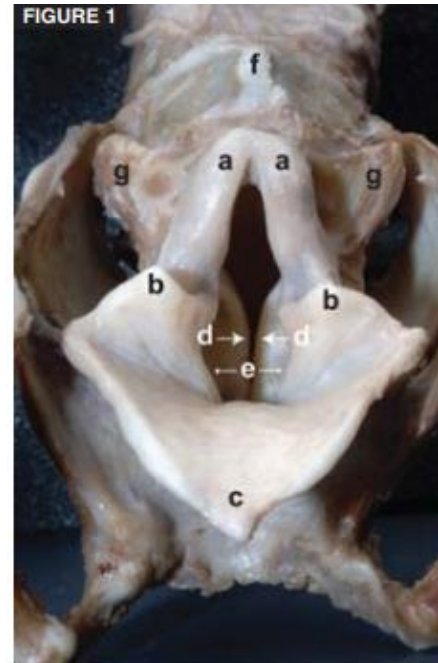
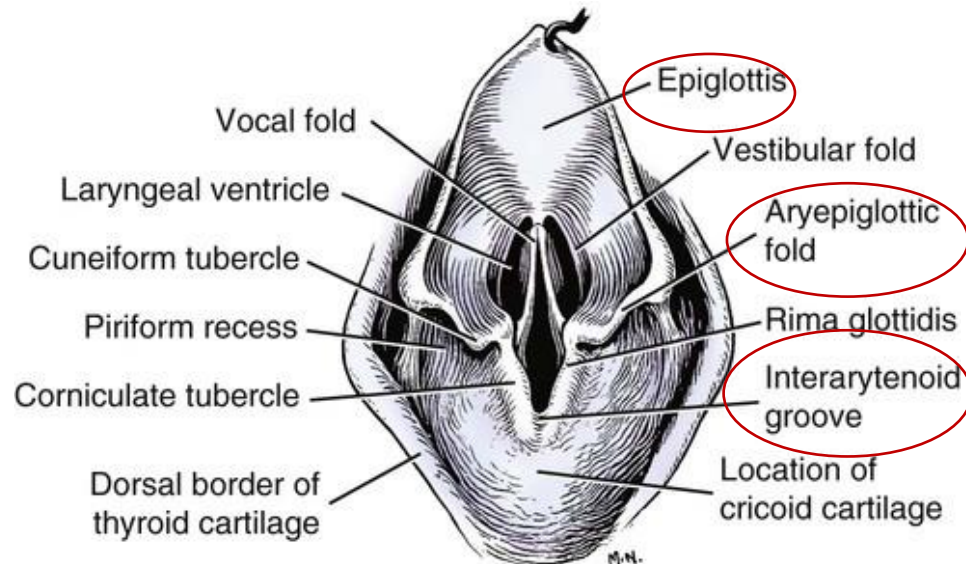
KEHLKOPFHÖHLE (CAVUM LARYNGIS)

EINGANG DER KEHLKOPFHÖHLE (ADITUS LARYNGIS):

- Kehlkopfkrone

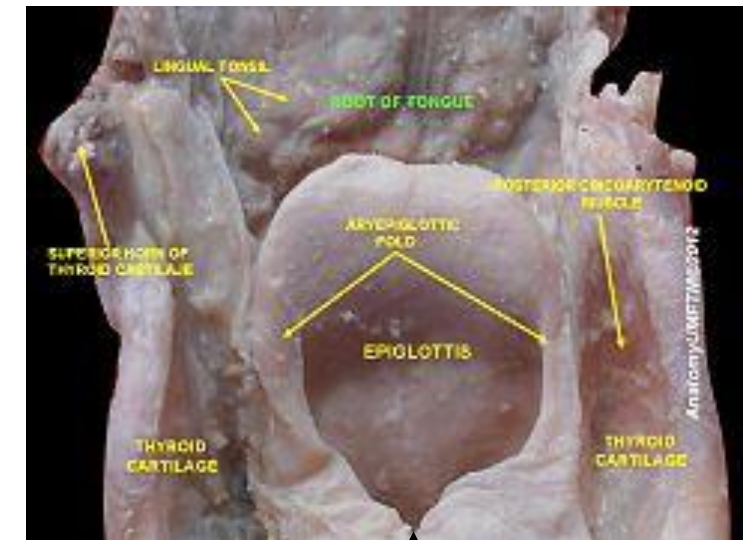
besteht aus:

- Epiglottis
- Plica aryepiglottica
- Cartilago arytenoidea
- Incisura interarytenoidale



Cranial view of a dissected canine larynx. (a) Comiculate process of arytenoid cartilage, (b) cuneiform process of arytenoid cartilage, (c) epiglottis, (d) vocal fold, (e) laryngeal ventricles, (f) cricoid cartilage, (g) muscular process of arytenoid cartilage.

<https://pdfs.semanticscholar.org/4d47/797134dc9b9c6da02501b417e7d76c4413cd.pdf>



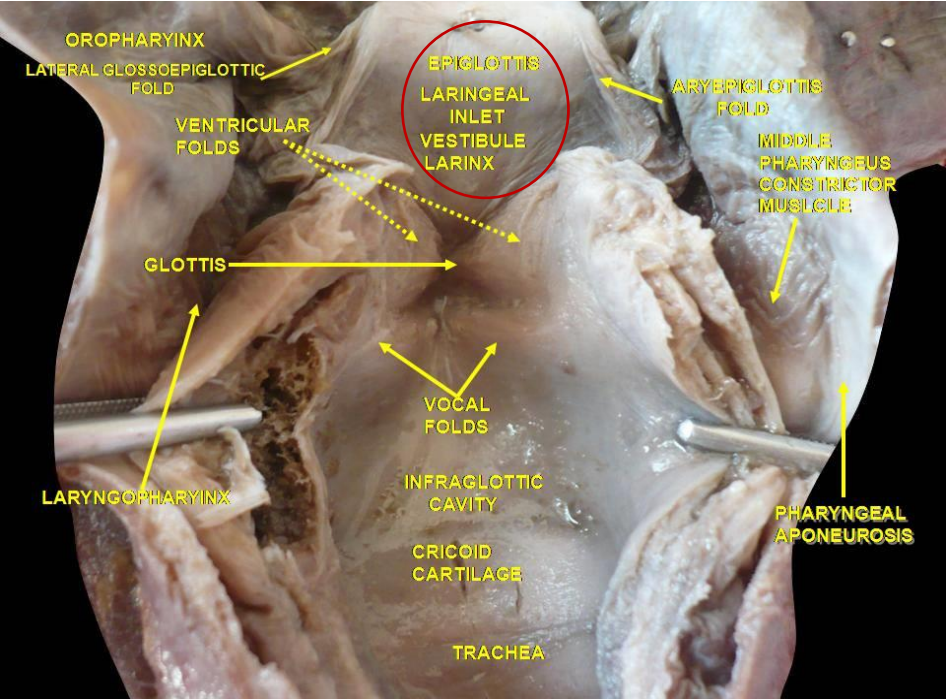
Incisura
interarytenoidale

http://www.wikiwand.com/en/Advanced_and_retracted_tongue_root

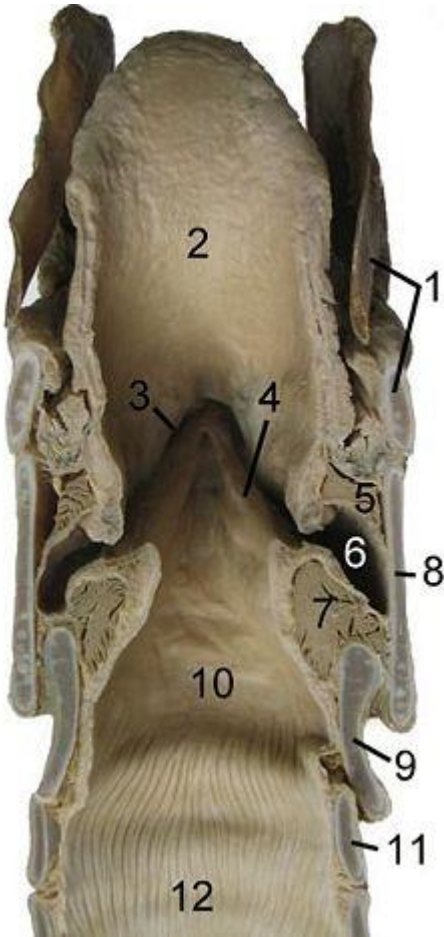
KEHLKOPFHÖHLE (CAVUM LARYNGIS)

VORHOF (VESTIBULUM LARYNGIS):

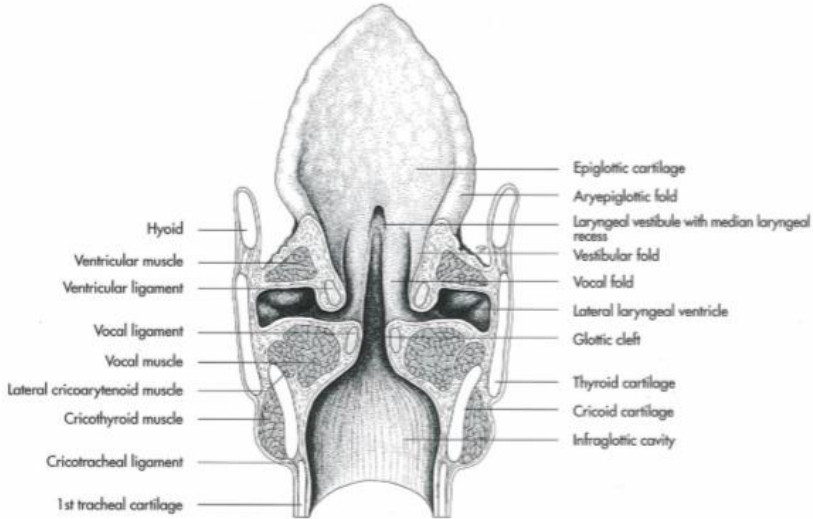
- beginnt mit dem Aditus laryngis
- Plica vestibularis



http://www.wikiwand.com/en/Laryngeal_vestibule



Cut through the larynx of a horse



- 1 hyoid bone
- 2 epiglottis
- 3 vestibular fold
- 4 vocal fold
- 5 Ventricularis muscle
- 6 ventricle of larynx
- 7 Vocalis muscle
- 8 thyroid cartilage lamina
- 9 Cricoid cartilage
- 10 infraglottic cavity
- 11 first bronchial tube cartilage
- 12 bronchial tube

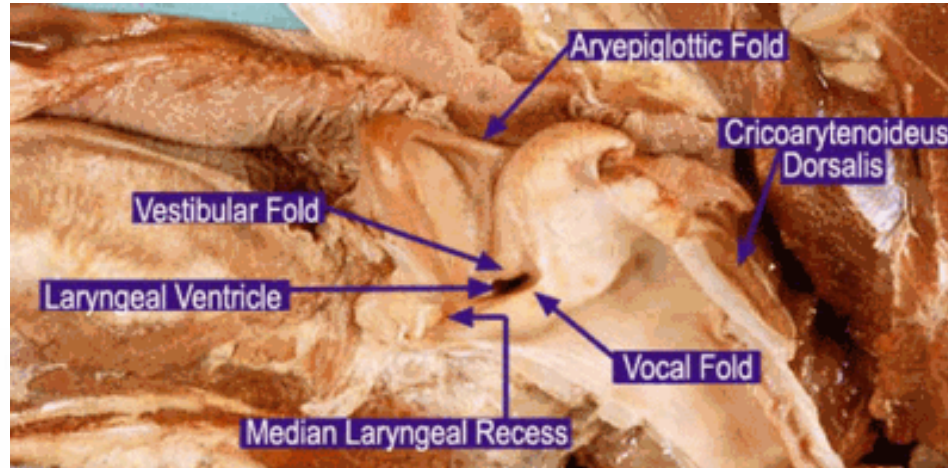
https://en.wikipedia.org/wiki/Infraglottic_cavity

KEHLKOPFHÖHLE (CAVUM LARYNGIS)

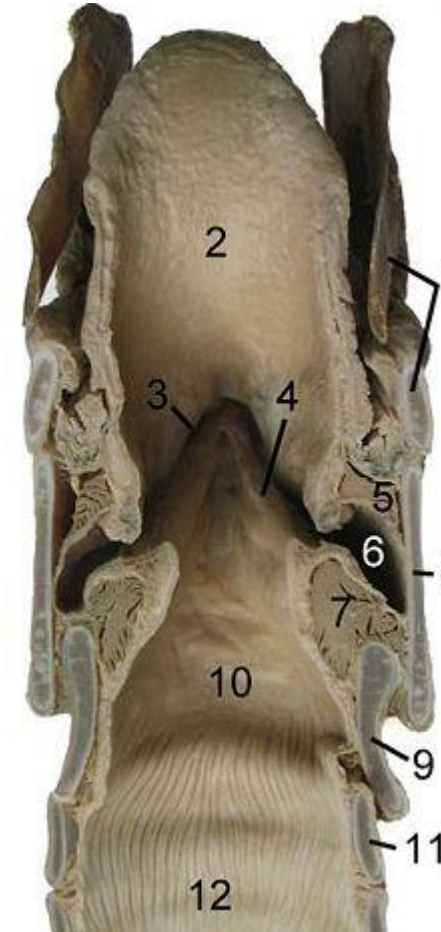
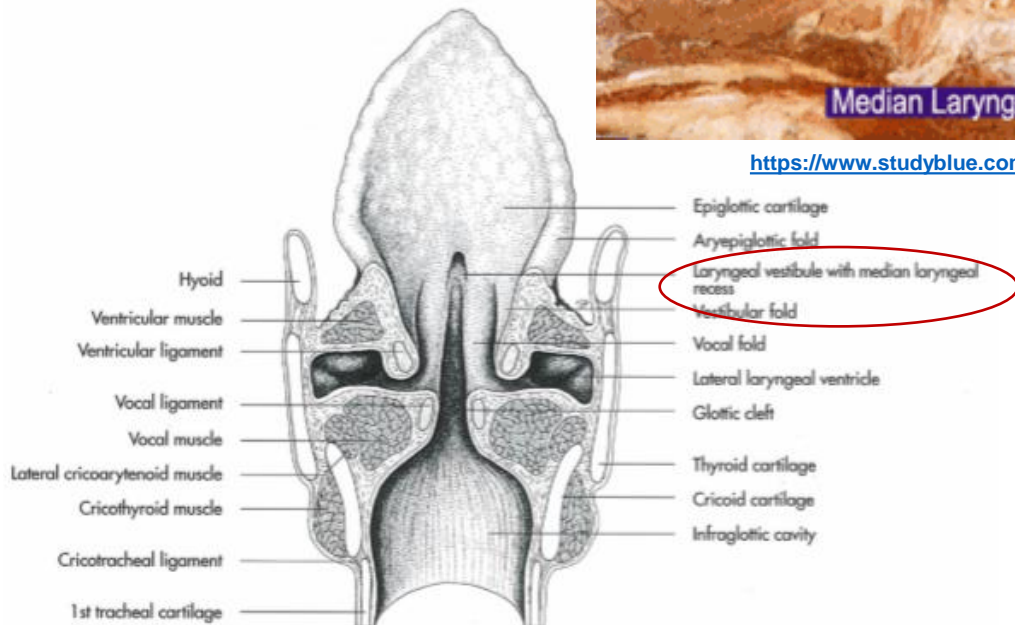
VORHOF (VESTIBULUM LARYNGIS):

RECESSUS LARYNGIS MEDIANUS:

- ventral im Vorhof die mittlere Kehlkopftasche
- beim Schw., Pfd.
- beim Flfr, Wdk. – fehlt



<https://www.studyblue.com/notes/n/horse-anatomy/deck/5406902>



- 1 hyoid bone
- 2 epiglottis
- 3 vestibular fold
- 4 vocal fold
- 5 Ventricularis muscle
- 6 ventricle of larynx
- 7 Vocalis muscle
- 8 thyroid cartilage lamina
- 9 Cricoid cartilage
- 10 infraglottic cavity
- 11 first bronchial tube cartilage
- 12 bronchial tube

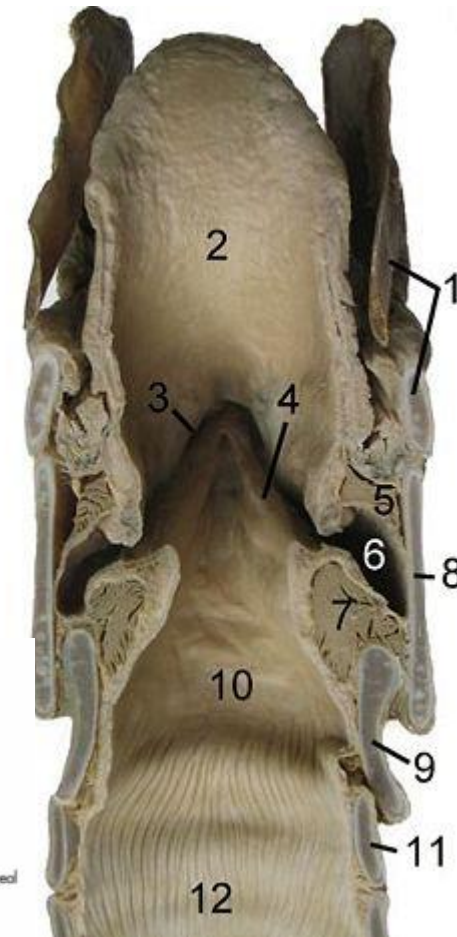
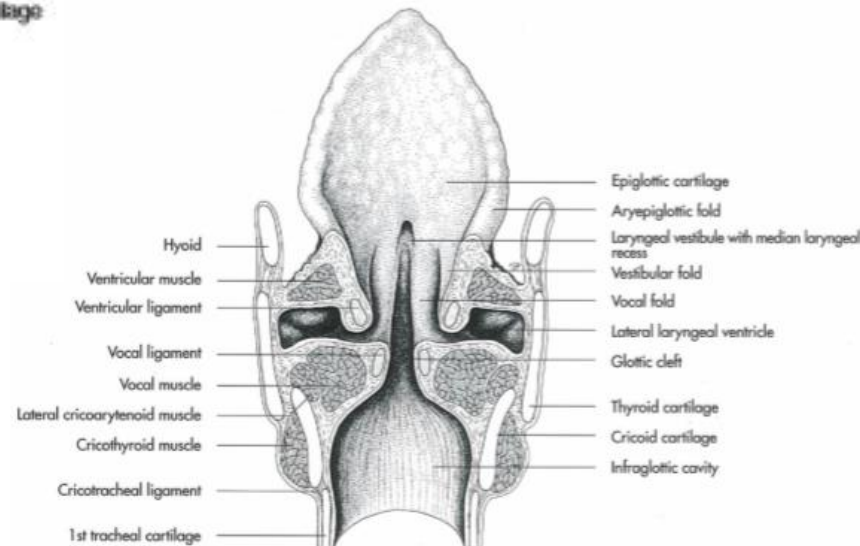
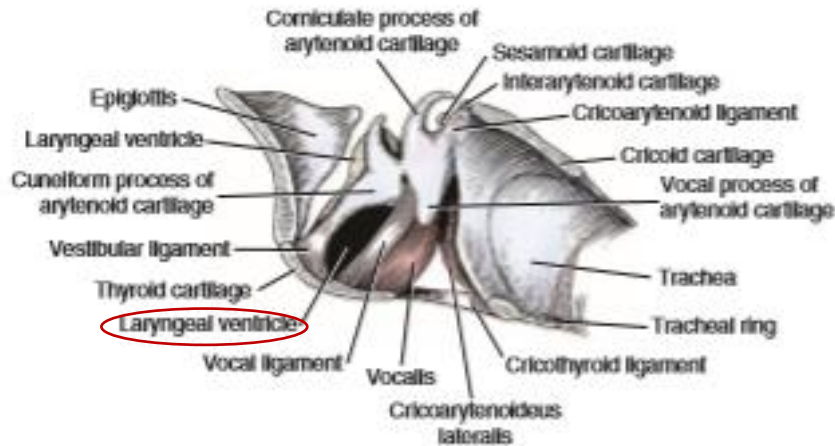
Cut through the larynx of a horse

https://en.wikipedia.org/wiki/Infraglottic_cavity

KEHLKOPFHÖHLE (CAVUM LARYNGIS)

GLOTTIS:

- mittlere Kehlkopfraum
- kaudal an das Vestibulum laryngis schließt
- reicht bis zum kaudalen Rand des Plica vocalis
- besitzt bei Hd., Schw., Pfd – die Ventriculi laryngis (seitliche Kehlkopftaschen)



- 1 hyoid bone
- 2 epiglottis
- 3 vestibular fold
- 4 vocal fold
- 5 Ventricularis muscle
- 6 ventricle of larynx
- 7 Vocalis muscle
- 8 thyroid cartilage lamina
- 9 Cricoid cartilage
- 10 infraglottic cavity
- 11 first bronchial tube cartilage
- 12 bronchial tube

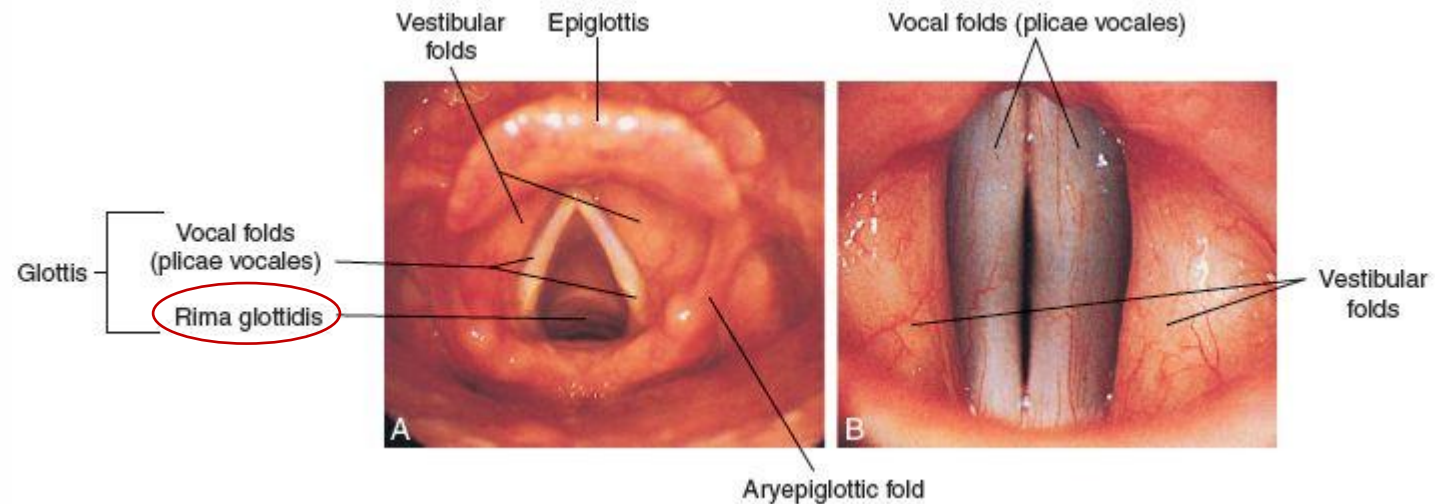
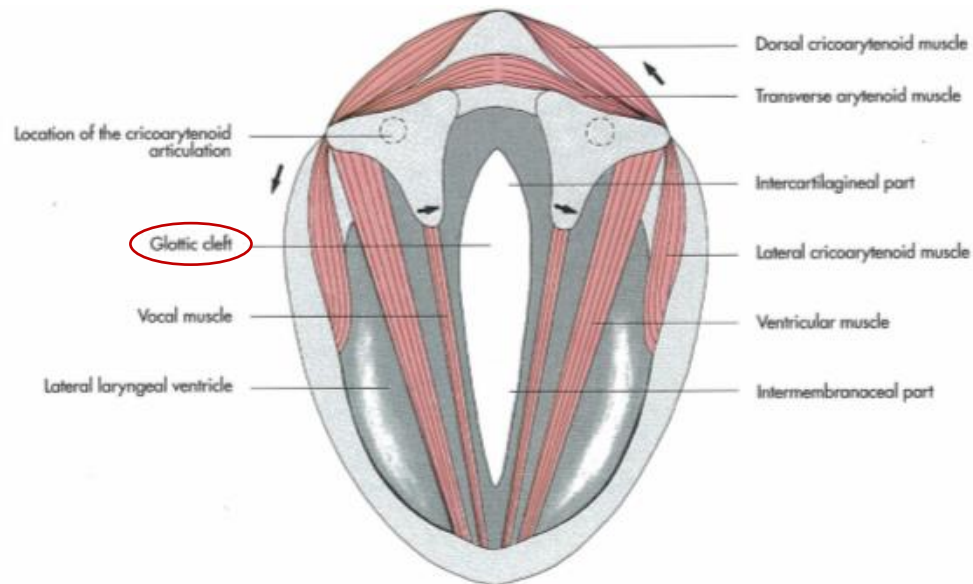
Cut through the larynx of a horse

https://en.wikipedia.org/wiki/Infraglottic_cavity

KEHLKOPFHÖHLE (CAVUM LARYNGIS)

RIMA GLOTTIDIS (STIMMRITZE, Glottic cleft):

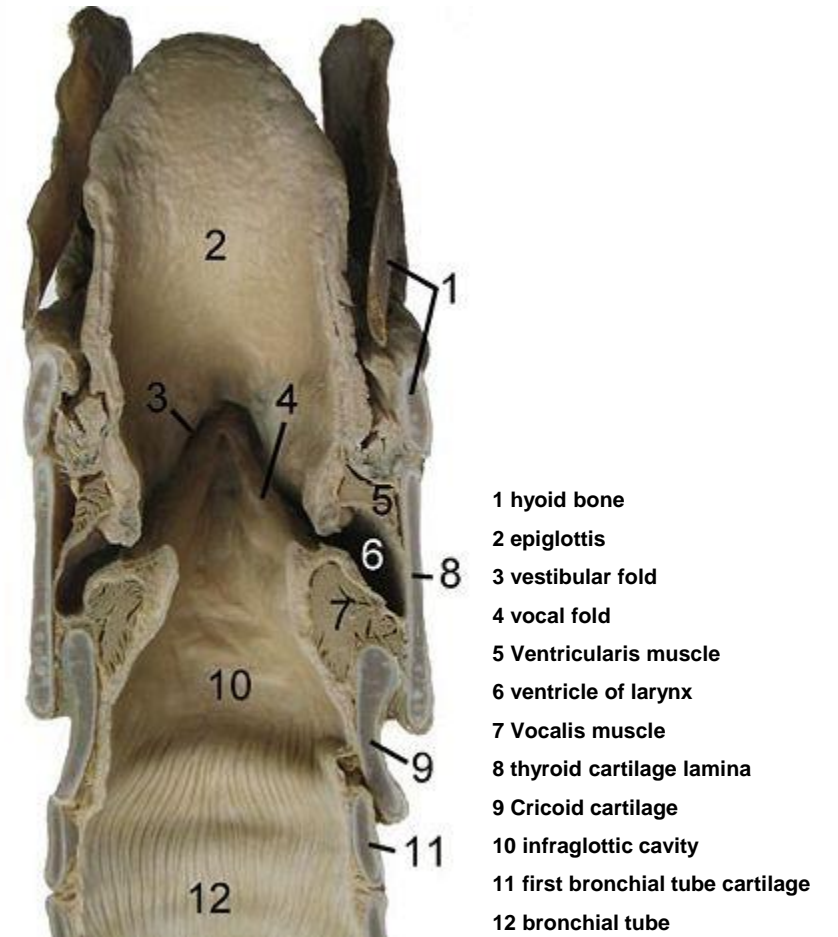
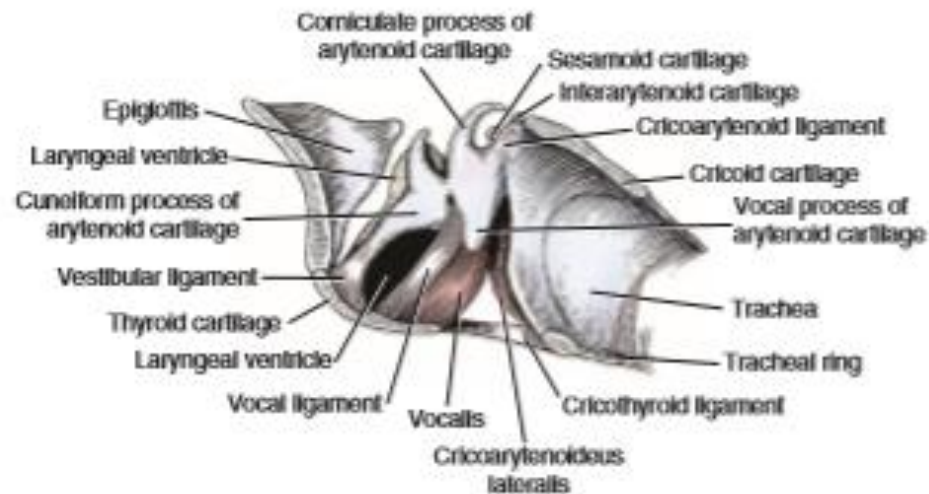
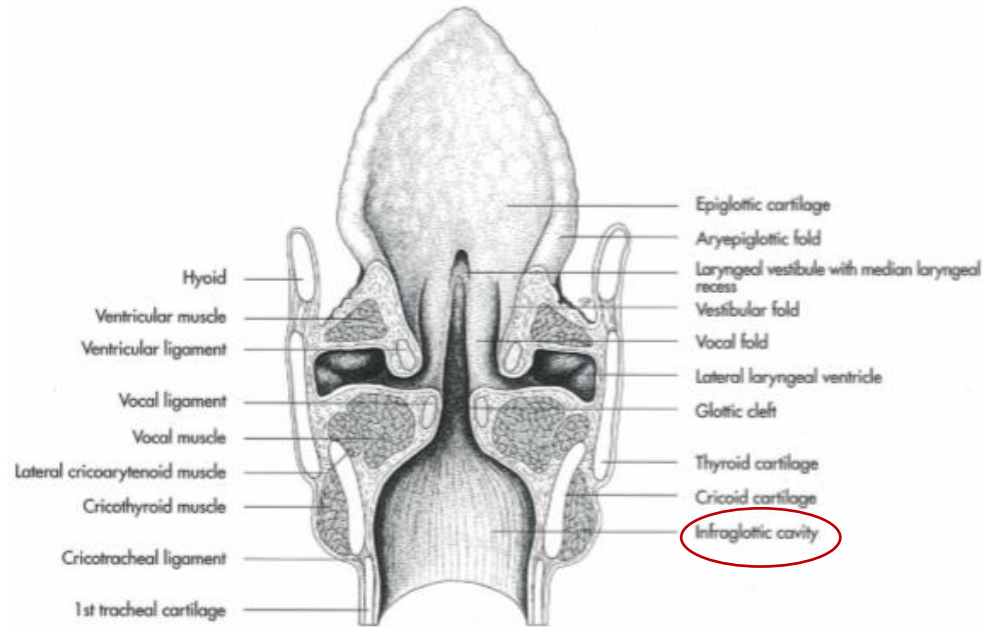
- beherbergt den Apparat der Stimmbildung
- Raum zwischen Stimmbänder
- der ventrale Abschnitt der Stimmritze - liegt als Pars intermembranacea zwischen den Stimmfalten
- dorsaler Abschnitt – zwischen den Stellknorpels – Pars intercartilagineae



KEHLKOPFHÖHLE (CAVUM LARYNGIS)

CAVUM INFRAGLOTTICUM:

- kaudal von Rima glottidis
- geht in die Trachea über



Cut through the larynx of a horse

https://en.wikipedia.org/wiki/Infraglottic_cavity

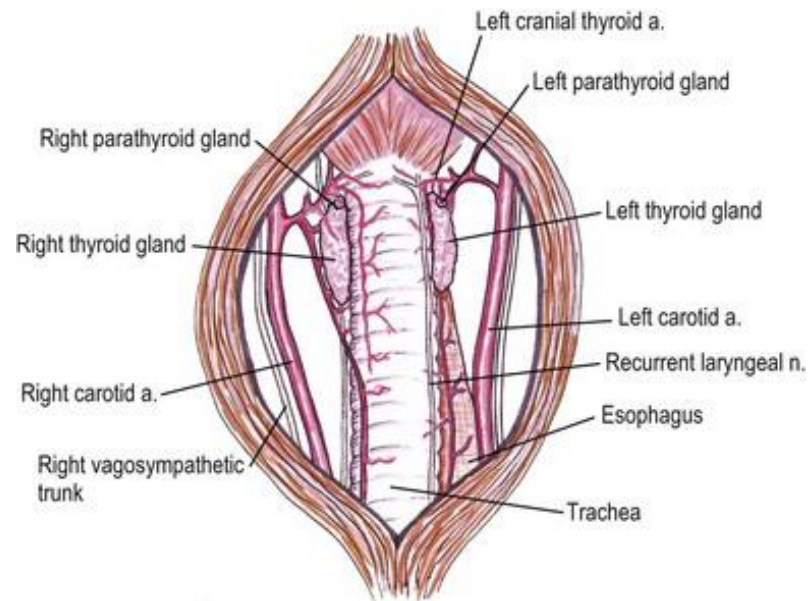
VERSORGUNG DES KEHLKOPFES

A. thyroidea cranialis (aus der A. carotis comm.):

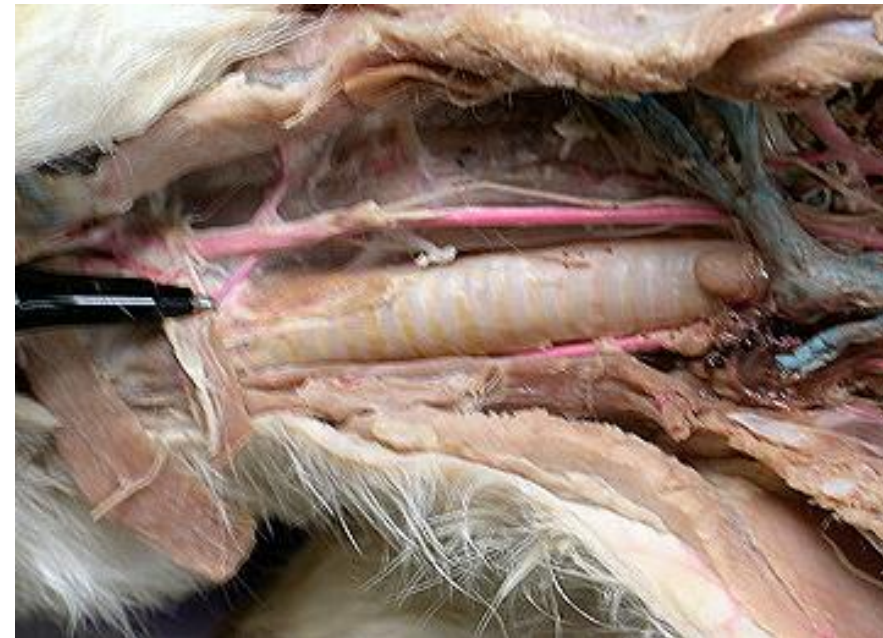
a. Ramus laryngeus

b. Rr. musculares

- die Kehlkopfarterie tritt durch die Fissura thyroidea ins Kehlkopfsinnere – versorgt den M. vocalis, M. ventricularis, die Schleimhaut



<https://veteriankey.com/thyroid-and-parathyroid/>

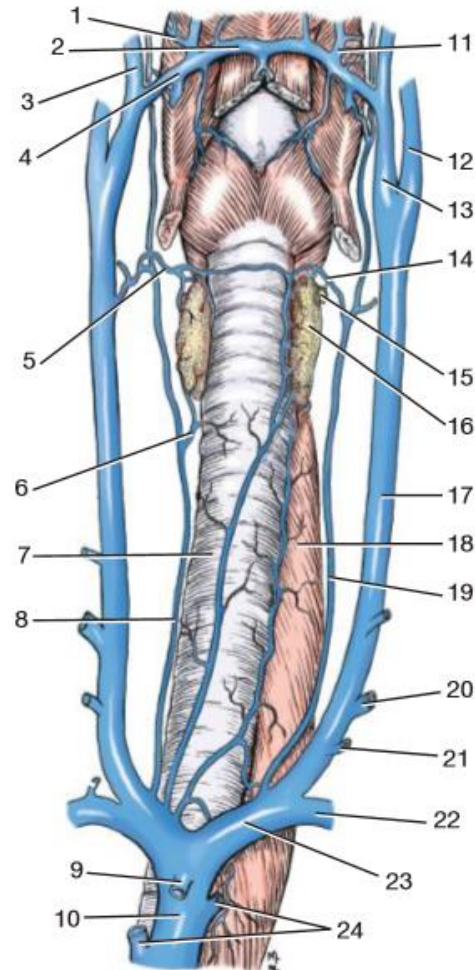


The cranial thyroid artery is the first medial branch of the common carotid artery that we will study. It serves the thyroid gland. I left the picture on the left in for orientation.

<http://faculty.ccri.edu/wjohnson/lab5new2/cranialthy.htm>

VERSORGUNG DES KEHLKOPFES

- V. laryngea cranialis
- Äste der V. lingofacialis
- V. laryngea impar
- V. jugularis ext. et int.



1. Pharyngeal branch
2. Hyoid venous arch
3. Facial
4. Lingual
5. Cranial thyroid
6. Middle thyroid
7. Trachea
8. Right internal jugular
9. Internal thoracic trunk
10. Cranial vena cava
11. Lingual
12. Maxillary
13. Linguofacial
14. Cranial thyroid
15. Parathyroid gland
16. Thyroid gland
17. External jugular
18. Esophagus
19. Left internal jugular
20. Superficial cervical
21. Cephalic
22. Subclavian
23. Brachiocephalic
24. Costocervical veins

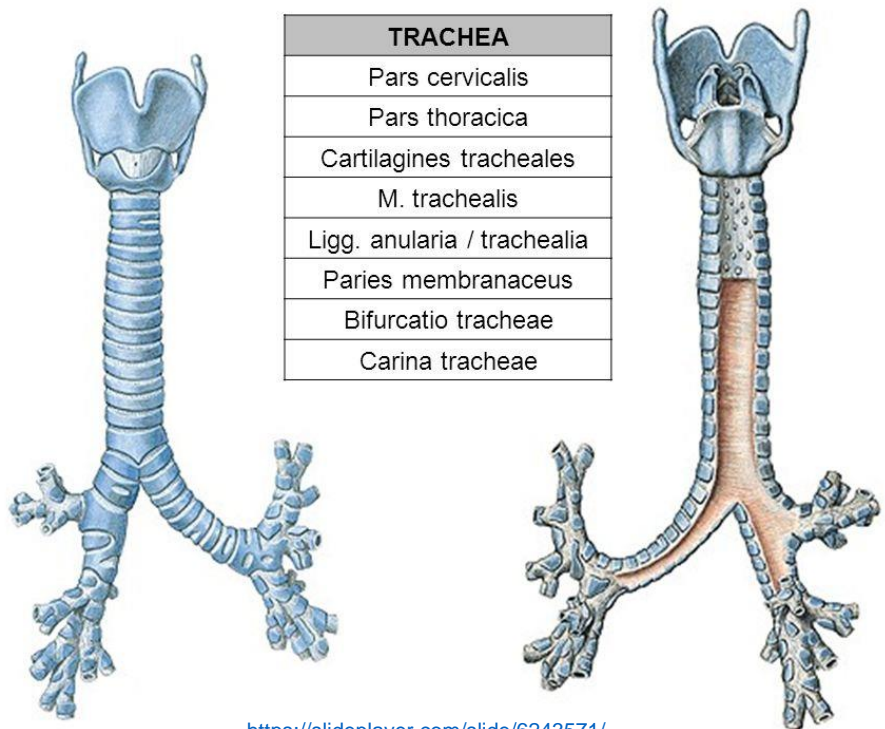
Note: Ventral aspect.

LUFTRÖHRE (TRACHEA)

- schließt kaudal an den Ringknorpel an

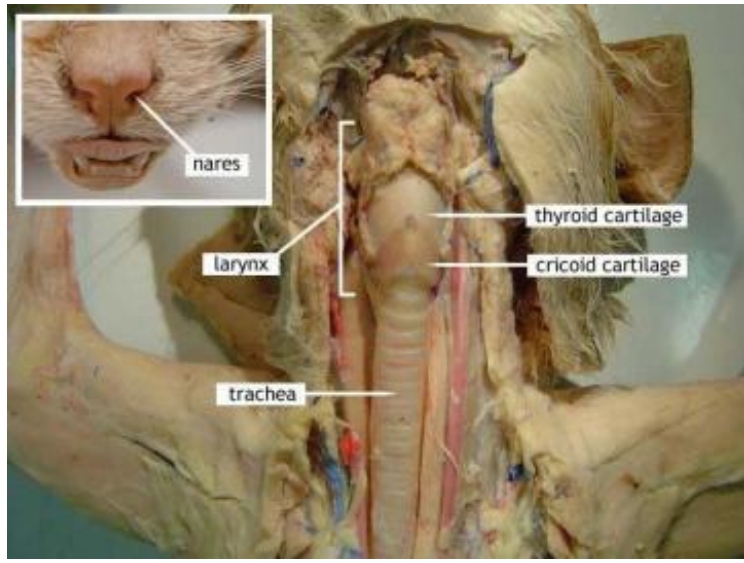
besteht aus:

1. von dorsal offenen hyalinen Knorpelspangen (Trachealspangen, Cartilagine tracheales)
2. Bänder (Ligg. anularia)
3. Paries membranaceus (Dorsalwand) - M. trachealis

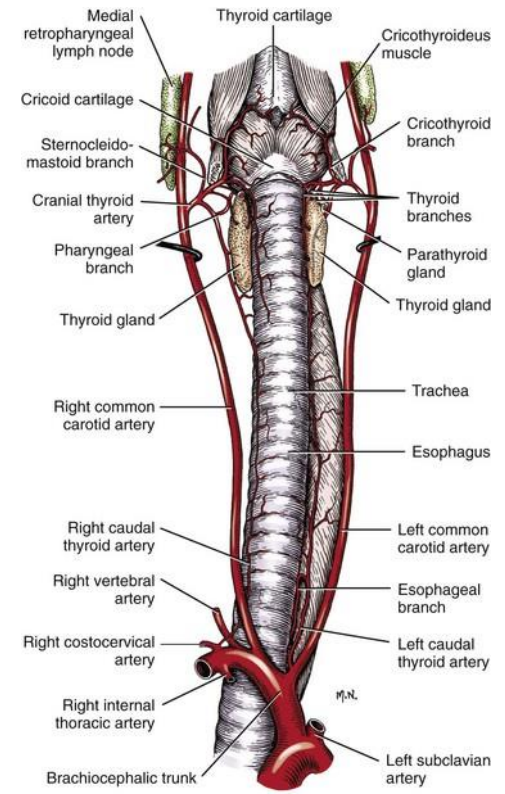


TRACHEA
Pars cervicalis
Pars thoracica
Cartilagine tracheales
M. trachealis
Ligg. anularia / trachealia
Paries membranaceus
Bifurcatio tracheae
Carina tracheae

<https://slideplayer.com/slide/6243571/>



<https://www.studyblue.com/notes/n/thorax-viscera-organs-vessels/deck/3625574>



<https://veteriankey.com/trachea-and-bronchi/>

LUFTRÖHRE (TRACHEA)

- die Form der Trachealspangen ist je nach Tierart verschieden

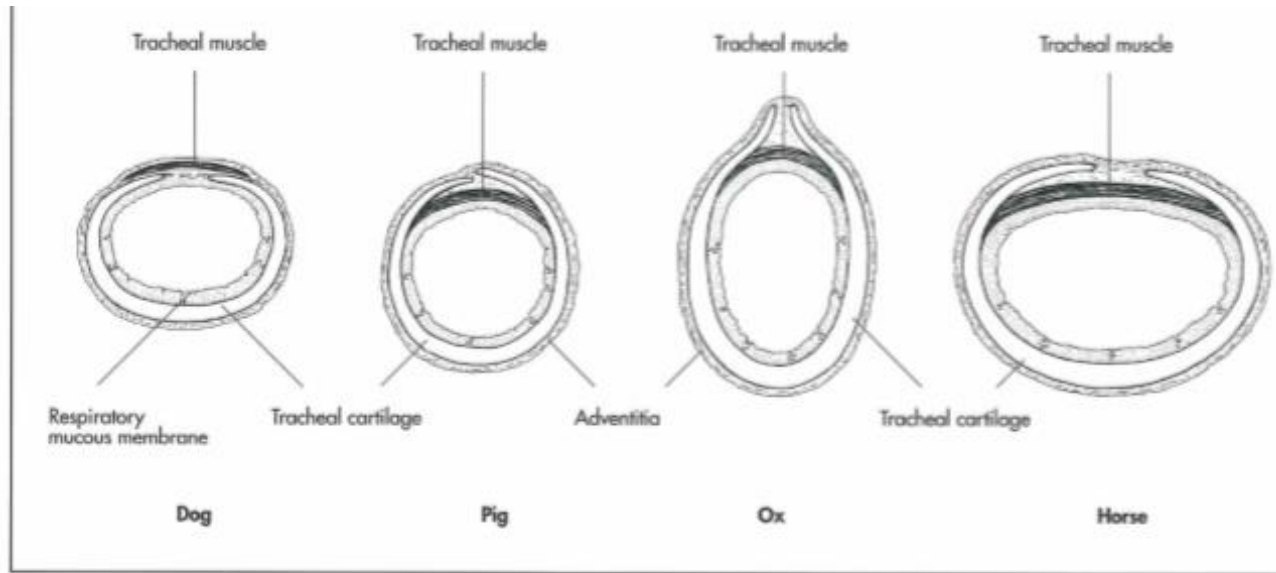
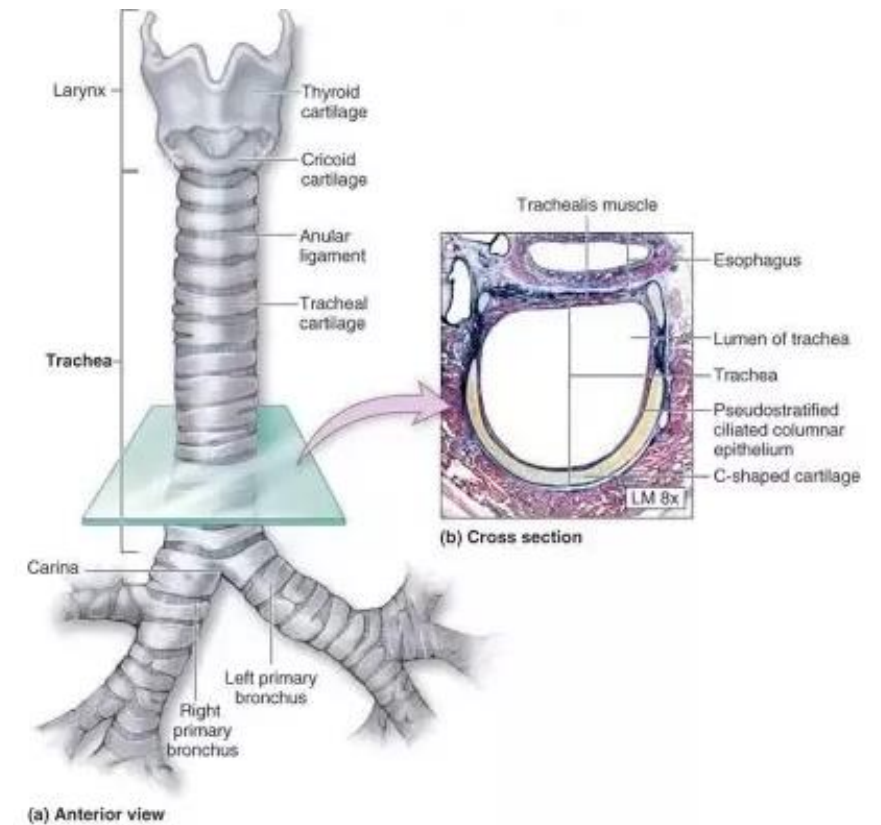


Fig. 8-25. Transverse section of the trachea of the different domestic species, schematic.



LUFTRÖHRE (TRACHEA)

ANZAHL DER TRACHEALSPANGEN:

Pferd: 48 – 60

Rind: 48 – 60

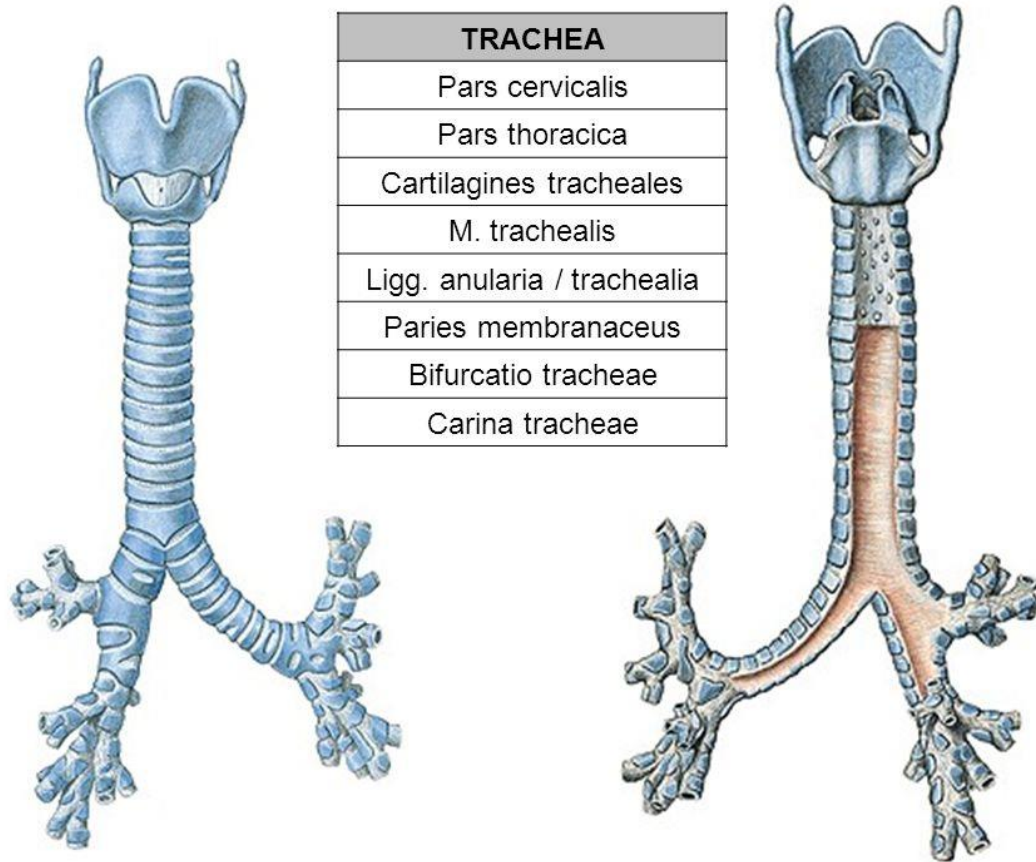
Schaf: 48 - 60

Ziege: 48 – 60

Schwein: 29 – 36

Hund: 42 – 46

Katze: 38 - 43



LUFTRÖHRE (TRACHEA)

Paries membranaceus (Dorsalwand)

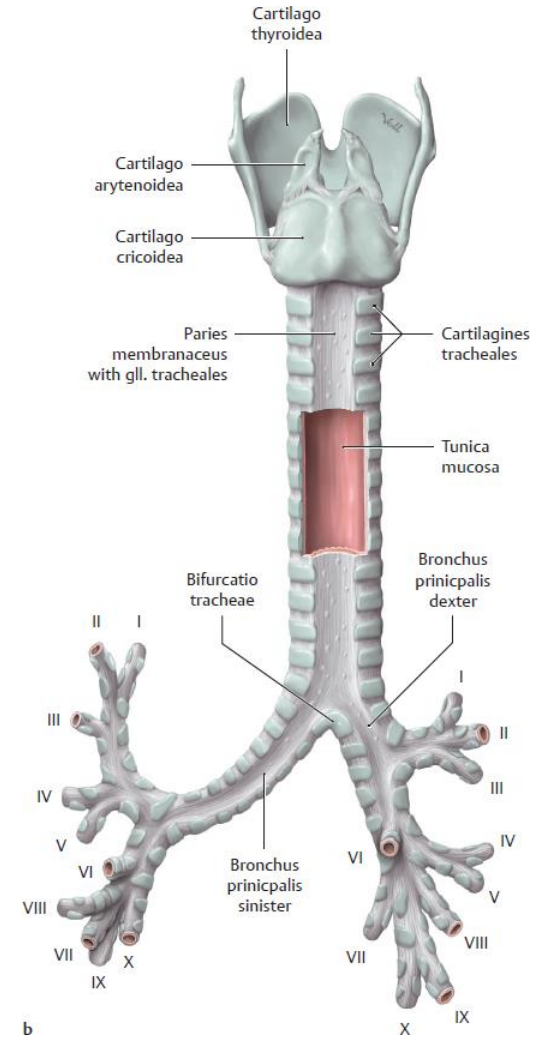
MUSCULUS TRACEALIS:

- bei Schw., Wdk., Pfd. - ligt in der Tunica submucosa

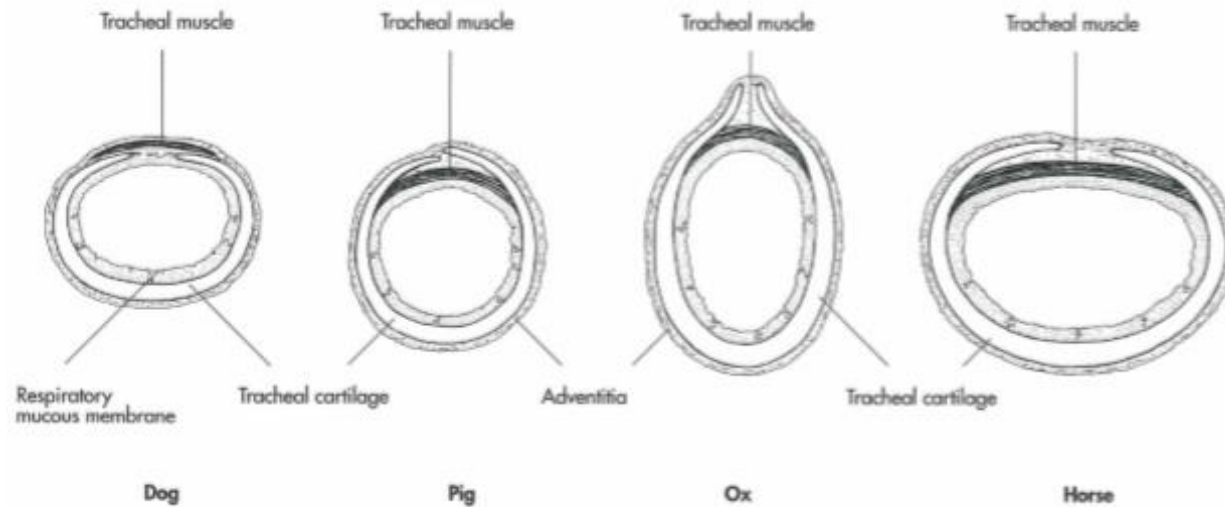
- beim Flfr. – liegt auf den Trachealspangen



<https://hu.pinterest.com/maidahzahid/res-tract/>



<https://basicmedicalkey.com/organs-of-the-respiratory-system-and-their-neurovasculature/>



LUFTRÖHRE (TRACHEA)

1. HALSTEIL DER TRACHEA (PARS CERVICALIS):

- liegt ventral von den die Halswirbelsäule bedeckenen Mm. longus colli und capitis

bedeckt ventral von den:

- Mm. sternohyoidei
- Mm. strenothyroidei
- Mm. omohyoidei
- Mm. sternomandibulares
- Mm. brachiocephalici

- ventral von den Zungenbeinmuskeln bedeckt

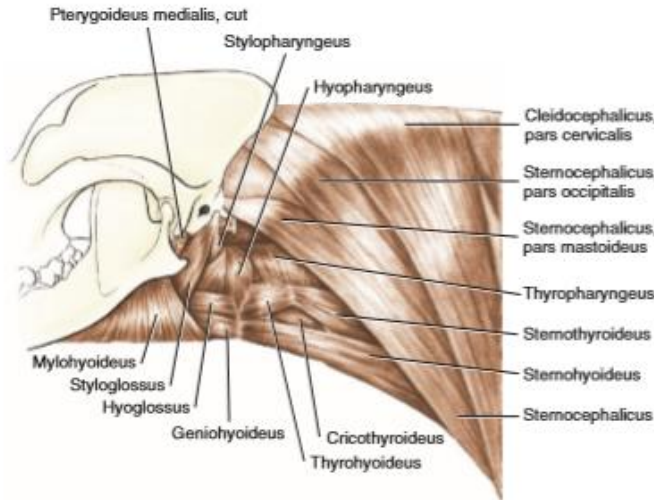
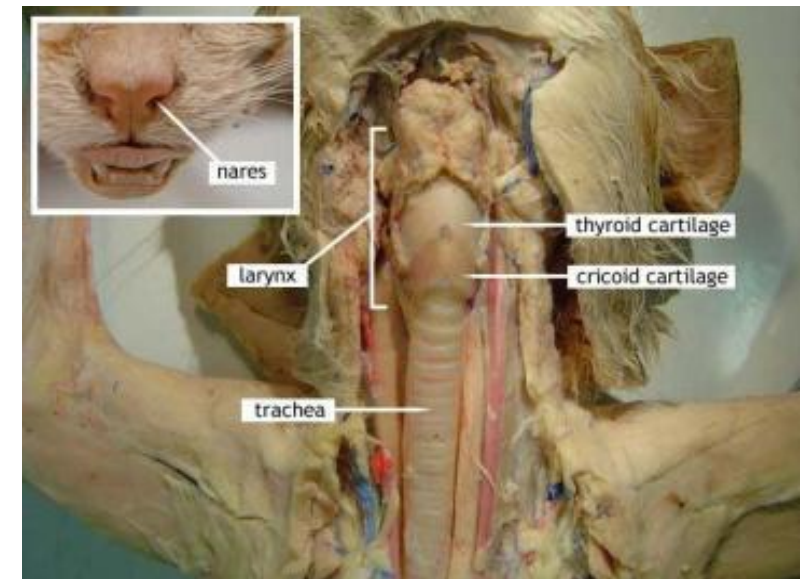
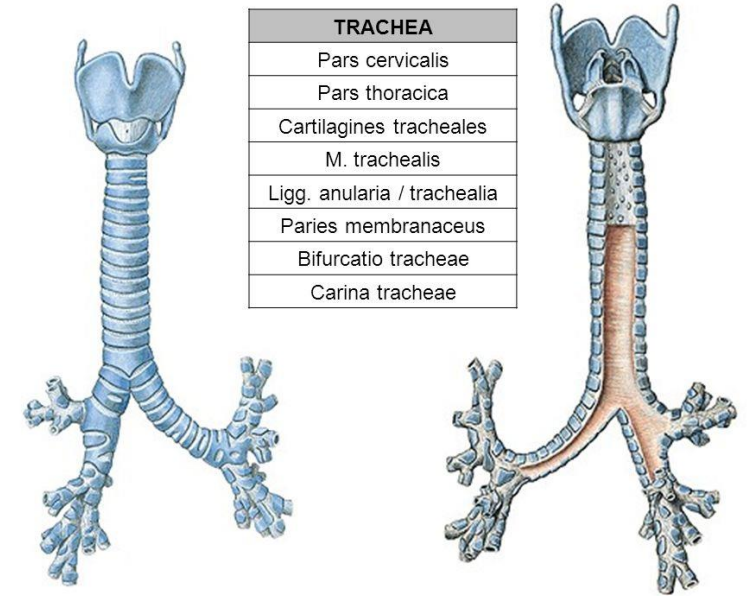
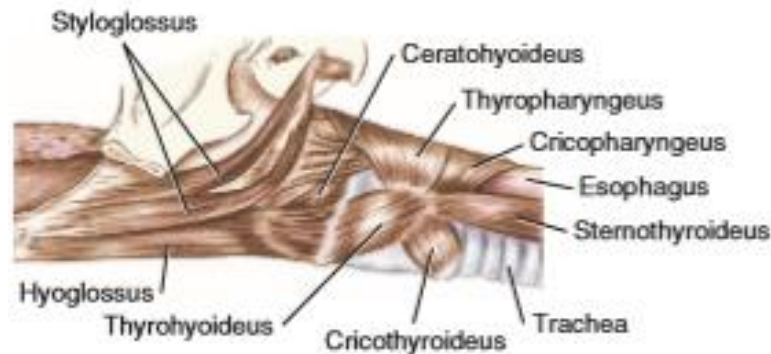


FIGURE 6-21 The hyoid muscles and muscles of the neck, lateral aspect. (Stylohyoideus and digastricus removed.)

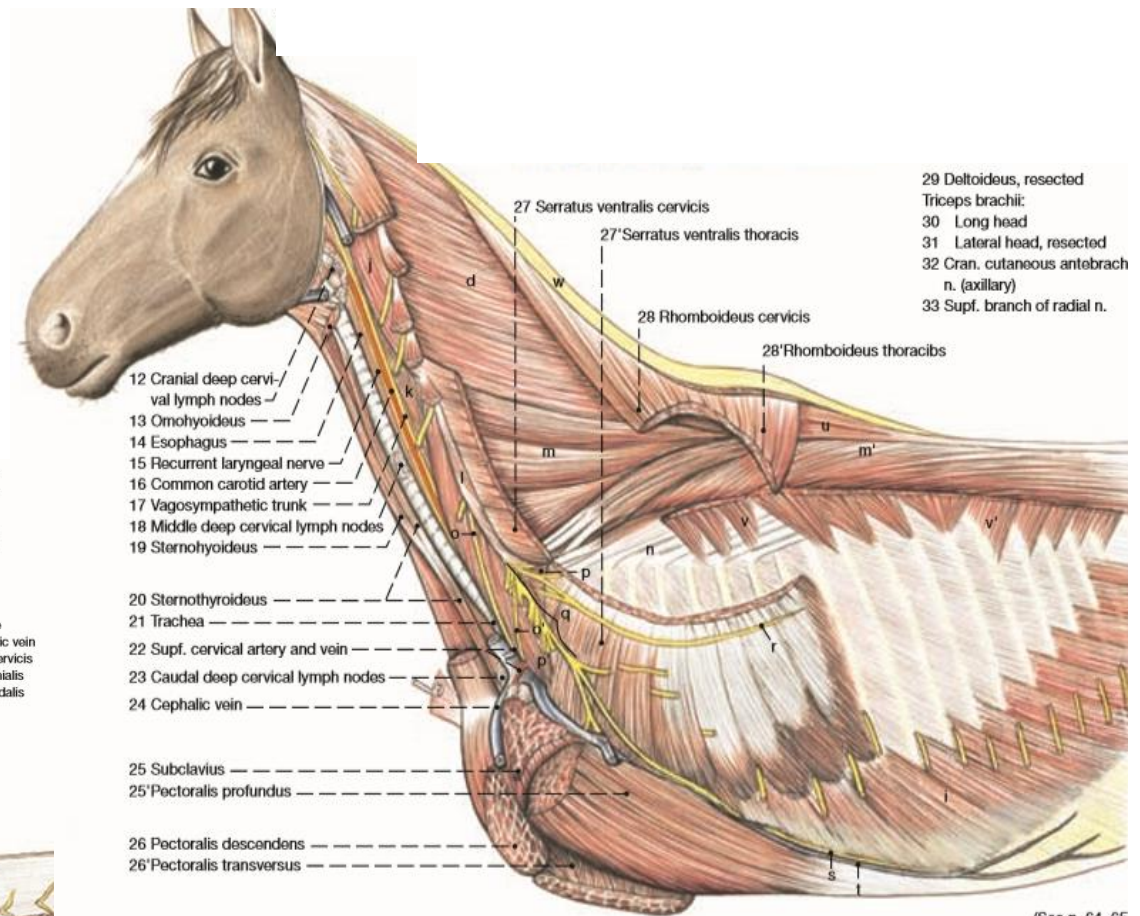
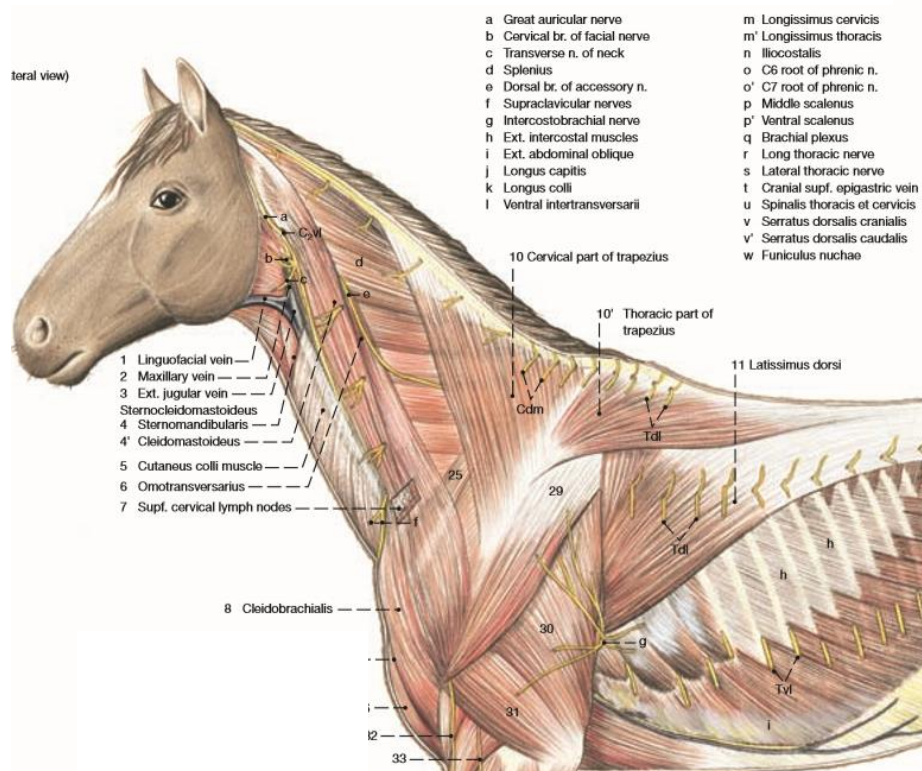


LUFTRÖHRE (TRACHEA)

1. HALSTEIL DER TRACHEA:

benachbart zur Trachea verlaufen auf beiden Seiten:

- die A. carotis comm.
- Truncus vagosympathicus
- V. jugularis ext. (Ausnahme Pfd, Ziege)
- Oesophagus links der Trachea



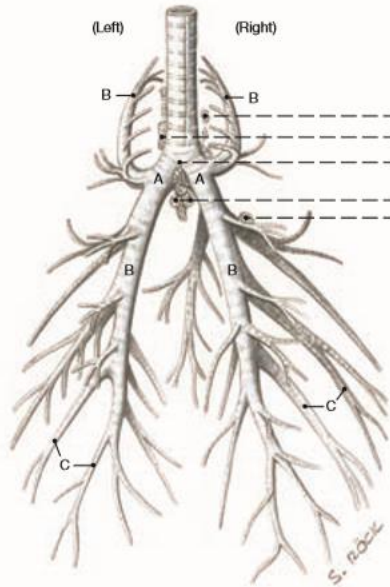
(See p. 64, 65)

LUFTRÖHRE (TRACHEA)

2. BRUSTTEIL DER TRACHEA (PARS THORACICA):

- tritt durch die Apertura thoracis cranialis in die Brusthöhle ein
- teilt sich in Höhe des 5. Interkostalraums dorsal des Herzens in die Hauptbronchien

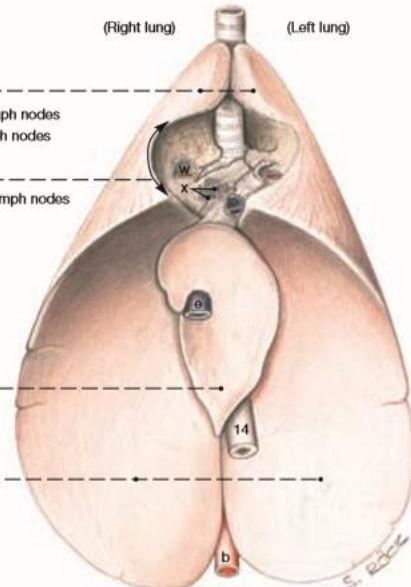
Bronchial Tree, dorsal view



- 18 Cranial lobes
- 19 Right tracheobronchial lymph nodes
- 20 Left tracheobronchial lymph nodes
- 21 Tracheal bifurcation
- 22 Cardiac notch
- 23 Middle tracheobronchial lymph nodes
- 24 Pulmonary lymph nodes

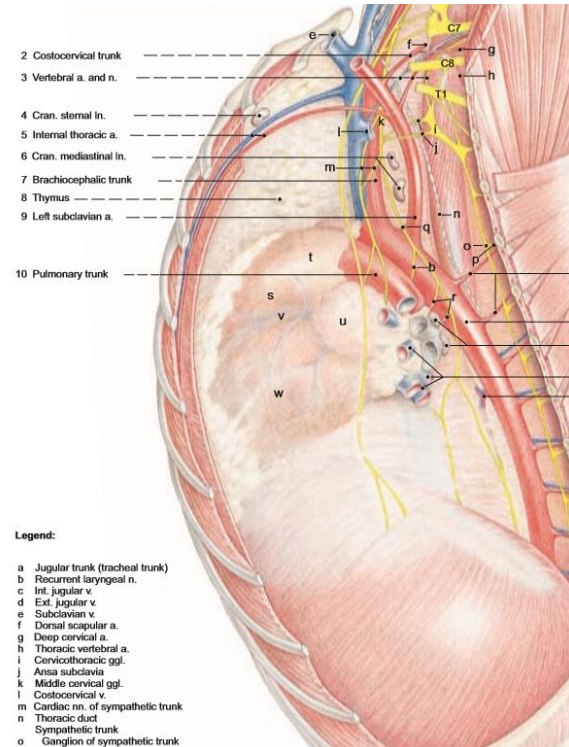
- A Principal bronchus
- B Lobar bronchus
- C Segmental bronchus
- a Retractor costae
- b Aorta
- c Right azygous vein
- d Dorsal and ventral vagal trunks
- e Caudal vena cava
- f Caval fold
- g Mediastinal recess
- h Phrenic nerve
- i Pericardial pleura
- j Semispinalis capitis
- k Intercostal vessels

Lungs, ventral view



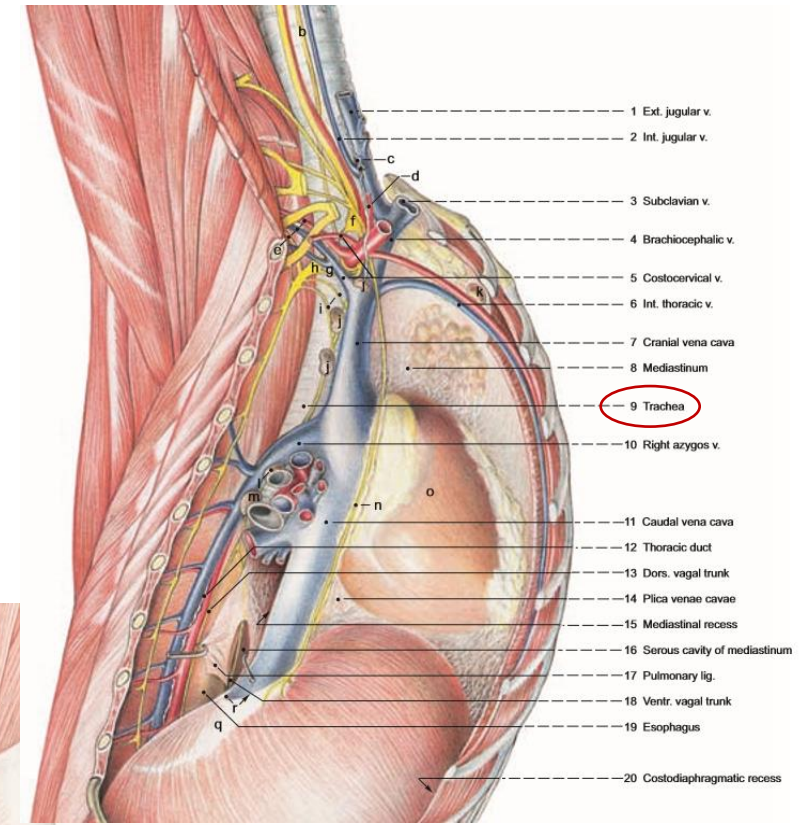
- 25 Accessory lobe
- 26 Caudal lobes

- l Bronchoesophageal vessels
- m Supreme intercostal vessels
- n Dorsal scapular vessels
- o Deep cervical vessels
- p Vertebral vessels and nerve
- q Common carotid a. and vagosympathetic trunk
- r Ext. jugular vein
- s Cephalic vein
- t Axillary vessels
- u Int. thoracic vessels
- v Transversus thoracis
- w Pulmonary artery
- x Pulmonary veins



Legend:

- a Jugular trunk (tracheal trunk)
- b Recurrent laryngeal n.
- c Int. jugular v.
- d Ext. jugular v.
- e Subclavian v.
- f Dorsal scapular a.
- g Deep cervical a.
- h Thoracic vertebral a.
- i Cervicothoracic a.
- j Ansa subclavia
- k Middle cervical gg.
- l Costocervical v.
- m Cardiac nn. of sympathetic trunk
- n Thoracic duct
- o Sympathetic trunk
- p Ganglion of sympathetic trunk
- q Cerv. and subcl. vv.



- 1 Ext. jugular v.
- 2 Int. jugular v.
- 3 Subclavian v.
- 4 Brachiocephalic v.
- 5 Costocervical v.
- 6 Int. thoracic v.
- 7 Cranial vena cava
- 8 Mediastinum
- 9 Trachea
- 10 Right azygos v.
- 11 Caudal vena cava
- 12 Thoracic duct
- 13 Dors. vagal trunk
- 14 Plica venae cavae
- 15 Mediastinal recess
- 16 Serous cavity of mediastinum
- 17 Pulmonary lig.
- 18 Ventr. vagal trunk
- 19 Esophagus
- 20 Costodiaphragmatic recess

- 11 Intercostal aa.
- 12 Descending aorta
- 13 Left tracheobronchial lymph nodes
- 14 Pulmonary veins
- 15 Bronchoesophageal a. + v.

LUFTRÖHRE (TRACHEA)

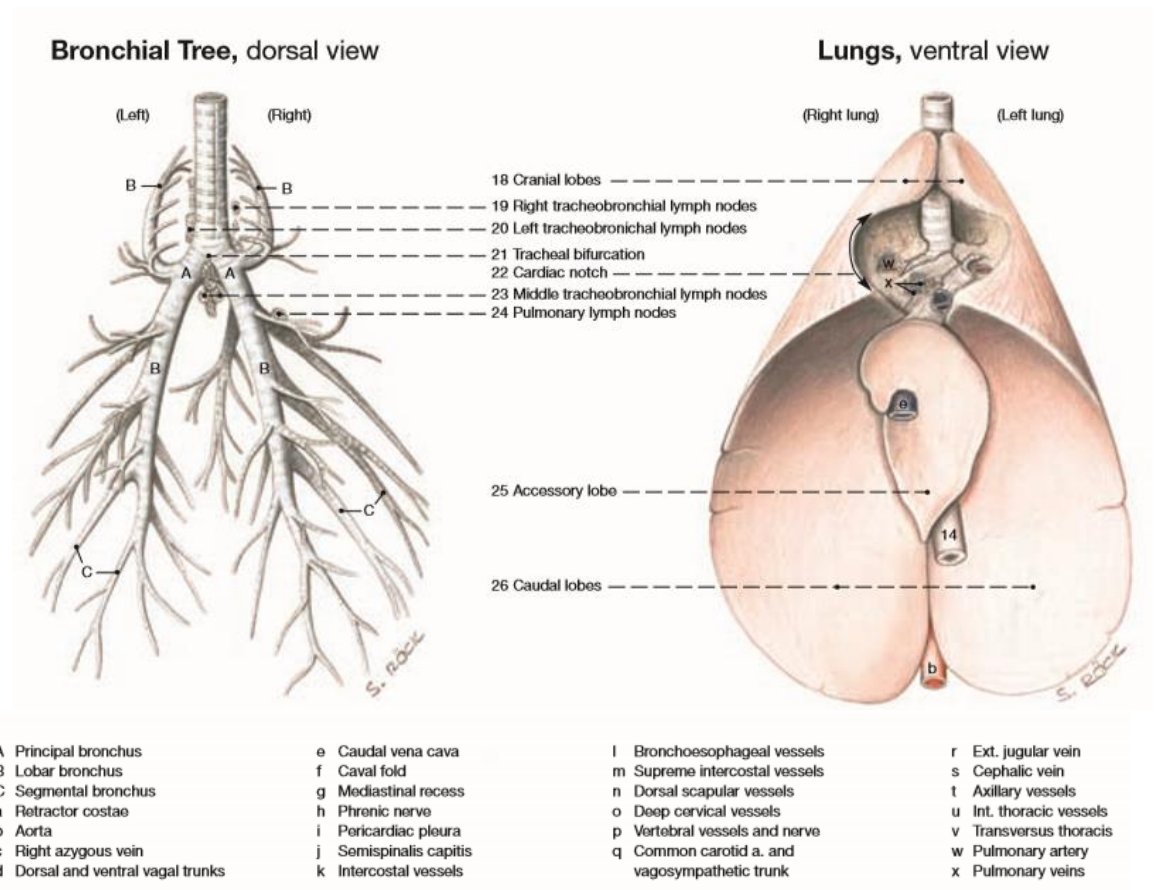
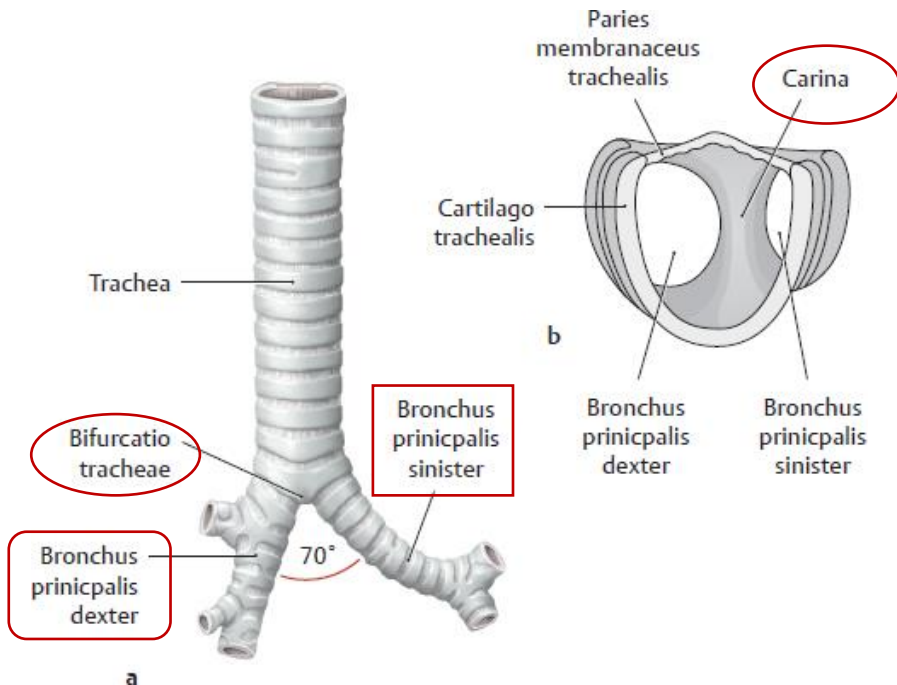
2. BRUSTTEIL DER TRACHEA (PARS THORACICA):

BIFURCATIO TRACHEAE:

1. BRONCHUS PRINCIPALIS DEXTER – kurzer, steiler

2. BRONCHUS PRINCIPALIS SINISTER

- beim Hund, bei der Katze: CARINA TRACHEAE in der Bifurcatio tracheae



LUFTRÖHRE (TRACHEA)

2. BRUSTTEIL DER TRACHEA:

- beim Wdk. , Schw. – entlässt die Trachea auf der rechten Seite von ihrer Teilung einen **Bronchus trachealis**
- **Bronchus trachealis** – beim Wdk, Schw. – den Lobus cranialis dexter belüftet

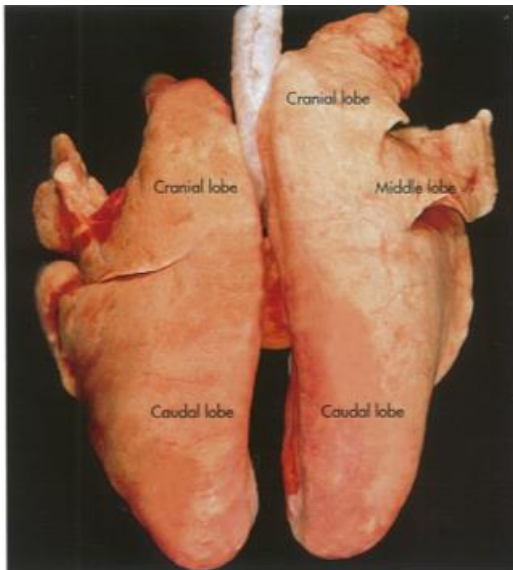


Fig. 8-31. Lungs of a pig, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

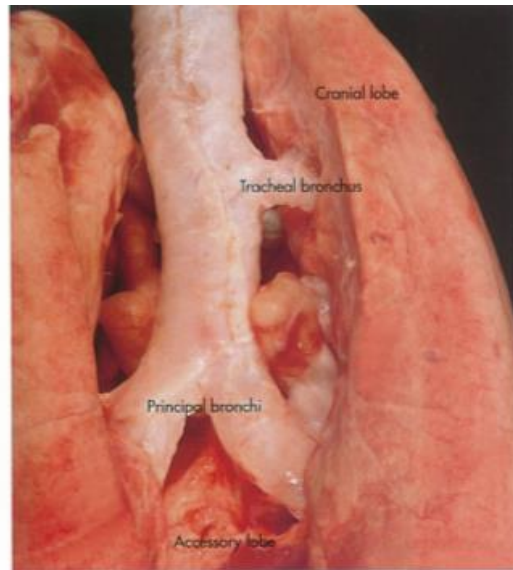


Fig. 8-32. Lungs of a pig, demonstrating the tracheal bronchus, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

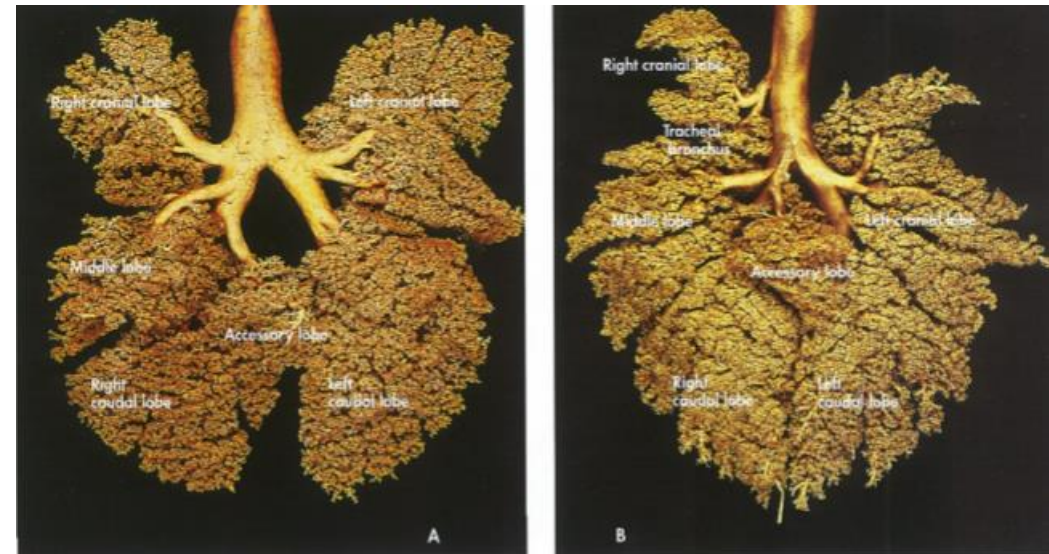


Fig. 8-33. Trachea and bronchial tree of a dog (A) and the pig (B), corrosion cast, ventral aspect.

LUNGE (PULMO)

- schwammige, elatische, mit Luft gefüllte Organe
- den größten Teil der Brusthöhle einnehmen
- füllen die beiden Pleurasäcke aus
- die Farbe der Lunge: von deren Blutfülle abhängig

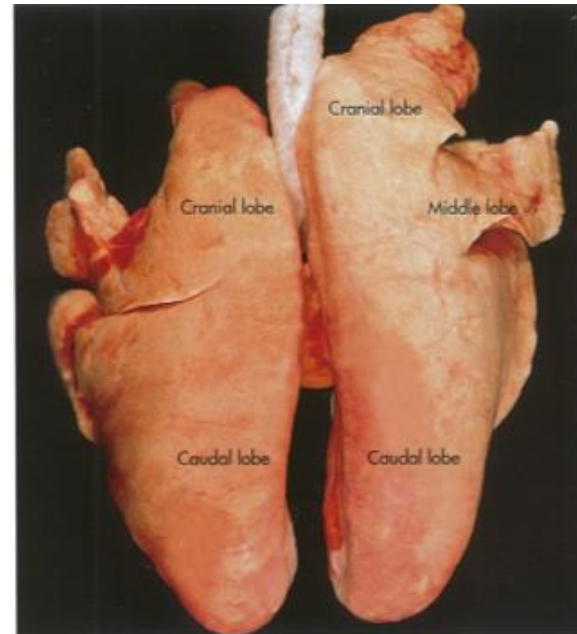


Fig. 8-31. Lungs of a pig, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

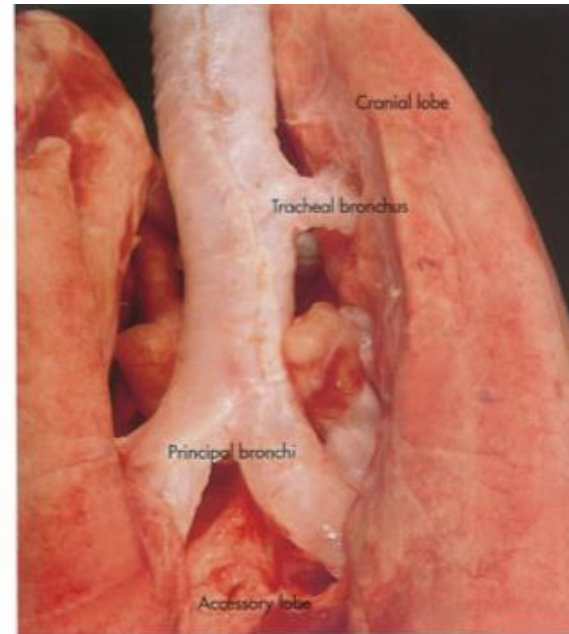


Fig. 8-32. Lungs of a pig, demonstrating the tracheal bronchus, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

LUNGE (PULMO)

man unterscheidet zwei Lungen:

1. Pulmo dextra
2. Pulmo sinistra

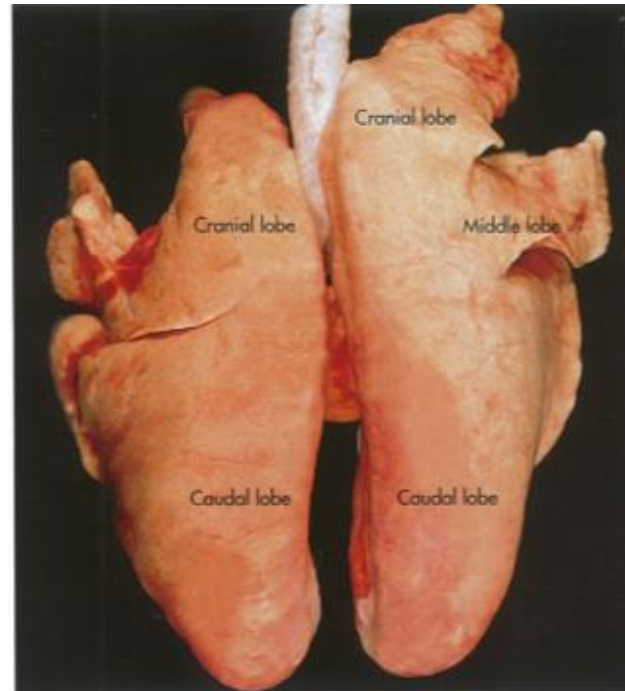


Fig. 8-31. Lungs of a pig, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

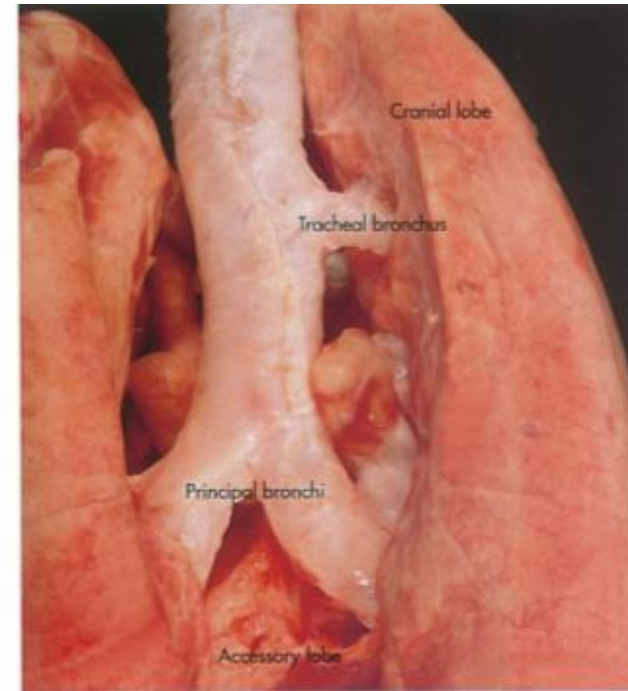


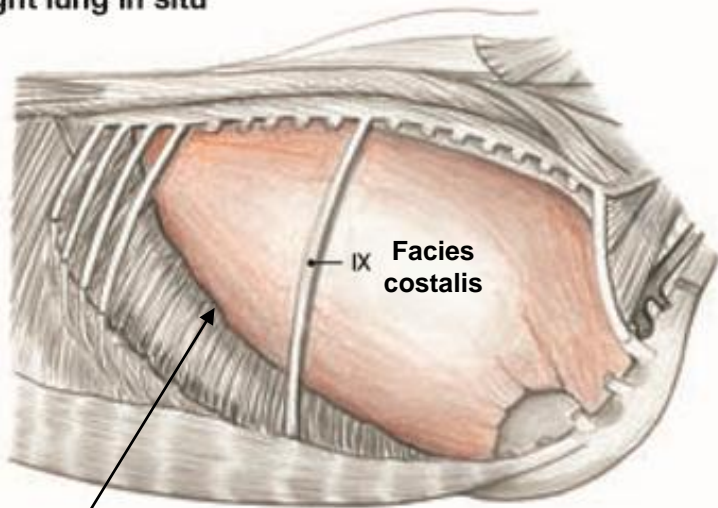
Fig. 8-32. Lungs of a pig, demonstrating the tracheal bronchus, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

LUNGE (PULMO)

FLÄCHE DER LUNGE:

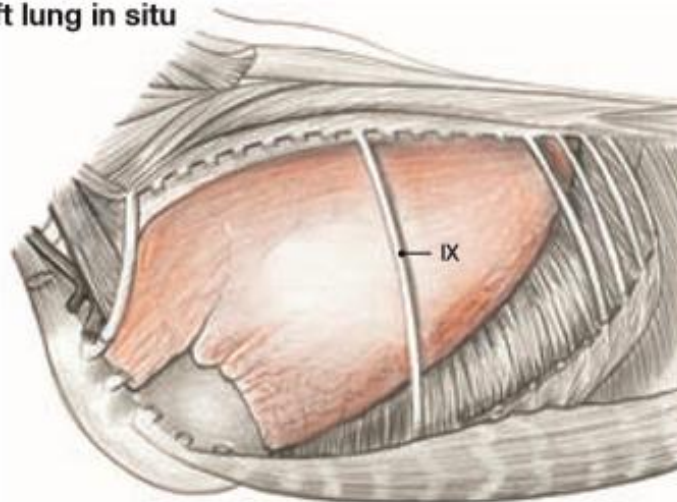
1. FACIES COSTALIS
2. FACIES MEDIASTINALIS
3. FACIES DIAPHRAGMATICA

Right lung in situ



Facies diaphragmatica

Left lung in situ



Eq

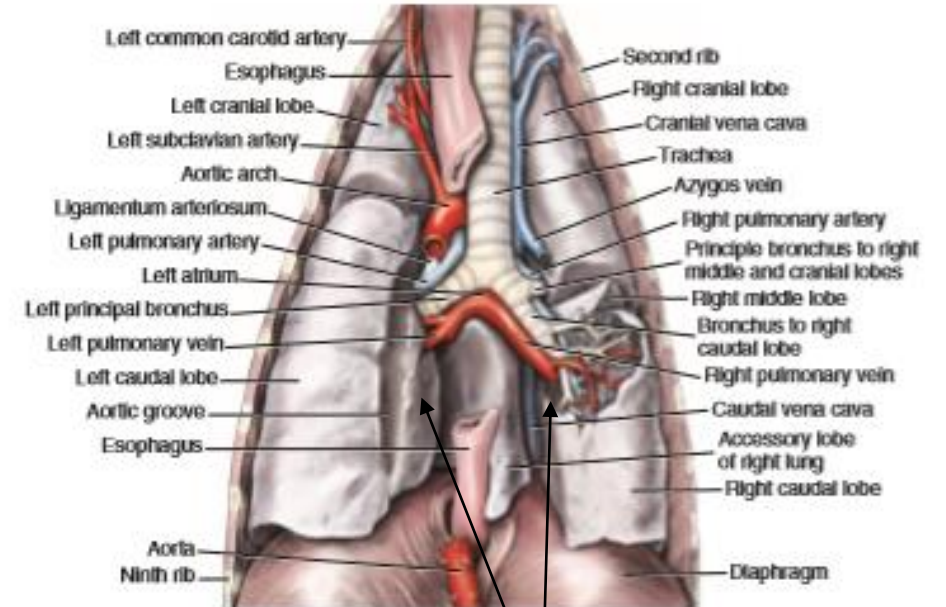


FIGURE 8-23 Bronchial tree and associated structures, dorsal aspect.

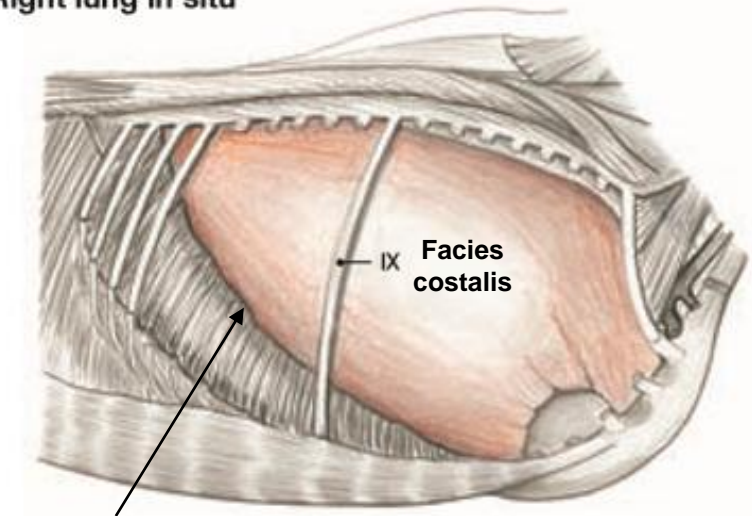
Ca
Facies mediastinalis

LUNGE (PULMO)

FACIES COSTALIS

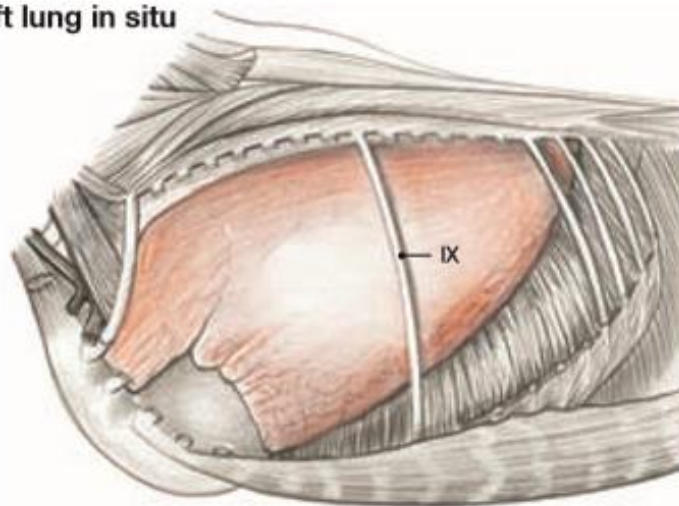
- der Rippenwand anliegende Fläche
- hat mit der Brustwand innigen Kontakt
- Impressio costales

Right lung in situ



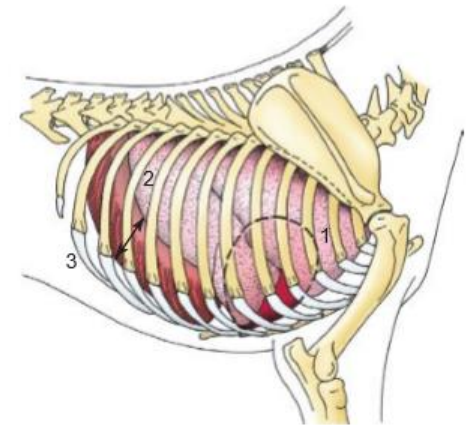
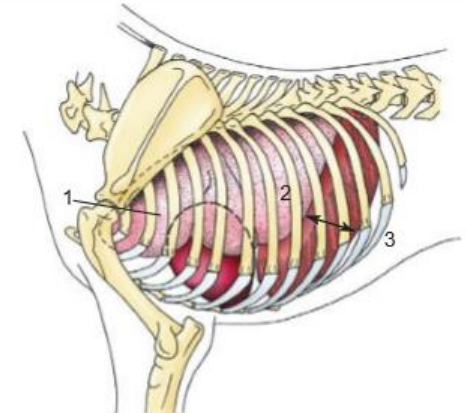
Facies diaphragmatica

Left lung in situ



Eq

Canine: Thoracic Organs
(Left View [Top] and
Right View [Bottom])



1. Cranial lobe
2. Caudal lobe
3. Costodiaphragmatic recess (arrow)

Note: The outline of the heart is indicated (broken line).

LUNGE (PULMO)

FACIES MEDIASTINALIS

- dem Mediastinum zugewandte

1. Impressio cardiaca (Herzbucht)

- in die das Herz mit dem Herzbeutel eingebettet ist

- das Herz zum größten Teil links liegt – die Bucht der linken Lunge tiefer als die der rechten

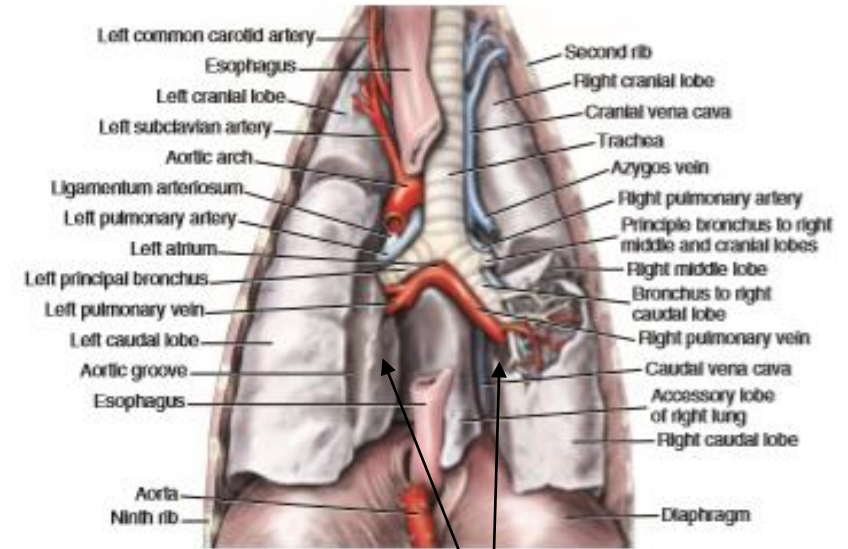
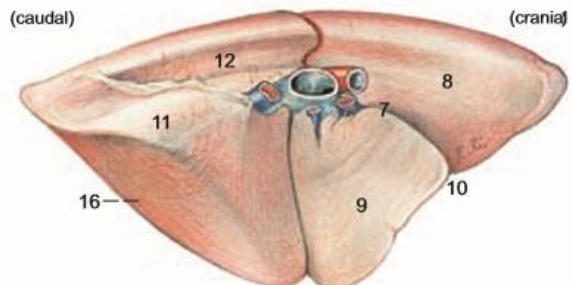
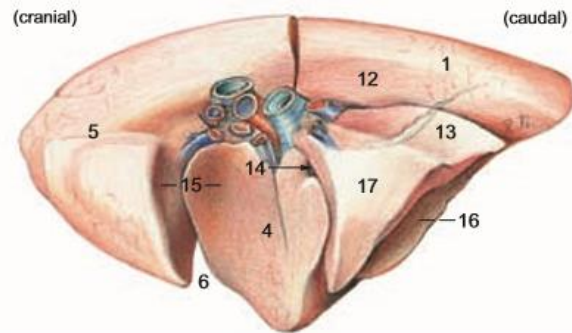


FIGURE 9-23 Bronchial tree and associated structures, dorsal aspect.

Ca

Facies mediastinalis

Right and left lung (medial aspect)



Ca.

6. **Incisura cardiaca dext.**

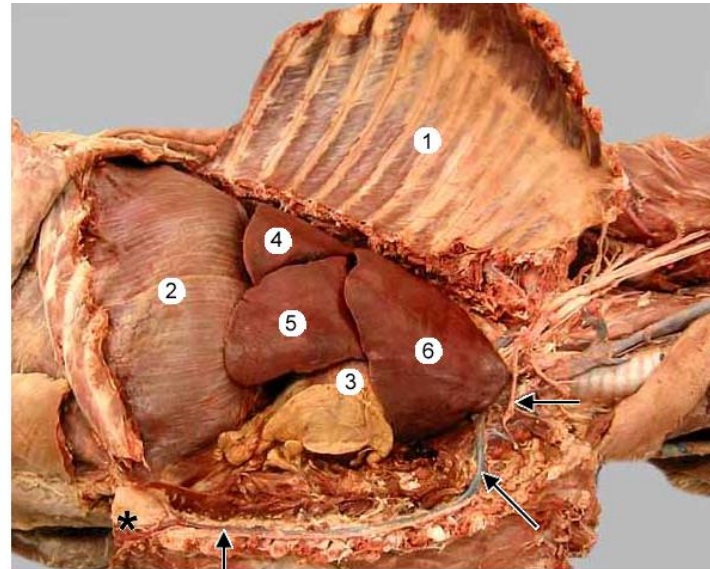
10. **Incisura cardiaca sin.**

12. **Impressio aortica**

13. **Impressio oesophagea**

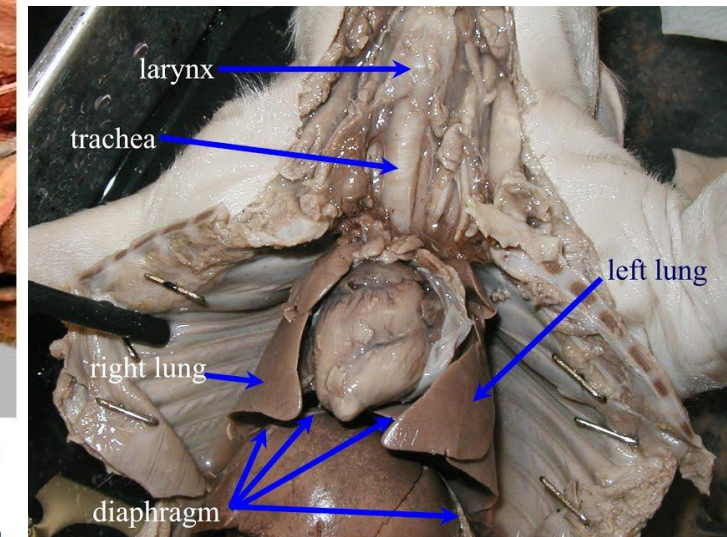
14. **Sulcus venae cavae**

16. **Facies diaphragmatica**



The pleural cavity has been opened by reflecting the right thoracic wall. The thoracic wall (1) is covered by **costal parietal pleura**. The diaphragm (2) is covered by **diaphragmatic parietal pleura**. The mediastinum, including the heart (3), is covered by **mediastinal parietal pleura**. The caudal (4), middle (5), and cranial (6) lobes of the right lung are covered by **visceral (pulmonary) pleura**. Cranial and middle lobes of the right lung form a cardiac notch (3) through which the heart is exposed. Internal thoracic vessels (arrows) can be seen terminating in cranial epigastric vessels (asterisk).

<http://vanat.cvm.umn.edu/carnLabs/Lab11/mg11-1.html>

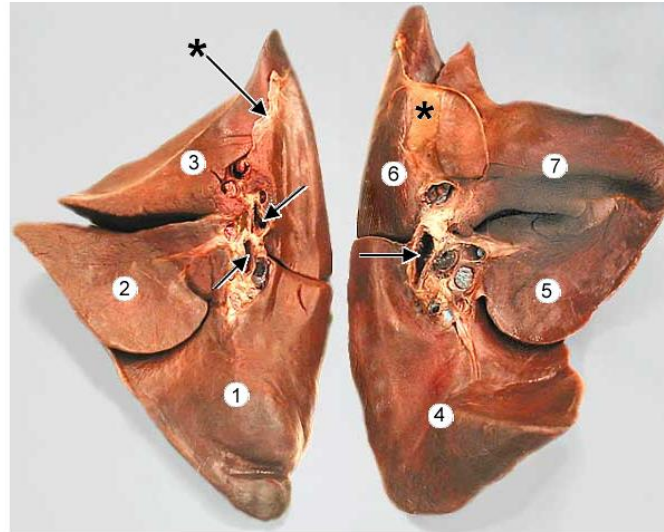


<https://sites.google.com/a/carlabert.edu/dwann/tissue-study/fetal-pig-study>

LUNGE (PULMO)

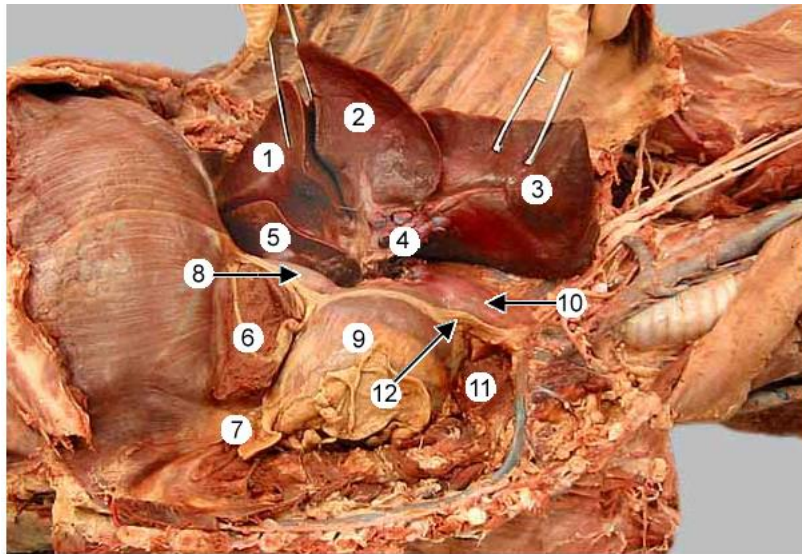
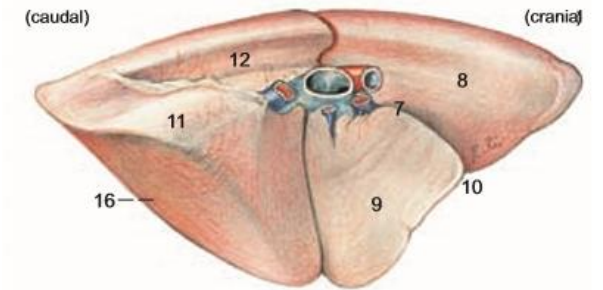
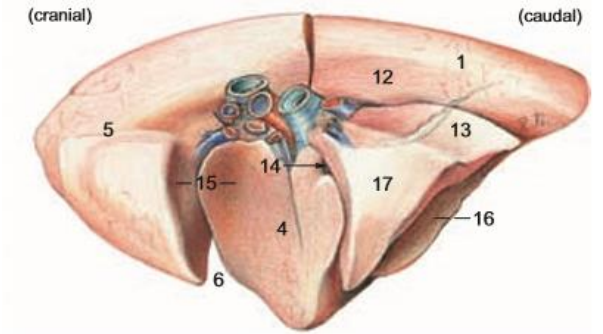
FACIES MEDIASTINALIS

2. Impressio aortica
3. Impressio oesophagea
4. Sulcus venae caevae caudalis



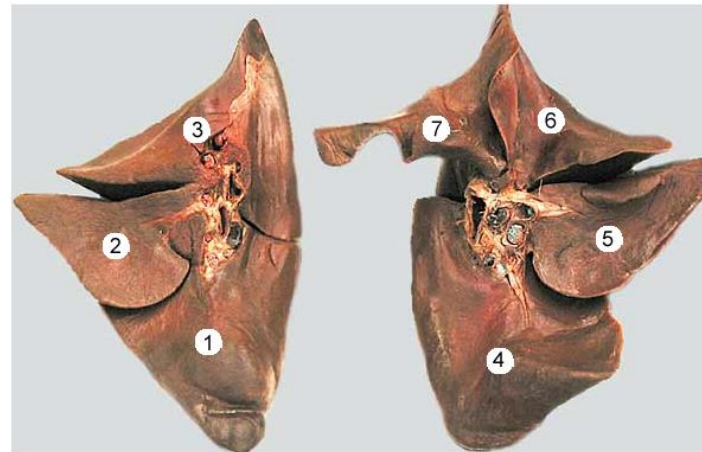
The two lungs are placed on a surface with medial sides up and dorsal borders facing one another, cranial is at the bottom. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. Two lobar bronchi are evident (arrows). *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory (7) lobes. The lumen of the principal bronchus is evident (arrow). On both lungs, a pulmonary ligament (asterisk) is visible caudal to the hilus of the lung.

Right and left lung (medial aspect)



Caudal (1), middle (2), and cranial (3) lobes of the **right lung** are elevated and the root (4) of the lung has been cut to reveal the accessory lobe (5) of the right lung. The ventral part of the accessory lobe is hidden in a pocket formed by **plica vena cava** (6), which extends between the mediastinum (7) and the caudal vena cava (8). Also notice the heart (9), cranial vena cava (10), thymus (11), and phrenic n. (12).

<http://vanat.cvm.umn.edu/carnLabs/Lab11/Lab11.html>



This is the same as the previous image except that the accessory lobe (7) of the right lung is reflected. The two lungs are placed on a surface with medial sides up and dorsal borders facing one another, cranial is at the bottom. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory (7) lobes.

Ca.

6. Incisura cardiaca dext.
10. Incisura cardiaca sin.
12. Impressio aortica
13. Impressio oesophagea
14. Sulcus venae caevae
16. Facies diaphragmatica

LUNGE (PULMO)

FACIES MEDIASTINALIS

5. LUNGENHILUS (HILUS PULMONIS):

- Bronchus principalis dext. et sin.
- A. et V. pulmonalis
- A. et V. bronchialis
- Lymphgefäße
- Nerven übertreten in die Lunge

**Bildung
der
Radix pulmonis**

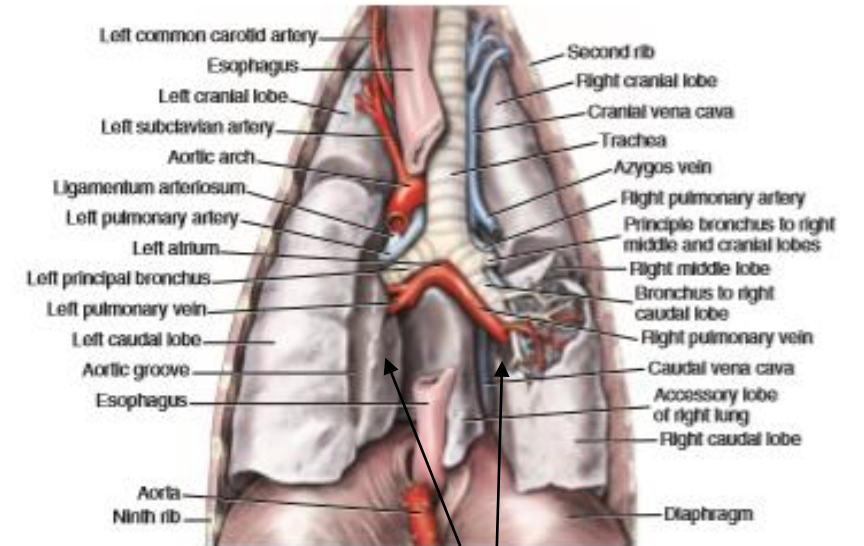
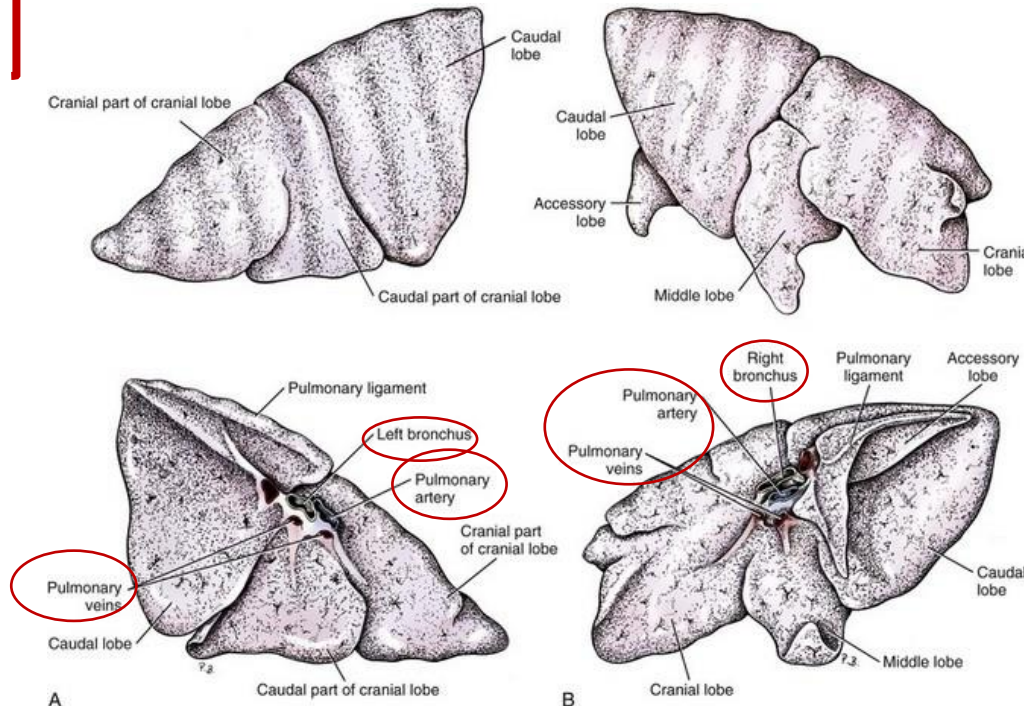


FIGURE 8-23 Bronchial tree and associated structures, dorsal aspect.

Ca

Facies mediastinalis

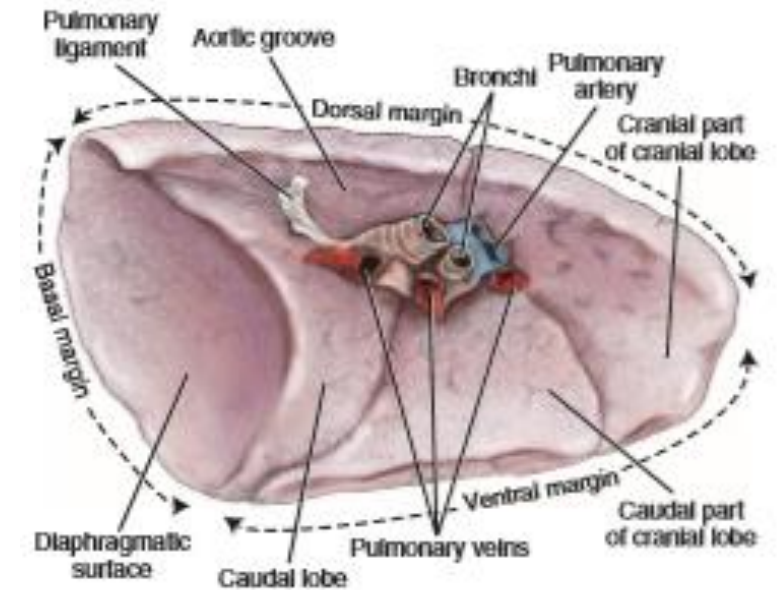


FIGURE 8-35 Margins and surfaces of the left lung, medial view.

LUNGE (PULMO)

FACIES DIAPHRAGMATICA

- dem Zwerchfell aufliegt
- der Zwerchfellwölbung entsprechend ausgehöhlt

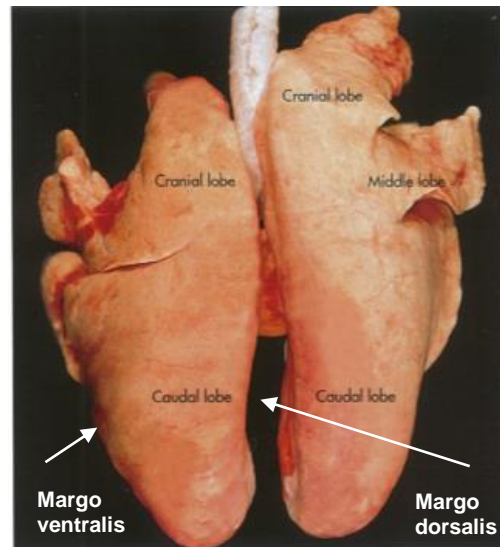


Fig. 8-31. Lungs of a pig, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

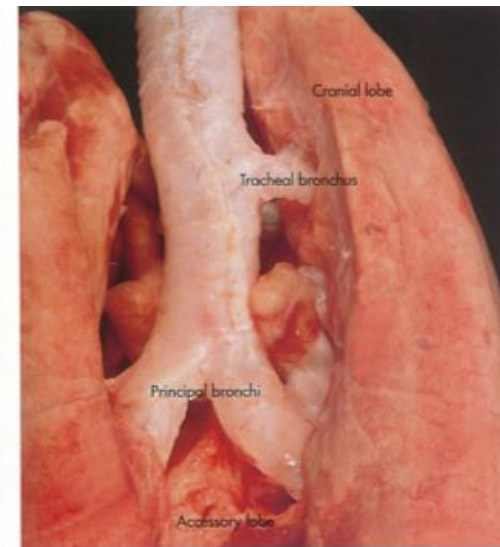


Fig. 8-32. Lungs of a pig, demonstrating the tracheal bronchus, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

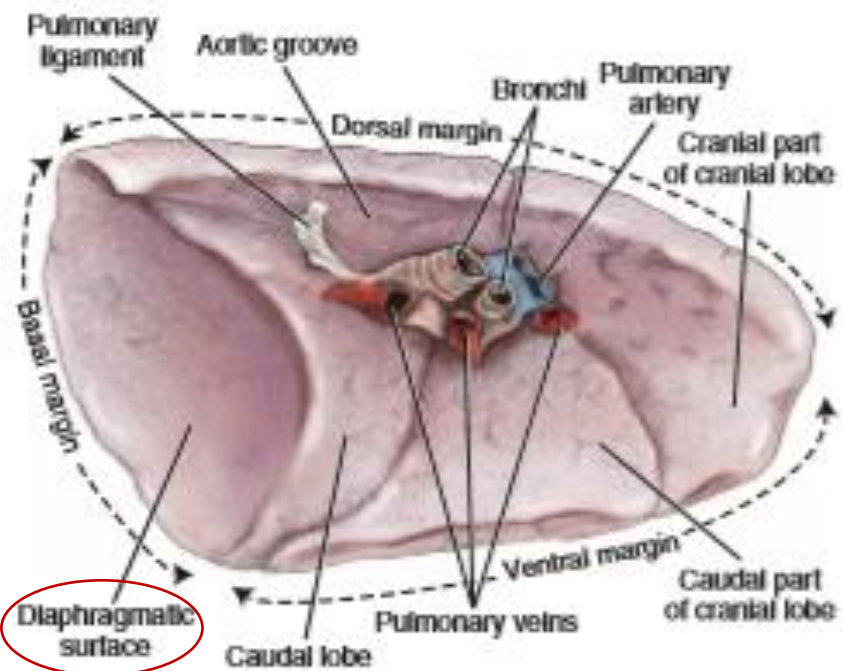
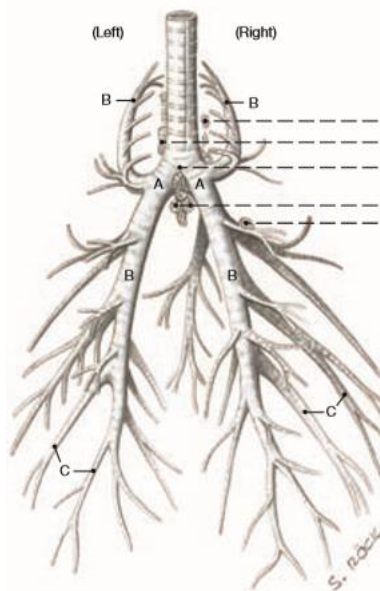
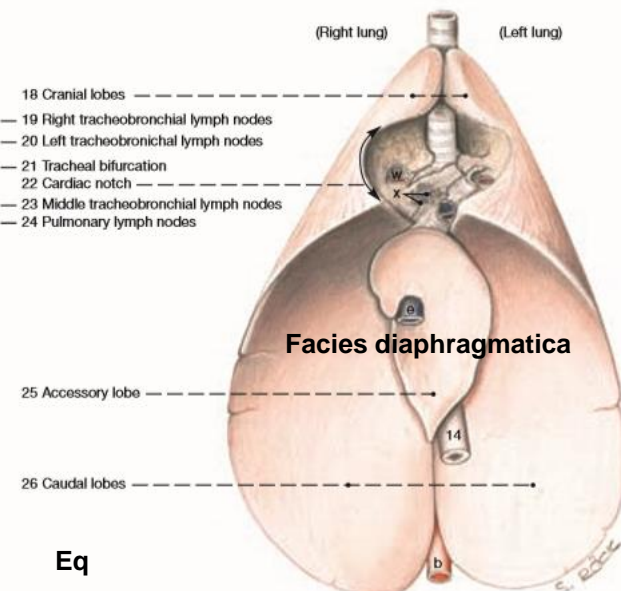


FIGURE 8-35 Margins and surfaces of the left lung, medial view.

Bronchial Tree, dorsal view



Lungs, ventral view



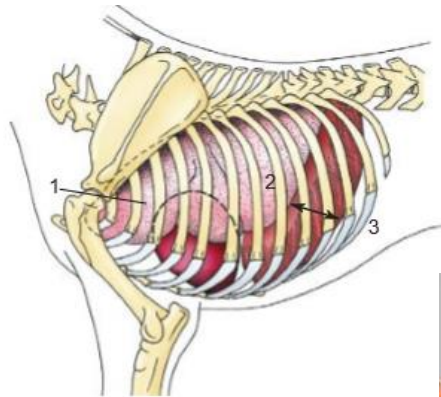
Eq

LUNGE (PULMO)

FACIES DIAPHRAGMATICA:

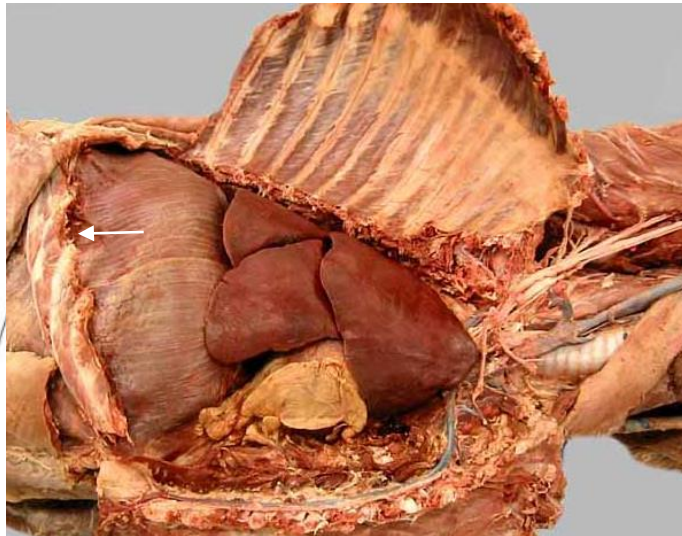
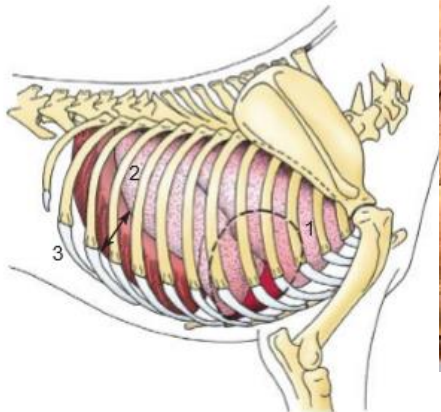
RECESSUS COSTODIAPHRAGMATICUS:

- Pleuraspalt zwischen Zwerchfell und der äußeren Brustwand
- Margo ventralis verschiebt sich bei der Atmung ohne dass der Pleuraspalt bei der Inspiration voll entfaltet wird

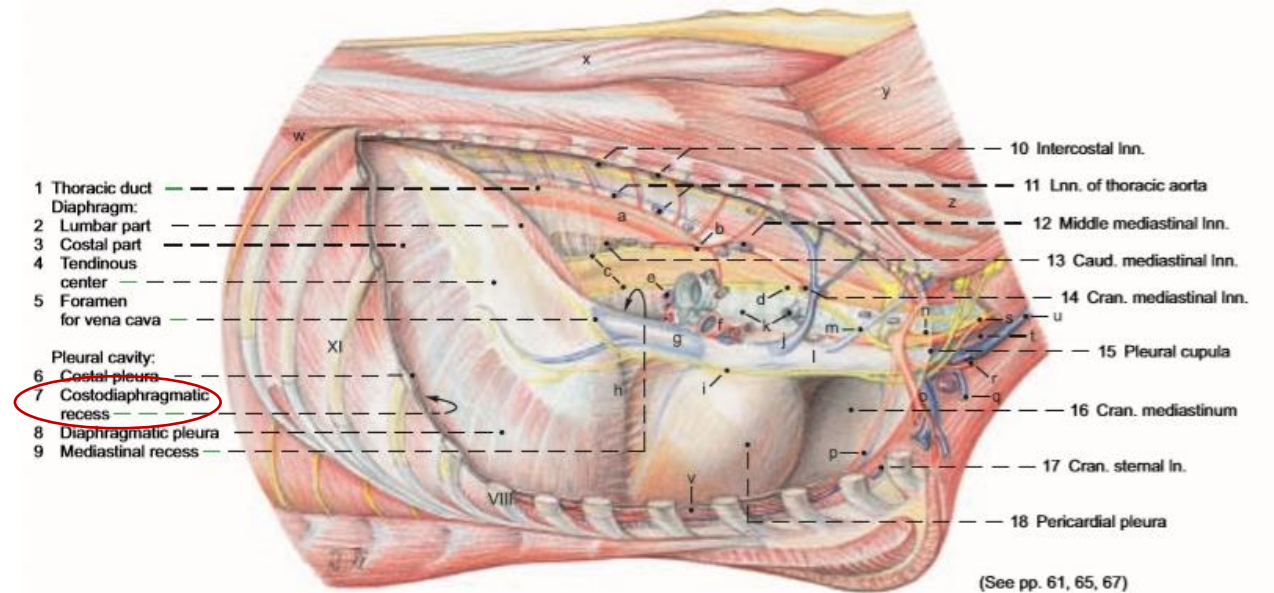


1. Cranial lobe
2. Caudal lobe
3. Costodiaphragmatic recess (arrow)

Note: The outline of the heart is indicated (broken line).



<http://vanat.cvm.umn.edu/carnLabs/Lab11/Img11-1.html>



- 1 Thoracic duct
- Diaphragm:
 - 2 Lumbar part
 - 3 Costal part
 - 4 Tendinous center
 - 5 Foramen for vena cava
- Pleural cavity:
 - 6 Costal pleura
 - 7 Costodiaphragmatic recess
 - 8 Diaphragmatic pleura
 - 9 Mediastinal recess
- 10 Intercostal Inn.
- 11 Lnn. of thoracic aorta
- 12 Middle mediastinal Inn.
- 13 Caud. mediastinal Inn.
- 14 Cran. mediastinal Inn.
- 15 Pleural cupula
- 16 Cran. mediastinum
- 17 Cran. sternal In.
- 18 Pericardial pleura

Legend:

- | | | | | |
|--------------------------------|---------------------|---------------------------------|---|--|
| A Main bronchus | d Right vagus n. | j Right azygos v. | p Internal thoracic a. and v. | v Transverse thoracic m. |
| B Lobar bronchus | e Pulmonary vv. | k Trachea and tracheal bronchus | q Cephalic v. | w Retractor costae |
| C Segmental bronchus | f Pulmonary a. | l Cran. vena cava | r Supf. cervical a. and v. | x Spinalis et semispinalis cervicis et capitis |
| a Thoracic aorta | g Caud. vena cava | m Costocervical v. | s Vagosympathetic trunk | y Semispinalis capitis |
| b Bronchoesophageal a. | h Plica venae cavae | n Right recurrent laryngeal n. | t Common carotid a. and internal jugular v. | z Longissimus cervicis |
| c Dors. and vent. vagal trunks | i Phrenic n. | o Right subclavian a. and v. | u External jugular v. | |

LUNGE (PULMO)

KANTEN DER LUNGE:

1. MARGO DORSALIS seu OBTUSUS: stumpf
2. MARGO VENTRALIS seu ACUTUS: scharf
3. MARGO BASALIS

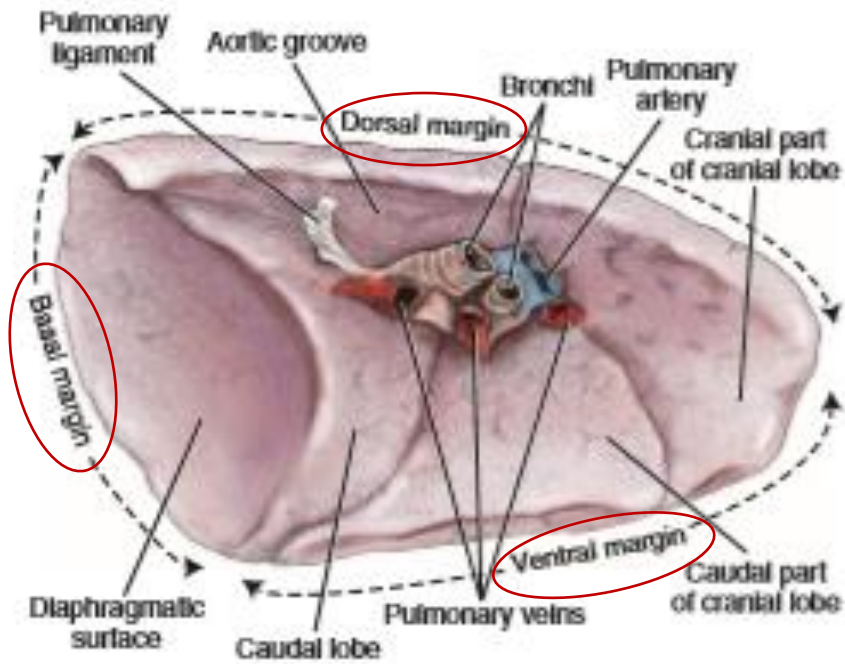


FIGURE 8-35 Margins and surfaces of the left lung, medial view.

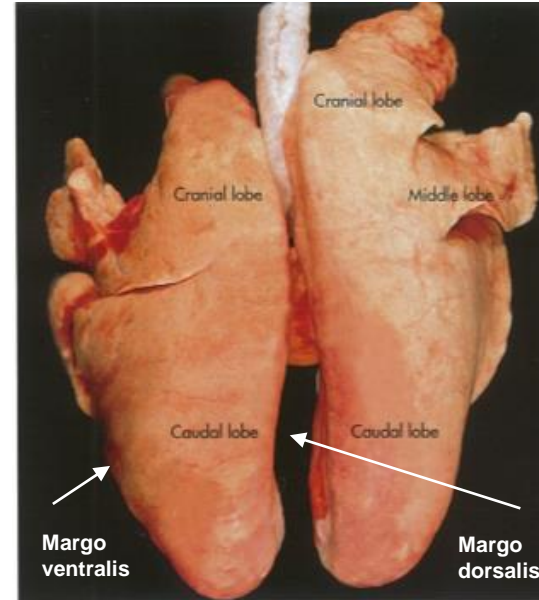


Fig. 8-31. Lungs of a pig, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

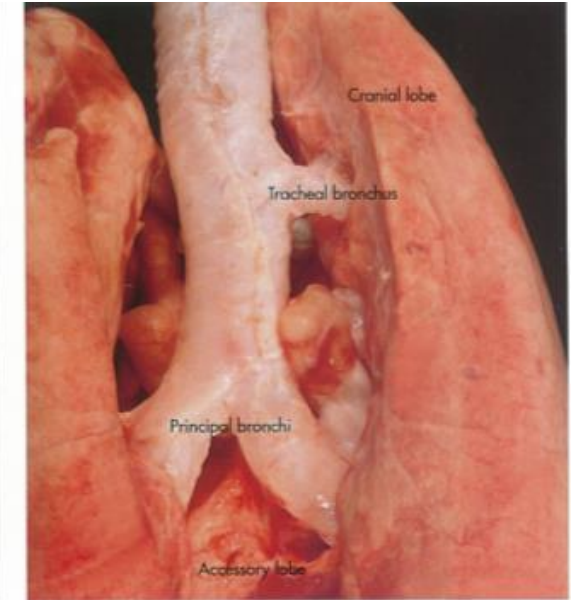
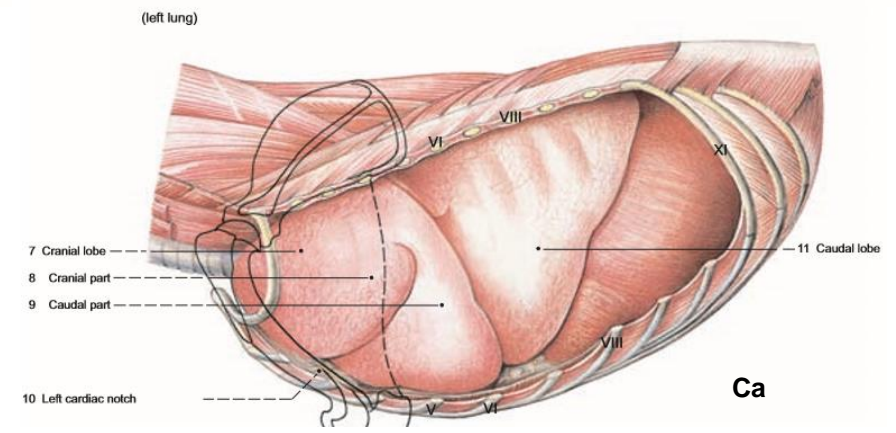
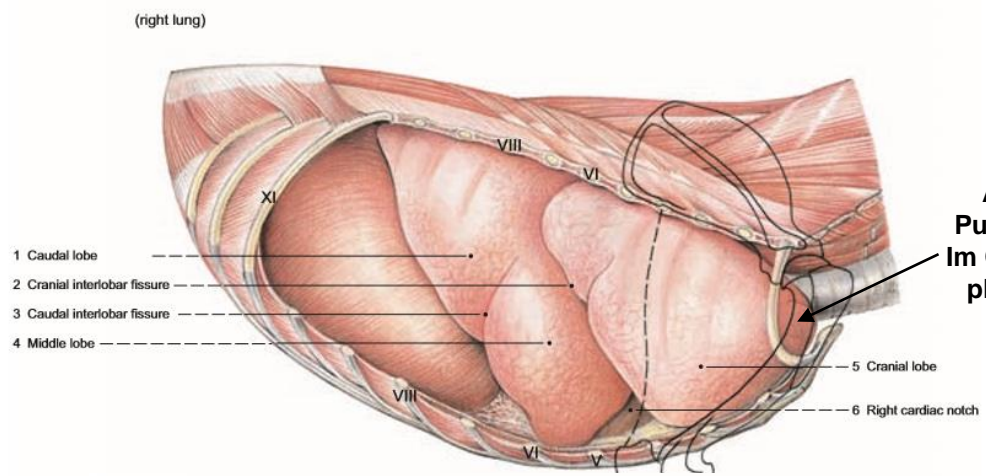
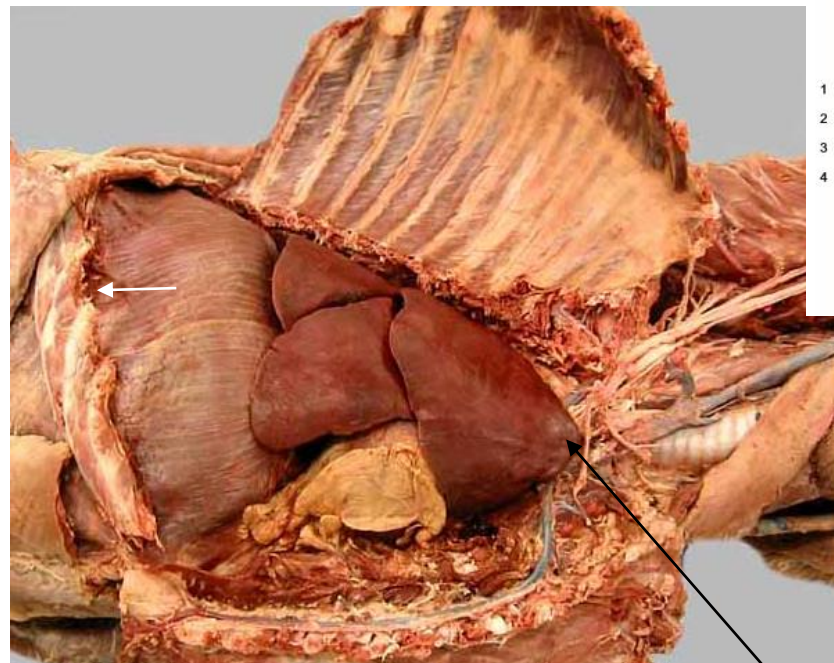
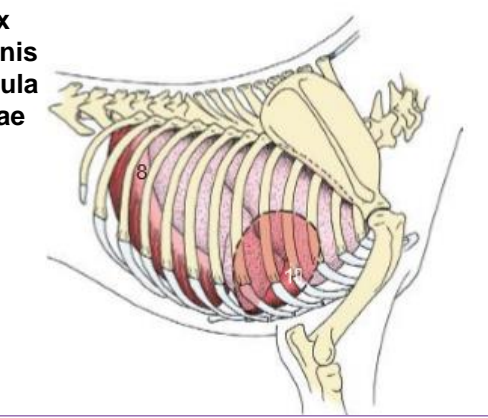
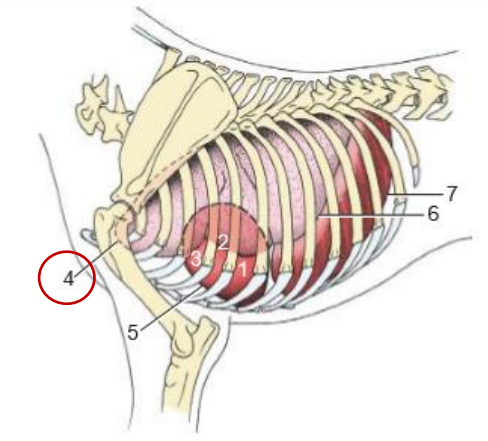


Fig. 8-32. Lungs of a pig, demonstrating the tracheal bronchus, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

LUNGE (PULMO)

APEX PULMONIS:

- kraniale Spitze
- kranial schiebt sich mit dem Cupula pleurae durch die Apertura thoracis cranialis wenige Fingerbreit in den Hals



Apex Pulmonis Im Cupula pleurae

1. Left atrioventricular valve
- 1'. Right atrioventricular valve
2. Aortic valve
3. Pulmonary valve
4. Apex of left lung (broken line) in cupula pleurae
5. Heart
6. Basal border of the lung
7. Line of pleural reflection
8. Diaphragm

Note: Puncta maxima of the left atrioventricular valve.

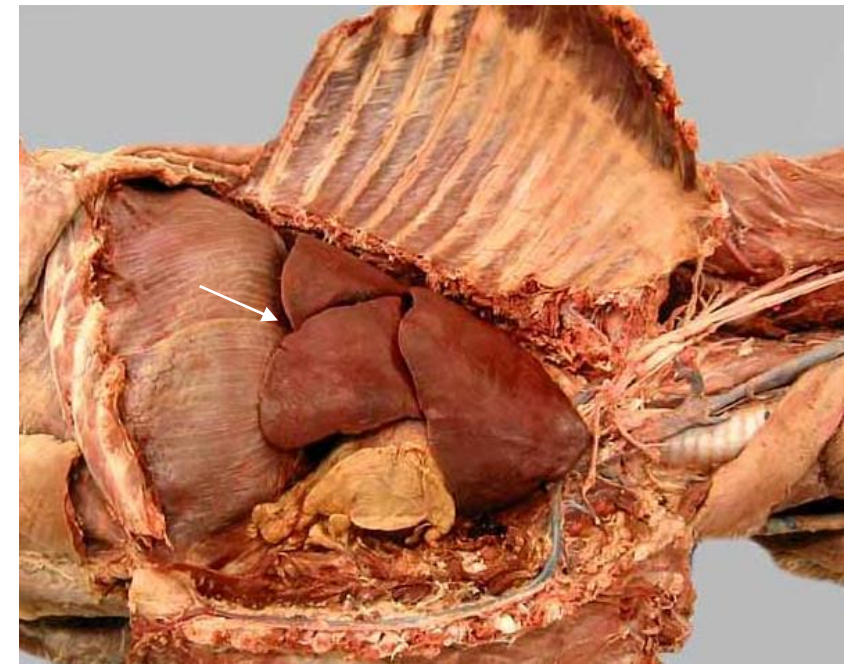
<http://vanat.cvm.umn.edu/carnLabs/Lab11/Img11-1.html>

Apex pulmonis

LUNGE (PULMO)

BASIS PULMONIS:

- **Facies diaphragmatica**



<http://vanat.cvm.umn.edu/carnLabs/Lab11/Img11-1.html>

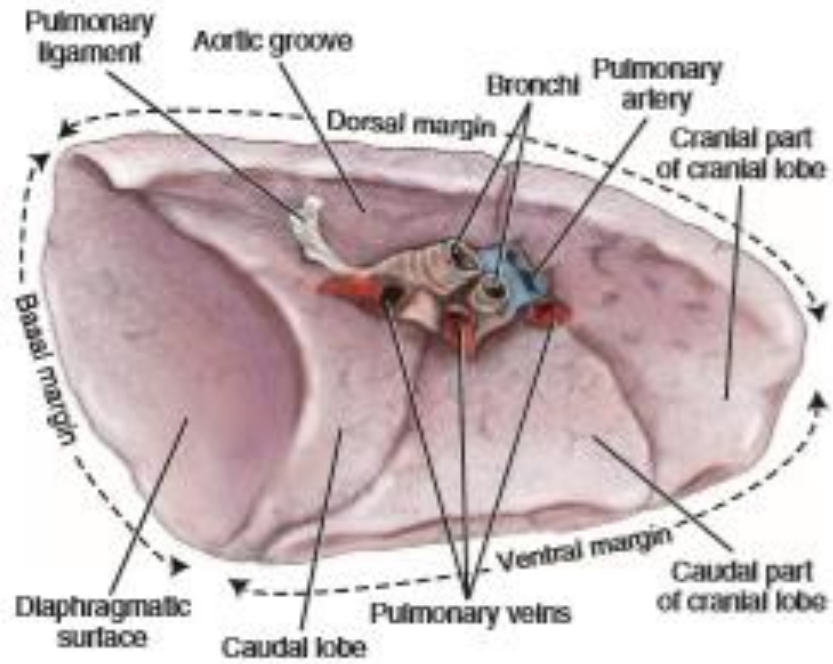
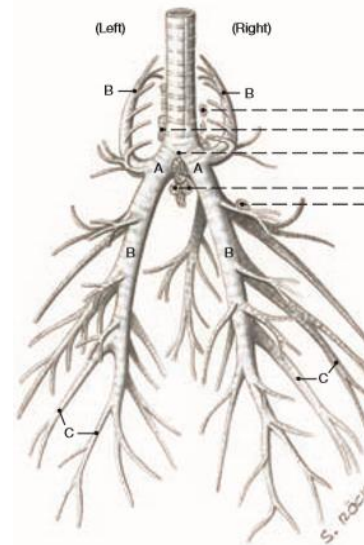
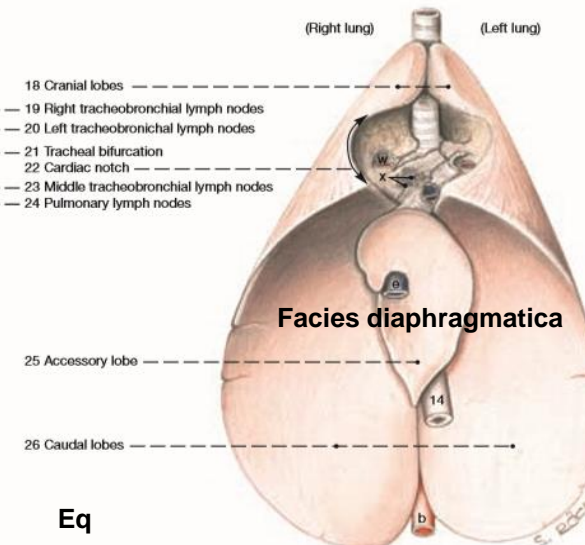


FIGURE 8-35 Margins and surfaces of the left lung, medial view.

Bronchial Tree, dorsal view



Lungs, ventral view

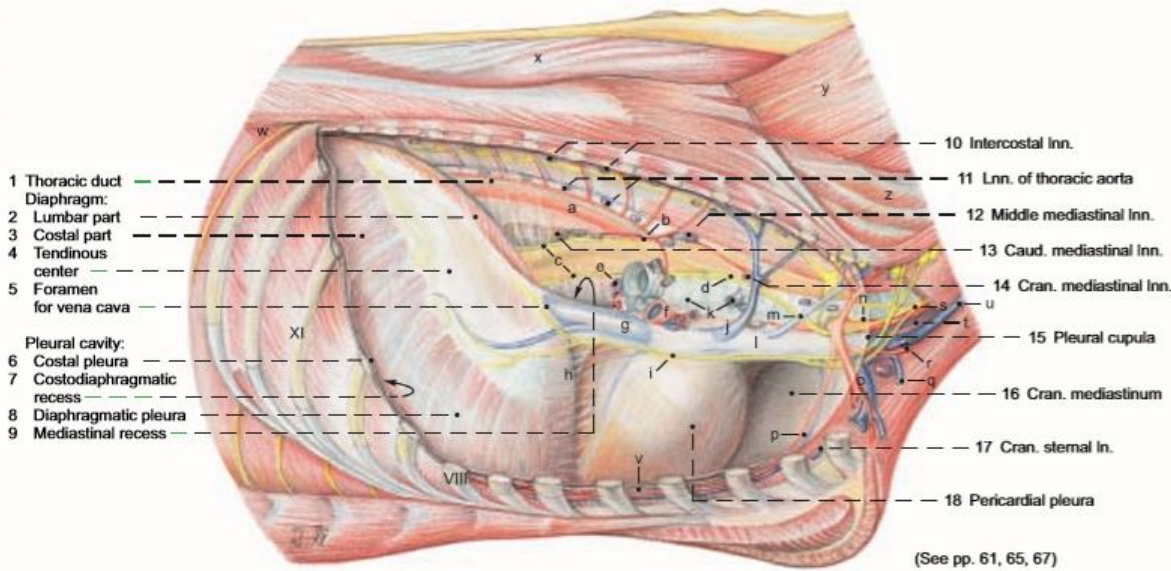


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BEFESTIGUNG DER LUNGE

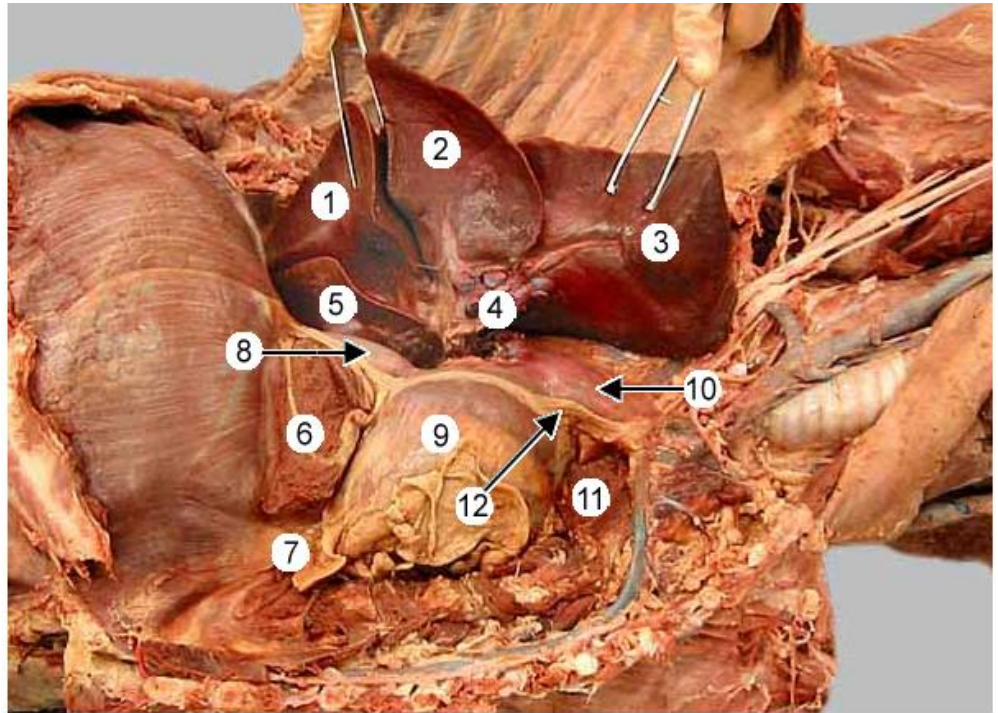
erfolgt über:

1. die Trachea
2. das Mediastinum
3. die Blutgefäße – A. pulmonalis, Aorta, Vv. Pulmonalis
4. Ligamentum pulmonale (Pleurafalte)
5. Radix pulmonis (Lungenwurzel)



Legend:

- | | | | | |
|--------------------------------|---------------------|---------------------------------|---|--|
| A Main bronchus | d Right vagus n. | j Right azygos v. | p Internal thoracic a. and v. | v Transverse thoracic m. |
| B Lobar bronchus | e Pulmonary vv. | k Trachea and tracheal bronchus | q Cephalic v. | w Retractor costae |
| C Segmental bronchus | f Pulmonary a. | l Cran. vena cava | r Supf. cervical a. and v. | x Spinalis et semispinalis cervicis et capitis |
| a Thoracic aorta | g Caud. vena cava | m Costocervical v. | s Vagosympathetic trunk | y Semispinalis capitis |
| b Bronchoesophageal a. | h Plica venae cavae | n Right recurrent laryngeal n. | t Common carotid a. and internal jugular v. | z Longissimus cervicis |
| c Dors. and vent. vagal trunks | i Phrenic n. | o Right subclavian a. and v. | u External jugular v. | |

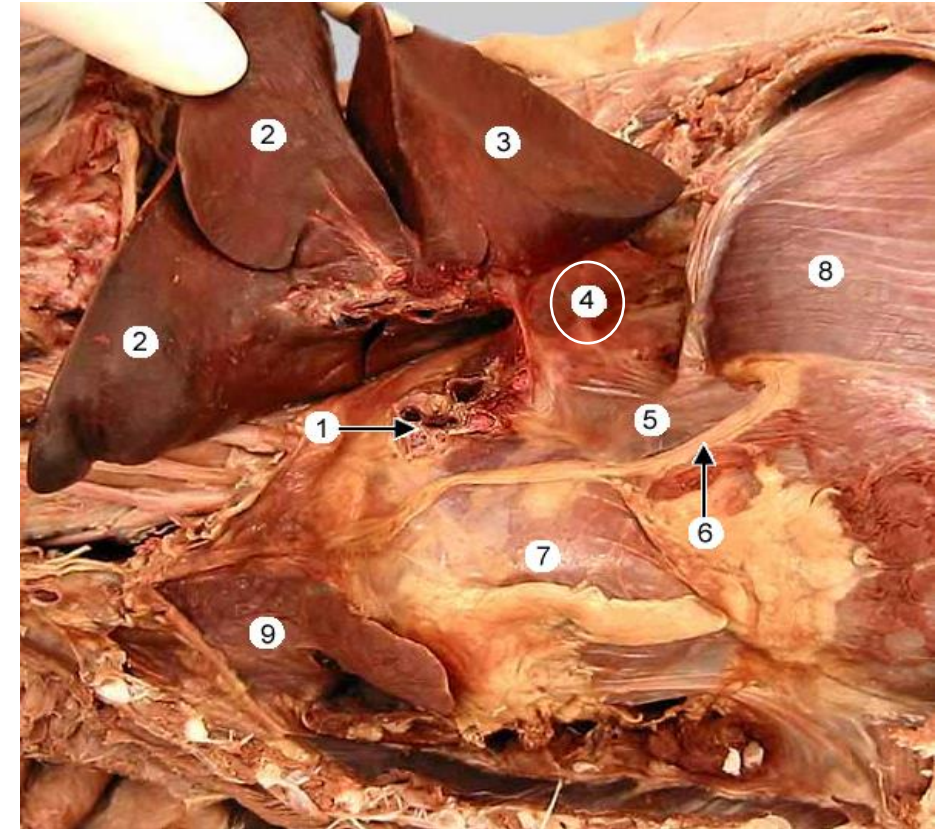


Caudal (1), middle (2), and cranial (3) lobes of the **right lung** are elevated and the root (4) of the lung has been cut to reveal the accessory lobe (5) of the right lung. The ventral part of the accessory lobe is hidden in a pocket formed by **plica vena cava** (6), which extends between the mediastinum (7) and the caudal vena cava (8). Also notice the heart (9), cranial vena cava (10), thymus (11), and phrenic n. (12).

BEFESTIGUNG DER LUNGE

Ligamentum pulmonale (Pleurfalte):

- dorsomedial der Lunge mit dem Mediastinum, mit dem Zwerchfell verbindet



On the left side, the root of the lung (1) has been cut and the lung is reflected. The **left lung** is composed of a cranial lobe (2) with cranial and caudal parts and a caudal (3) lobe. The lung is covered by **visceral (pulmonary) pleura**. The **pulmonary ligament** (4), connects between visceral pleura and mediastinal parietal pleura (5). The **phrenic nerve** (6) crosses the surface of the heart (7) on its way to innervate the diaphragm (8). The thymus (9) is situated in the mediastinum cranial to the heart.

BEFESTIGUNG DER LUNGE

RADIX PULMONIS (LUNGENWURZEL):

1. die Eintrittsstelle des Hauptbronchus (Bronchus principalis dext. et sin.)
2. A. pulmonalis (Truncus pulmonalis)
3. V. pulmonalis
4. A. bronchialis (Aorta thoracica)
5. V. bronchialis
6. Lymphgefäße
7. Nerven

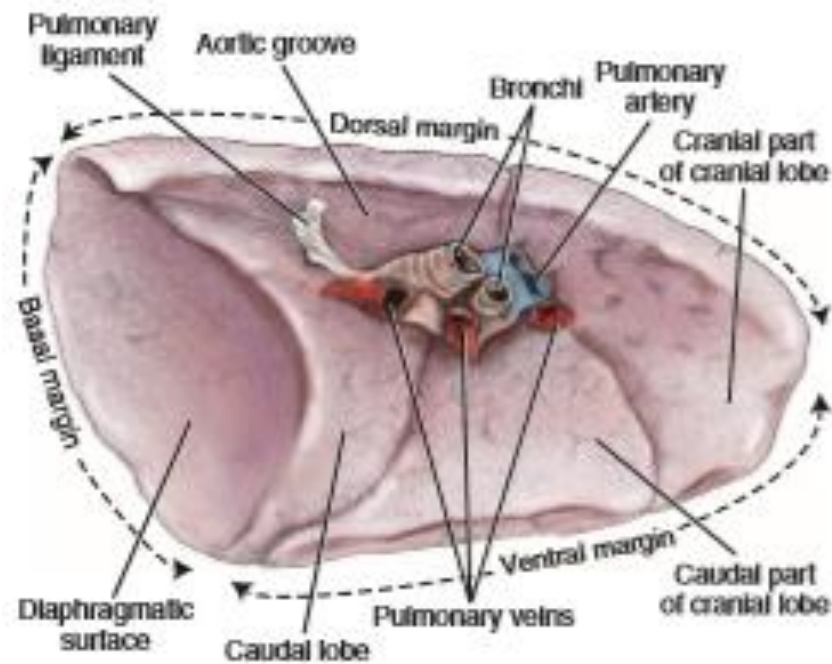


FIGURE 8-35 Margins and surfaces of the left lung, medial view.

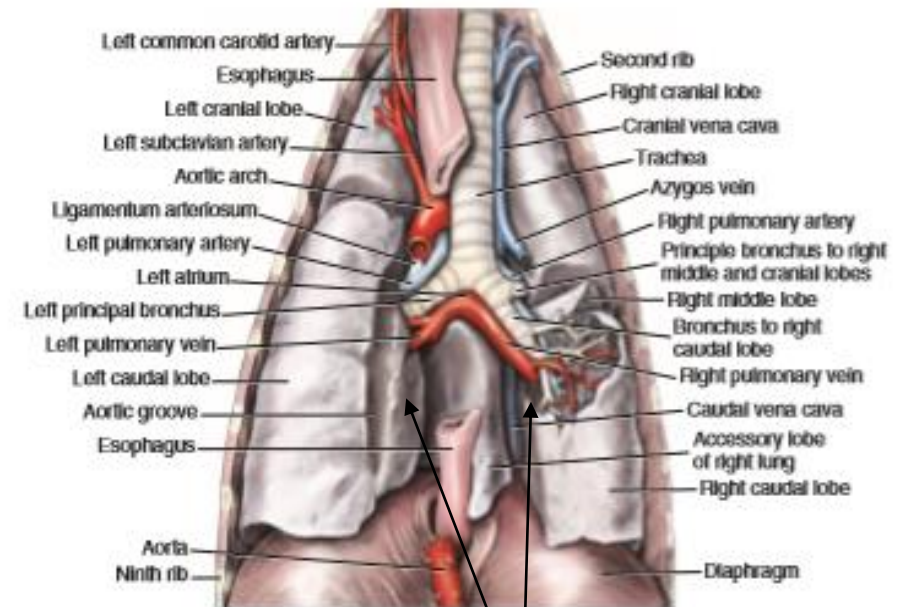
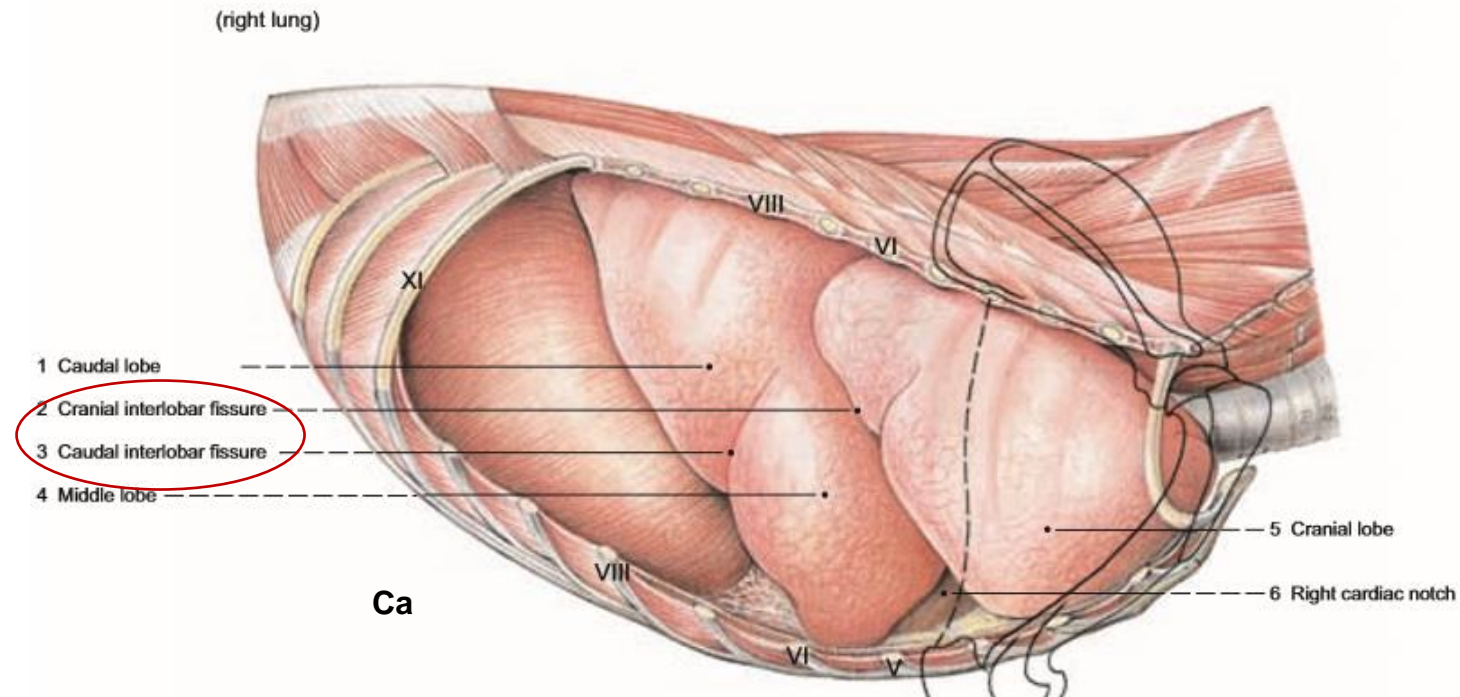


FIGURE 8-23 Bronchial tree and associated structures, dorsal aspect.

Ca
Facies mediastinalis

LUNGENLAPPEN (LOBI PULMONIS)

- sind tierartlich unterschiedlich ausgebildet
- Fissurae interlobares (Abgrenzung der Lappen)
- die Aufzweigung des Bronchialbaums bildet die Grundlage zur Benennung der Lungenlappen



LUNGENLAPPEN (LOBI PULMONIS)

LINKE LUNGE

1. Lobus cranialis
2. Lobus caudalis

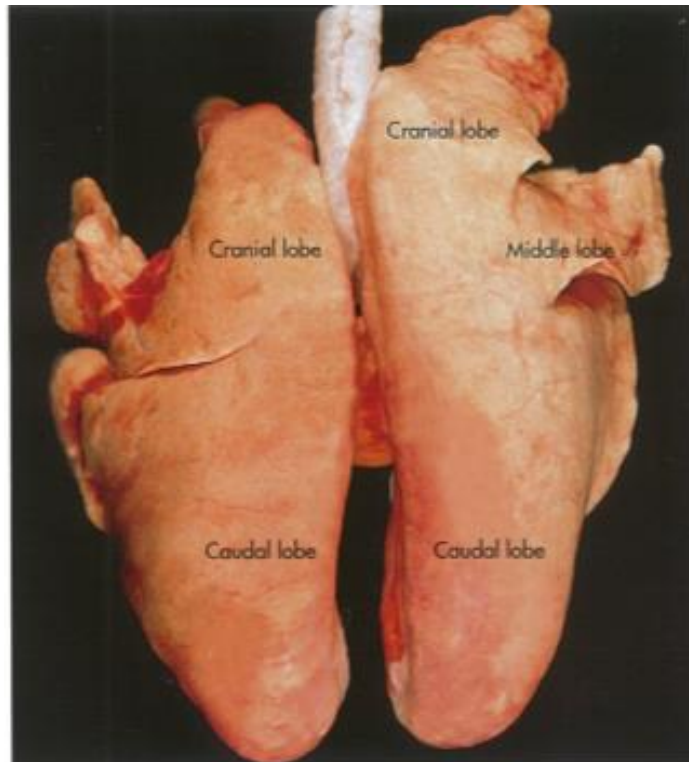
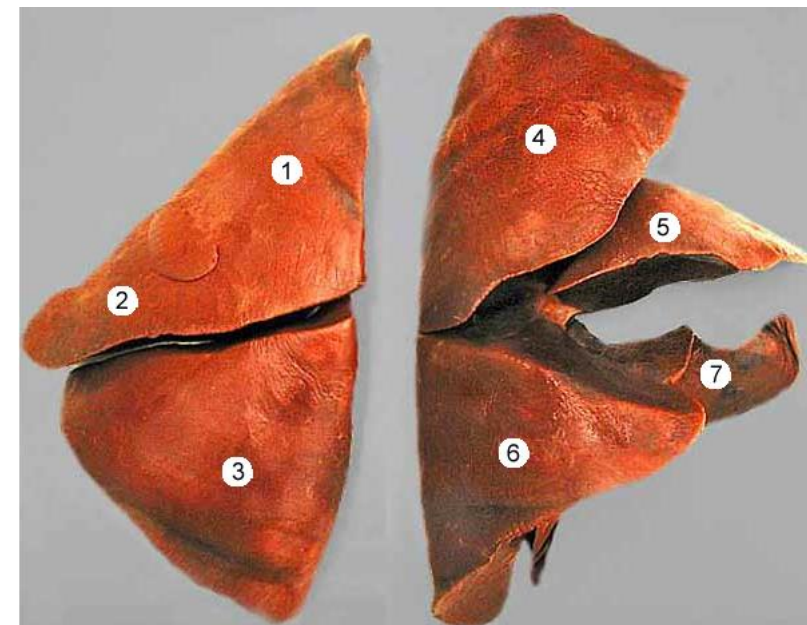
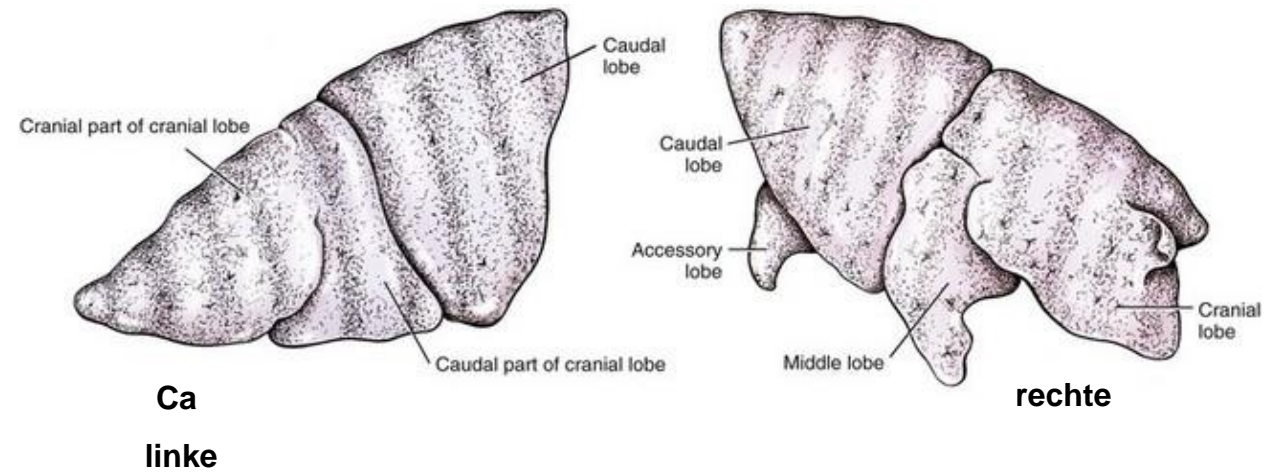


Fig. 8-31. Lungs of a pig, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).



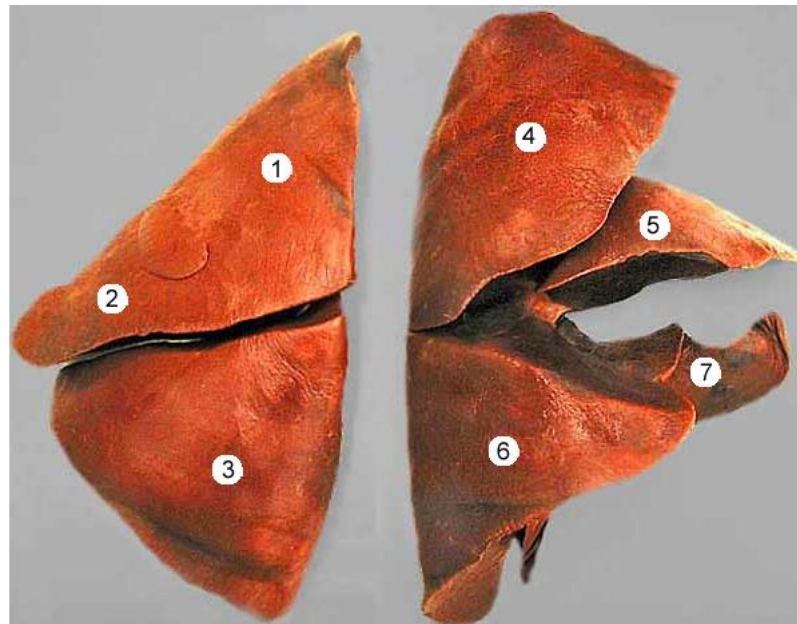
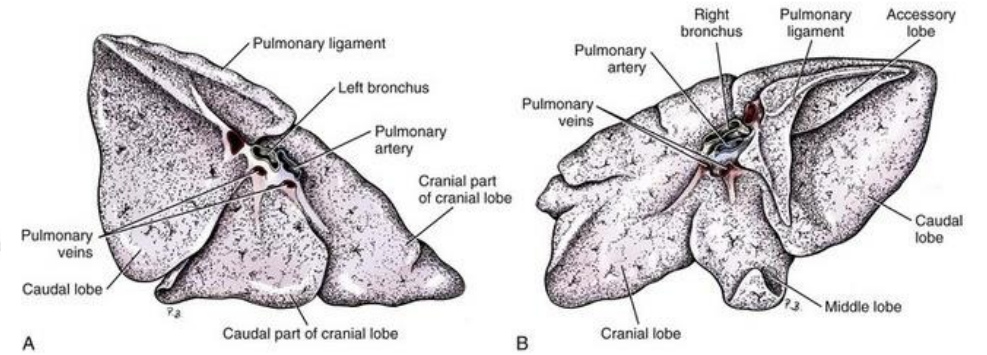
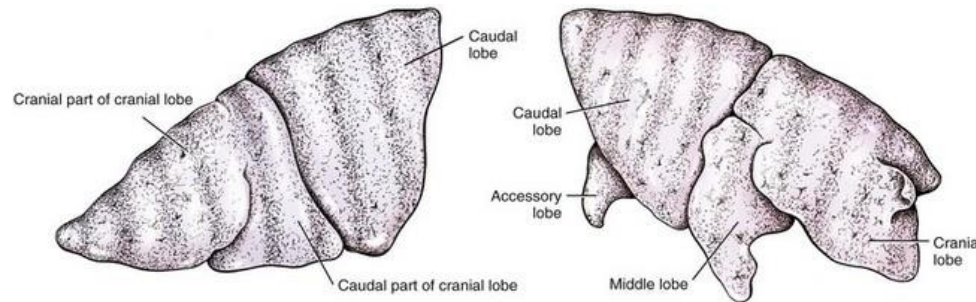
The two lungs are placed on a surface with lateral sides up and dorsal borders facing one another, cranial is at the top. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory (7) lobes.

<http://vanat.cvm.umn.edu/carnLabs/Lab11/lmg11-4.html>

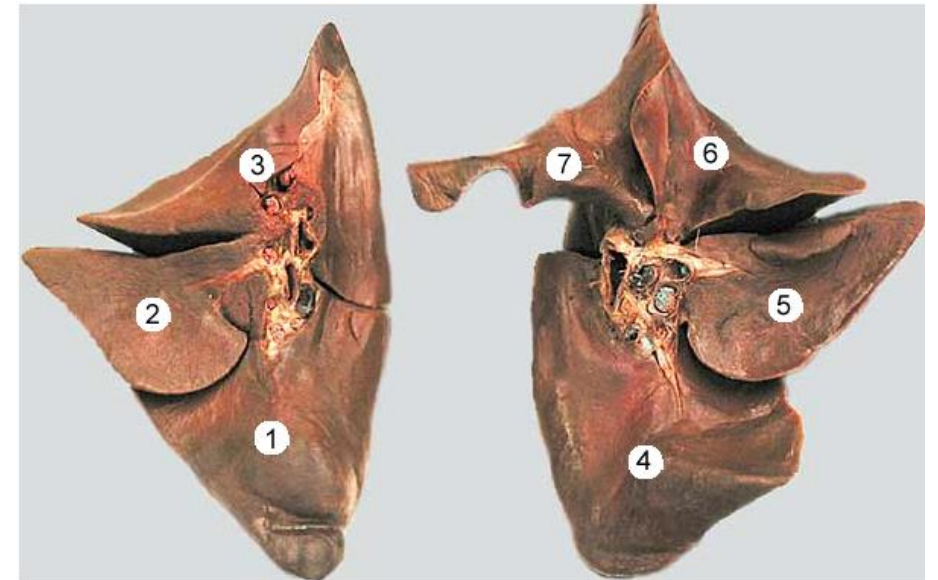
LUNGENLAPPEN (LOBI PULMONIS)

RECHTE LUNGE

1. Lobus cranialis
2. Lobus medius
3. Lobus caudalis
4. Lobus accessorius



The two lungs are placed on a surface with lateral sides up and dorsal borders facing one another, cranial is at the top. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory(7) lobes.



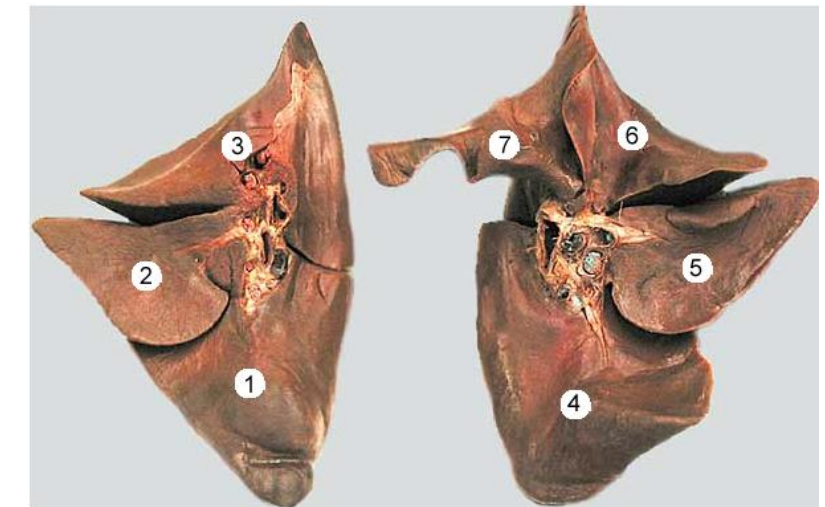
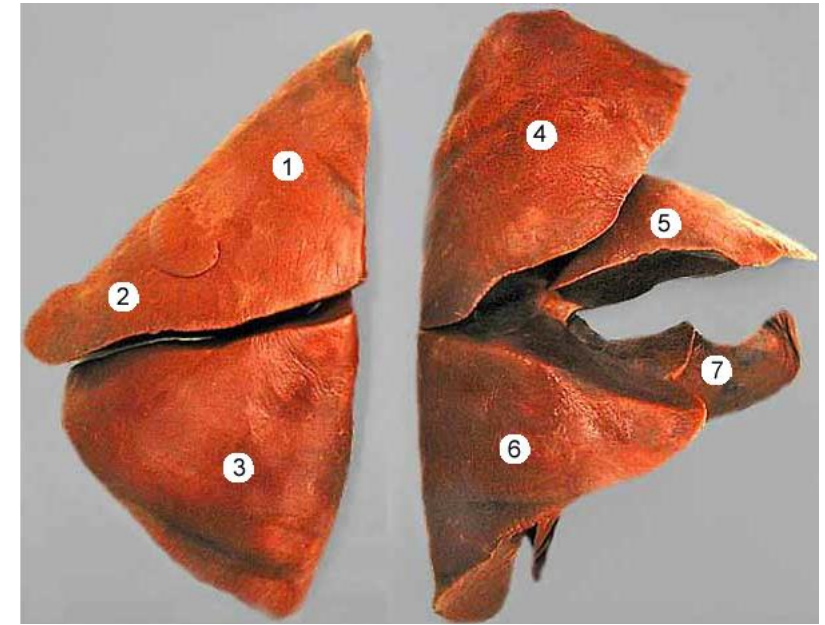
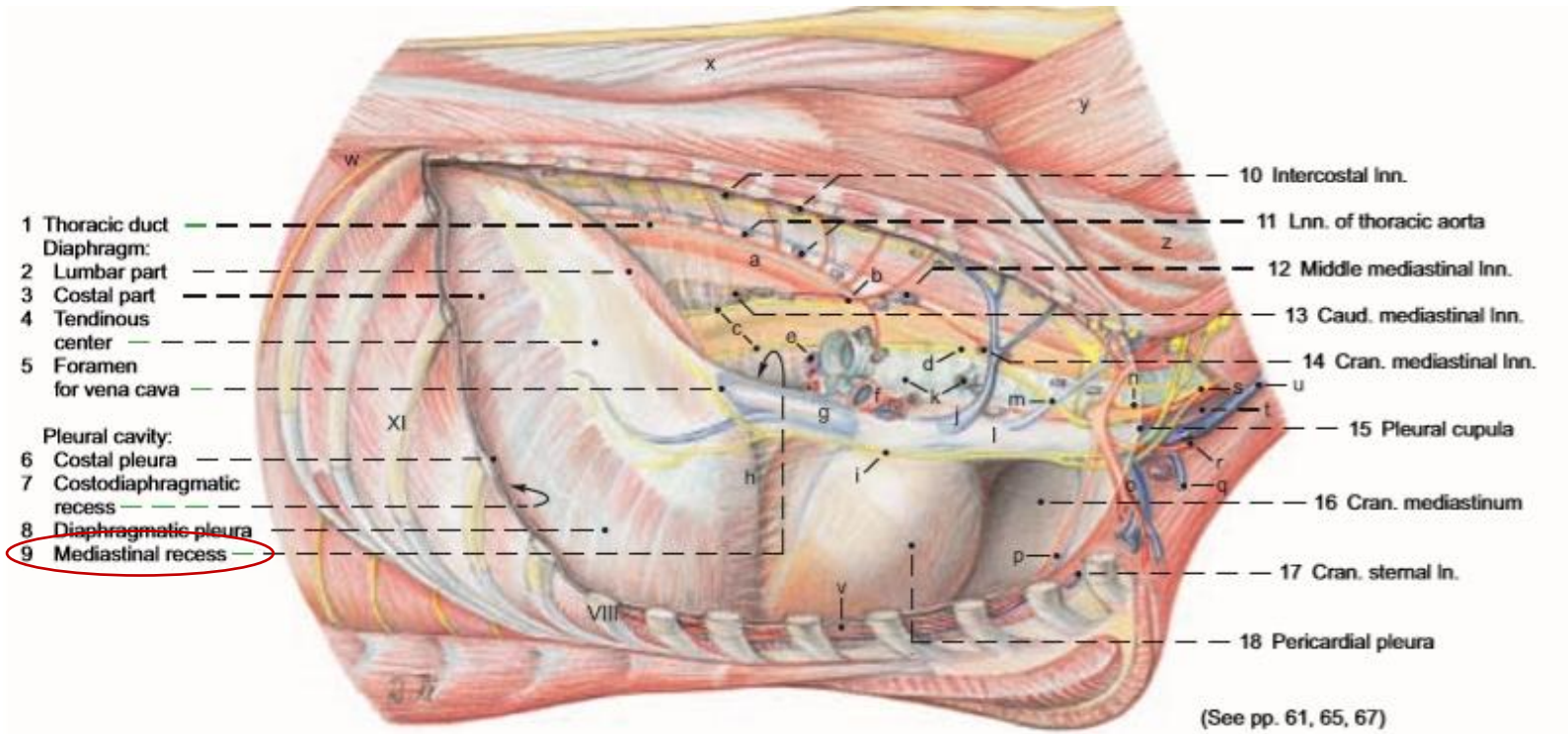
This is the same as the previous image except that the accessory lobe (7) of the right lung is reflected. The two lungs are placed on a surface with medial sides up and dorsal borders facing one another, cranial is at the bottom. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory(7) lobes.

LUNGENLAPPEN (LOBI PULMONIS)

RECHTE LUNGE

Lobus accessorius:

- zum Bronchus accessorius
- im Recessus mediastini eingebettet ist

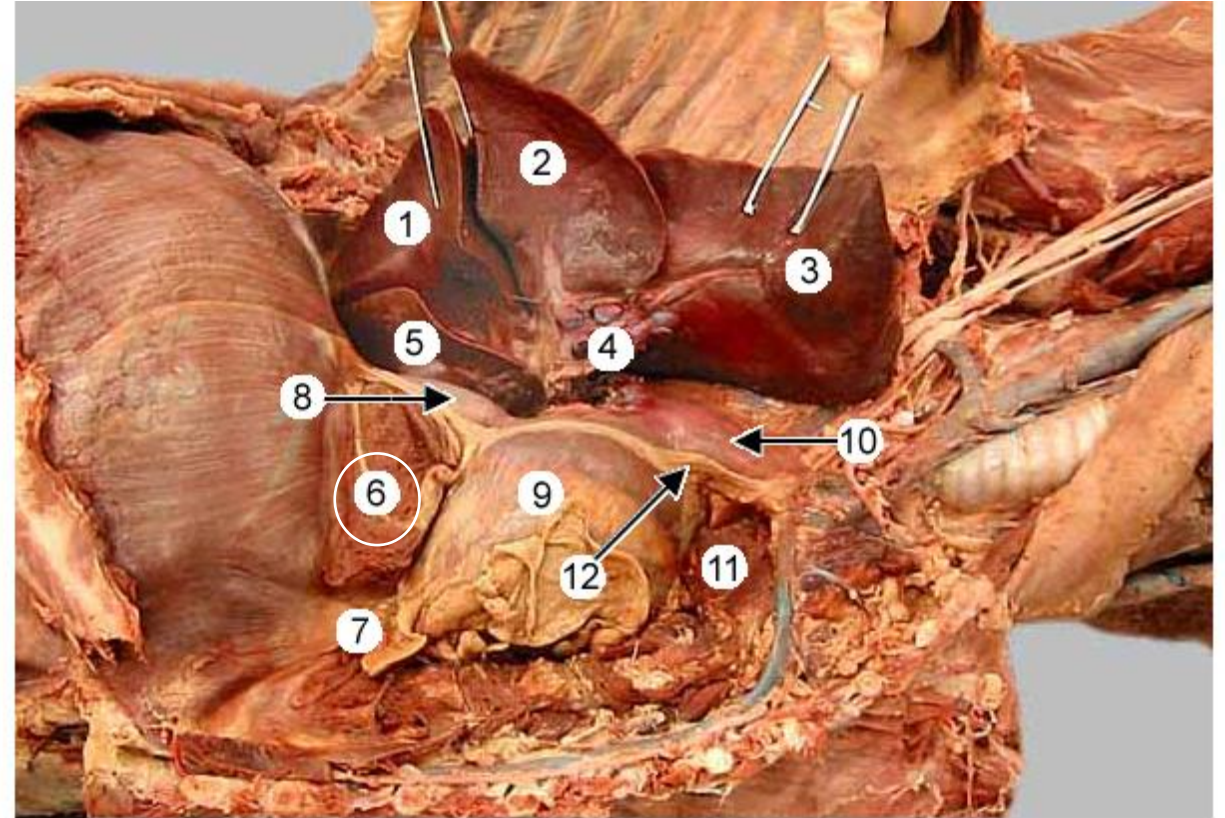


This is the same as the previous image except that the accessory lobe (7) of the right lung is reflected. The two lungs are placed on a surface with medial sides up and dorsal borders facing one another, cranial is at the bottom. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory(7) lobes.

LUNGENLAPPEN (LOBI PULMONIS)

RECESSUS MEDIASTINI liegt zwischen:

- a. dem Mediastinum (links)
 - b. der V. cava caudalis mit ihrem Gekröse – Plica venae cavae (rechts)
 - c. dem Herzbeutel (kranial)
 - d. dem Diaphragma (kaudal)
- Lobus accessorius
 - beim Schwein, Hund, Katze:
 - ein Teil des Lobus accessorius außerhalb des Recessus gelagert



Caudal (1), middle (2), and cranial (3) lobes of the **right lung** are elevated and the root (4) of the lung has been cut to reveal the accessory lobe (5) of the right lung. The ventral part of the accessory lobe is hidden in a pocket formed by **plica venae cavae** (6), which extends between the mediastinum (7) and the caudal vena cava (8). Also notice the heart (9), cranial vena cava (10), thymus (11), and phrenic n. (12).

LUNGENLAPPEN (LOBI PULMONIS)

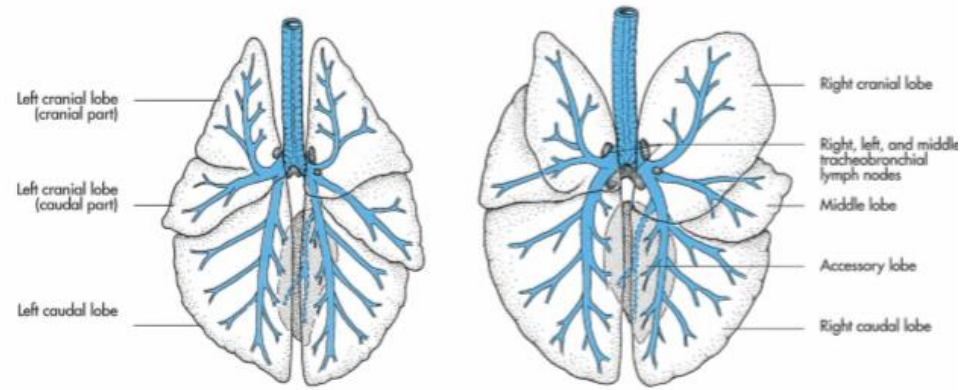
FLEISCHFRESSER:

LINKE LUNGE:

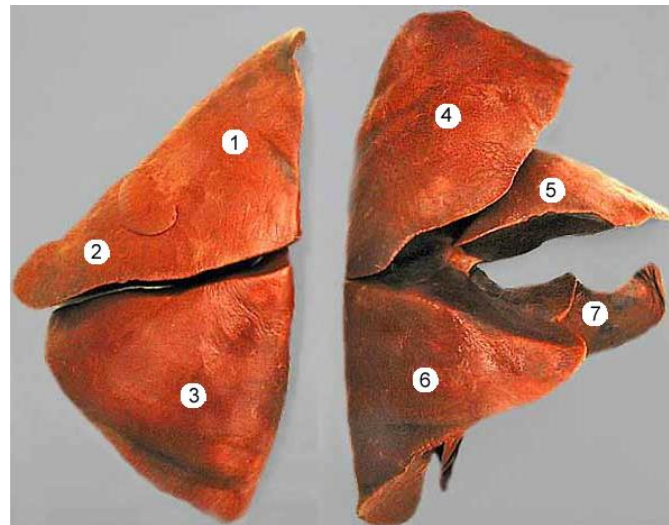
1. Lobus cranialis sinister Pars cranialis
2. Lobus cranialis sinister Pars caudalis
3. Lobus caudalis sinister

RECHTE LUNGE:

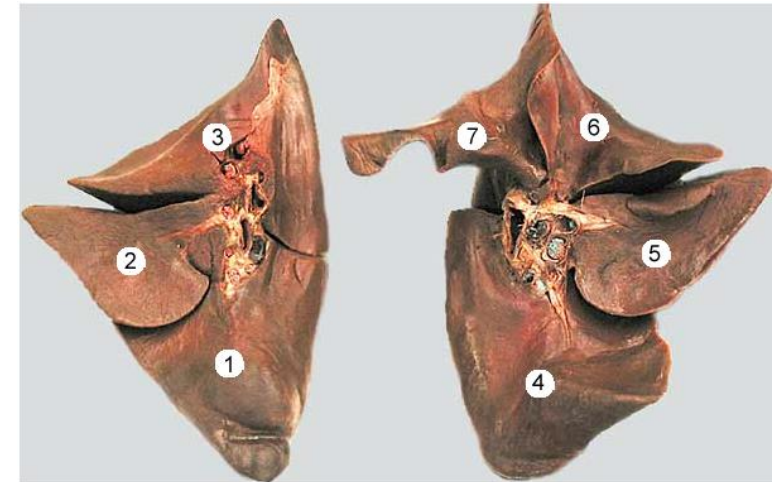
1. Lobus cranialis dexter
2. Lobus medius
3. Lobus caudalis dexter
4. Lobus accessorius



8-26. Lung lobes, bronchial tree and lymphnodes of the cat (left) and the dog (right), dorsal aspect, schematic (Ghetie, 1958).



The two lungs are placed on a surface with lateral sides up and dorsal borders facing one another, cranial is at the top. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory(7) lobes.



This is the same as the previous image except that the accessory lobe (7) of the right lung is reflected. The two lungs are placed on a surface with medial sides up and dorsal borders facing one another, cranial is at the bottom. *Left:* The **left lung** is composed of a cranial lobe that has cranial (1) and caudal (2) parts and a caudal (3) lobe. *Right:* The **right lung** has cranial (4), middle (5), caudal (6), and accessory(7) lobes.

LUNGENLAPPEN (LOBI PULMONIS)

SCHWEIN:

LINKE LUNGE:

1. Lobus cranialis sinister Pars cranialis
2. Lobus cranialis sinister Pars caudalis
3. Lobus caudalis sinister

RECHTE LUNGE:

1. Lobus cranialis dexter
2. Lobus medius
3. Lobus caudalis dexter
4. Lobus accessorius

1. Right cranial lobe
2. Right middle lobe
3. Right caudal lobe
4. Accessory lobe of right lung
5. Divided left cranial lobe
6. Trachea
7. Tracheal bronchus
8. Right cardiac notch
9. Basal border

Note: Dorsal view.

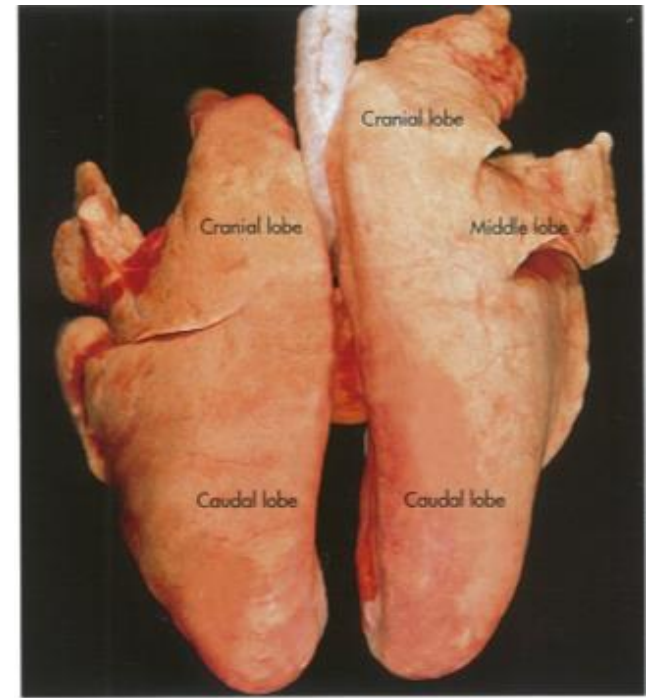
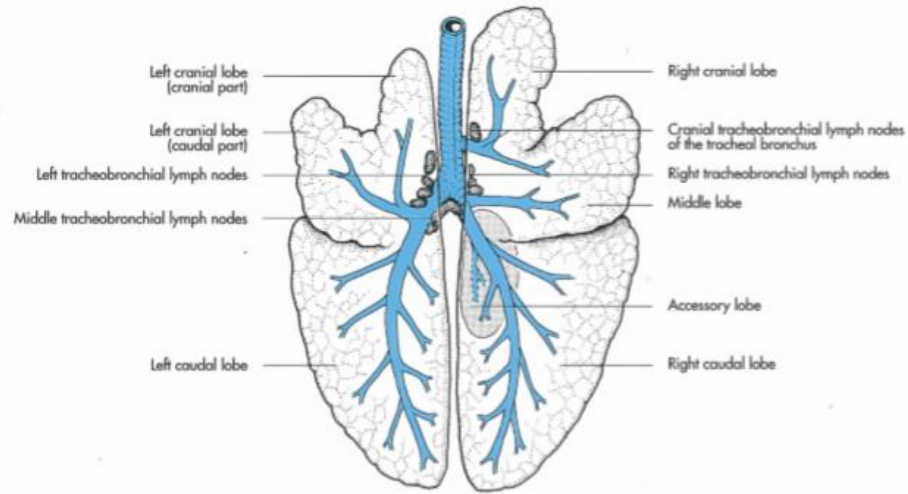
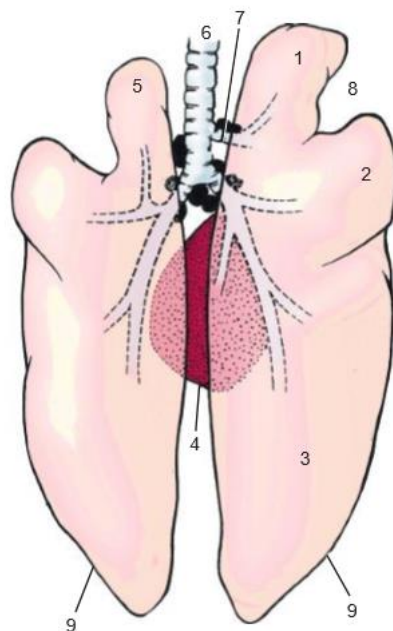


Fig. 8-31. Lungs of a pig, dorsal aspect (courtesy of PD Dr. J. Maierl),



LUNGENLAPPEN (LOBI PULMONIS)

RIND, ZIEGE, SCHAF:

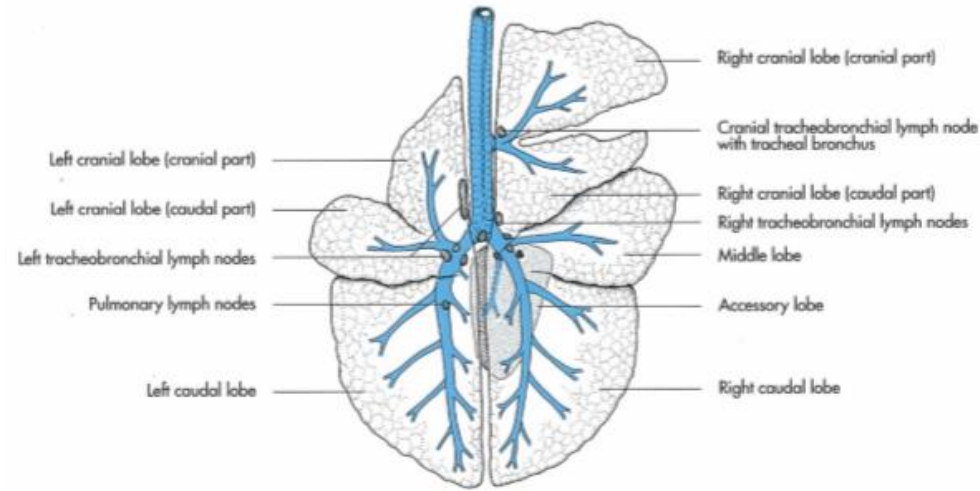
LINKE LUNGE:

1. Lobus cranialis sinister Pars cranialis
2. Lobus cranialis sinister Pars caudalis
3. Lobus caudalis sinister

RECHTE LUNGE:

1. Lobus cranialis dexter Pars cranialis
2. Lobus cranialis dexter Pars caudalis
3. Lobus medius
4. Lobus caudalis dexter

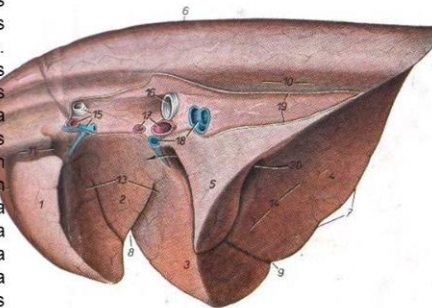
5. Lobus accessorius



<https://www.youtube.com/watch?v=dxlHH7aYzV8>

PULMO DEXTRA CATTLE

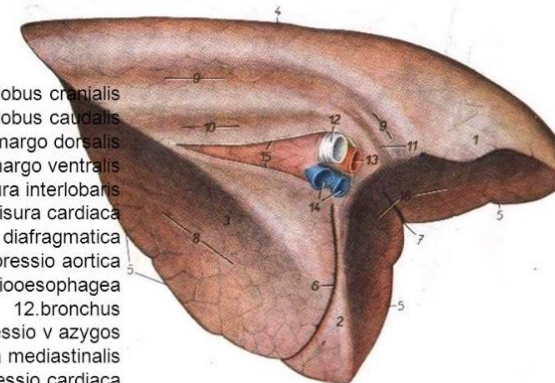
- 1,2 lobus cranialis
- 3 lobus medius
- 4 lobus caudalis
- 5 lobus accessorius
- 6 margo dorsalis
- 7 margo ventralis
- 8 incisura cardiaca
- 9 fissura interlobaris
- 10 impressio oesoph
- 11 impressio v.c.cran
- 12 impressio a,v thoracica interna
- 13 impressio cardiaca
- 14 facies diafragmatica
- 20 sulcus vena cava caudalis



<https://slideplayer.com/slide/6954748/>

PULMO SINISTRA CATTLE

- 1,2 lobus cranialis
3. lobus caudalis
4. margo dorsalis
5. margo ventralis
6. fissura interlobaris
7. Incisura cardiaca
8. facies diafragmatica
9. impressio aortica
- 10 impressiooesophagea
- 12.bronchus
- 11.Impressio v azygos
- 15.Ins pleura mediastinalis
- 16.Impressio cardiaca



<https://www.meiwoscience.com/animal-plastinated-specimens/lung-of-sheep-plastinated-specimen.html>

LUNGENLAPPEN (LOBI PULMONIS)

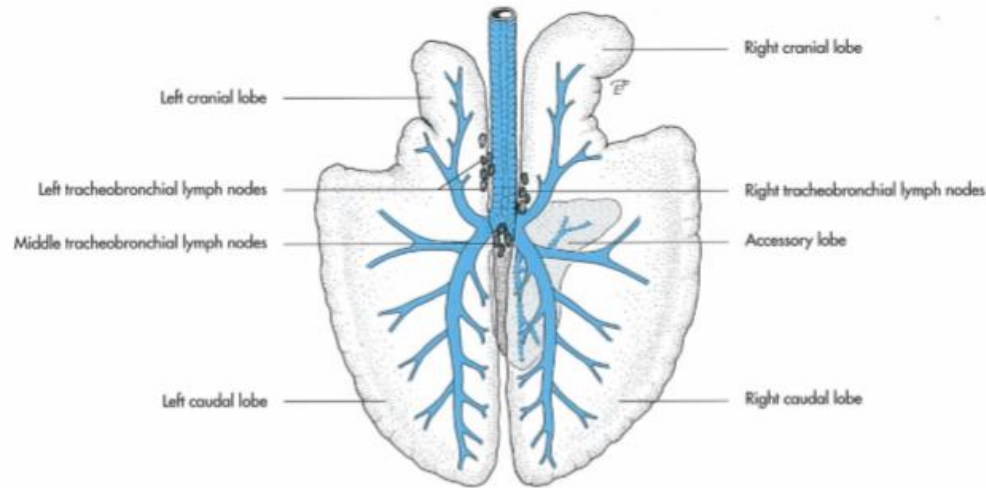
PFERD:

LINKE LUNGE:

1. Lobus cranialis sinister
2. Lobus caudalis sinister

RECHTE LUNGE:

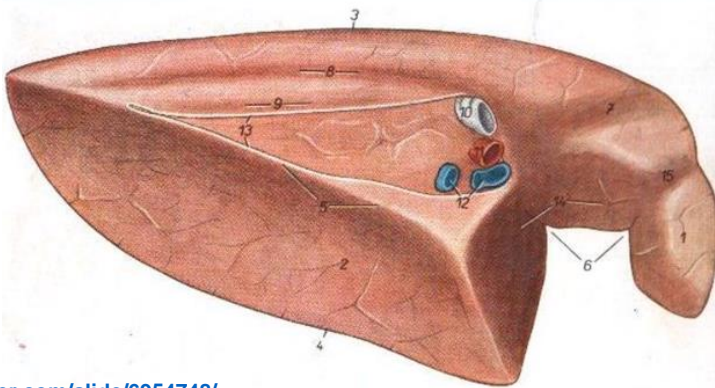
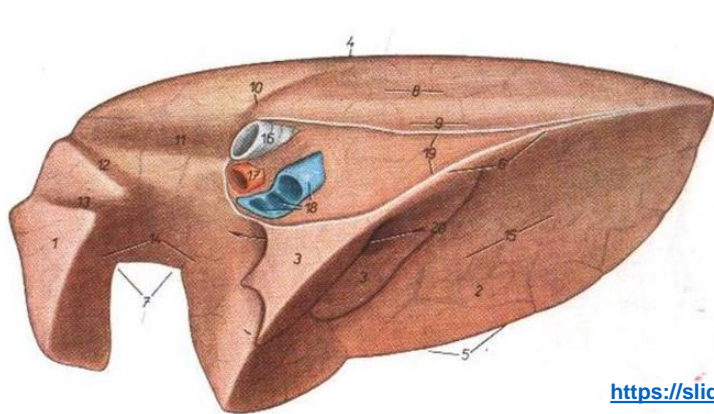
1. Lobus cranialis dexter
2. Lobus caudalis dexter
3. Lobus accessorius



https://www.alibaba.com/product-detail/Plastinated-Specimen-Animal-Horse-Lung_50031464596.html

Pulmo dextra HORSE

Pulmo sinistra HORSE



<https://slideplayer.com/slide/6954748/>

LUNGE (PULMO)

BRONCHUS TRACHEALIS:

- als Besonderheit für das **Schwein**, die **Wiederkäuern**
- rechtsseitig
- als selbständiger Lappenbronchus vor der Bifurcatio tracheae direkt aus der Trachea abzweigt

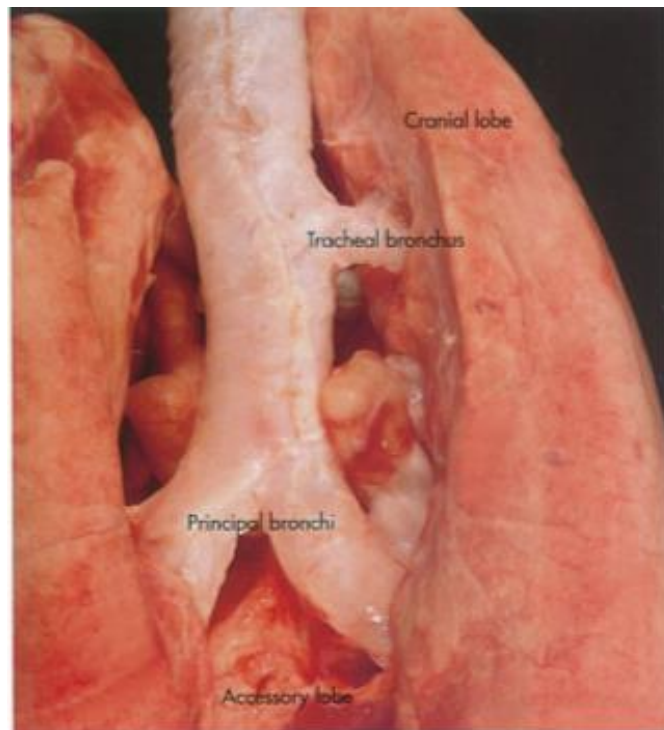


Fig. 8-32. Lungs of a pig, demonstrating the tracheal bronchus, dorsal aspect (courtesy of PD Dr. J. Maierl, Munich).

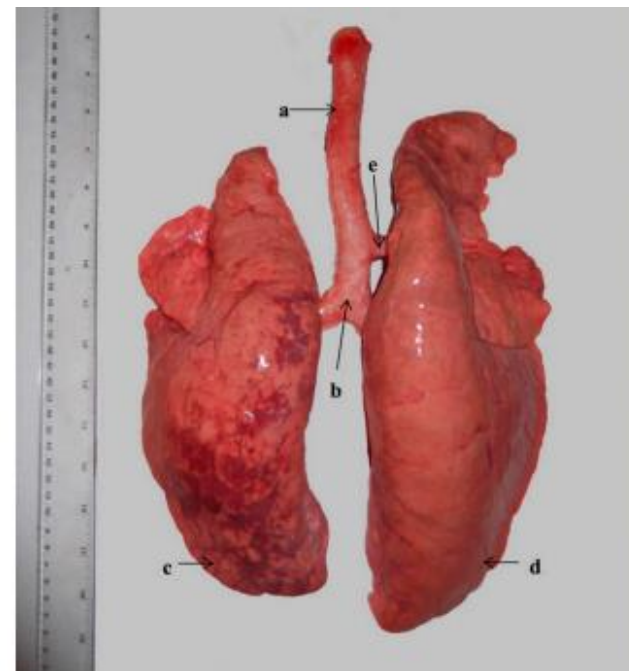
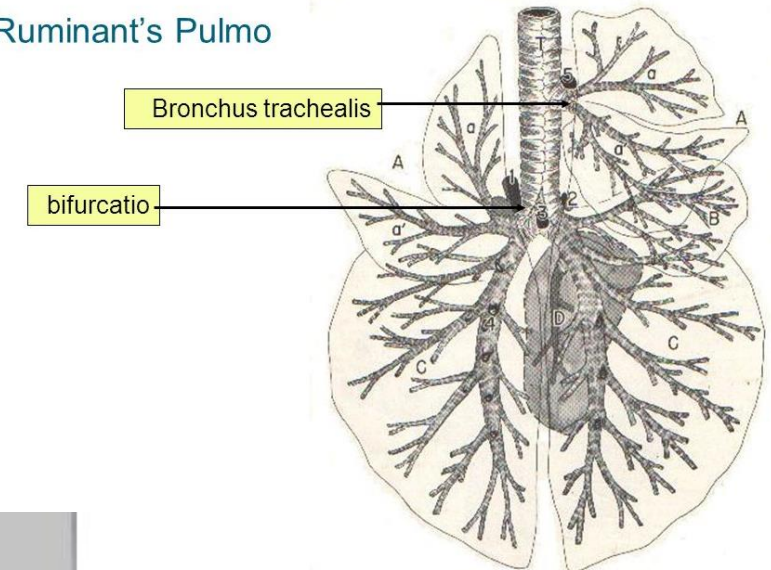


Figure 1. Porcine lung anatomy. Photograph (dorsal aspect) of lungs from a pig (age, ~ 22 wk; size, ~ 105 kg) showing trachea (a), carina (b), left lung (c), right lung (d), and cranial lobe bronchus (e). Standard 12-inch/30-cm ruler shown for scale.

<https://www.atsjournals.org/doi/pdf/10.1165/rcmb.2013-0453TR>

Ruminant's Pulmo



<https://slideplayer.com/slide/6954748/>

LUNGE (PULMO)

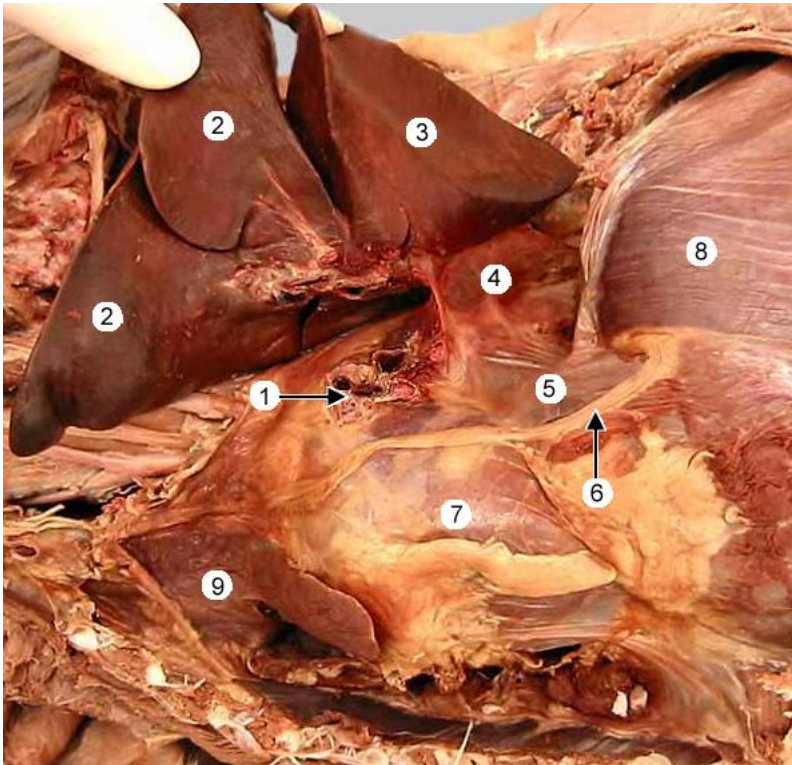
- LUNGENFELL:

1. Pleura pulmonalis bzw. Pleura visceralis

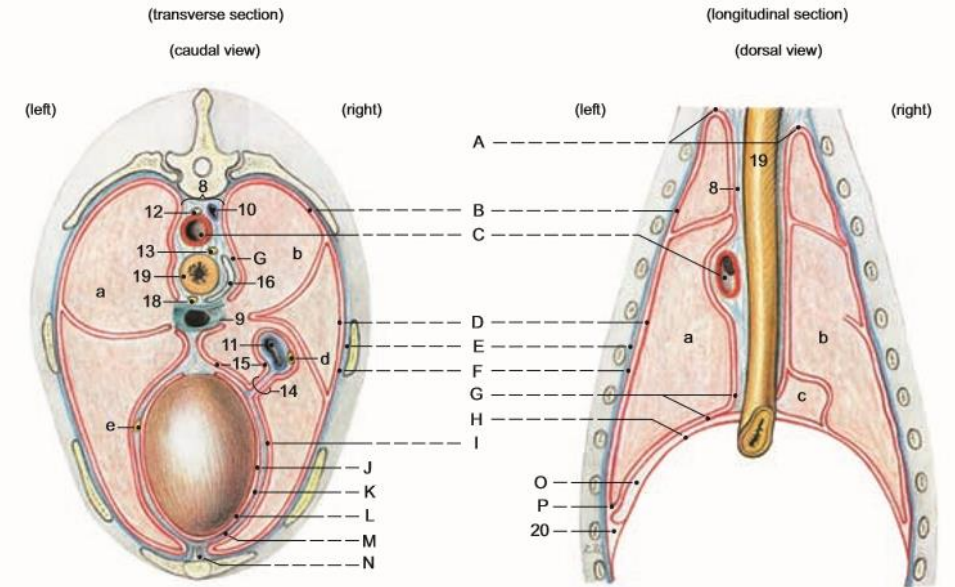
2. Pleura parietalis

- Cavum pleurae (Pleuraspalt)

- Liqour pleurae (seröse Pleuraflüssigkeit) – die Reibung während der Atmung herabsetzt



On the left side, the root of the lung (1) has been cut and the lung is reflected. The **left lung** is composed of a cranial lobe (2) with cranial and caudal parts and a caudal (3) lobe. The lung is covered by **visceral (pulmonary) pleura**. The **pulmonary ligament** (4), connects between visceral pleura and mediastinal parietal pleura (5). The **phrenic nerve** (6) crosses the surface of the heart (7) on its way to innervate the diaphragm (8). The thymus (9) is situated in the mediastinum cranial to the heart.



Legend :

A Pleural cupulae	F Costal pleura	Serous pericard	N Phrenicopericardiac lig.	a Left lung
B Pleural cavities	G Mediastinal pleura	K Parietal lamina	O Left mediastinodiaphragmatic recess	b Right lung
C Descending aorta	H Diaphragmatic pleura	L Visceral lamina	P Costomediastinal recess	c Acc. lobe
D Pulmonary pleura	I Pericardiac pleura	M Fibrous pericardium		d Right phrenic n.
E Endothoracic fascia	J Pericardial cavity			e Left phrenic n.

VERSORGUNG DER LUNGE

VASA PUBLICA:

- funktionelle Gefäßsystem des kleinen Lungenkreislaufs
- über den Truncus pulmonalis
- Aa. pulmonales – Äste des Truncus pulmonalis, führen venöses Blut
- Vv. pulmonales – führen arterielles Blut in die linke Vorkammer des Herzens

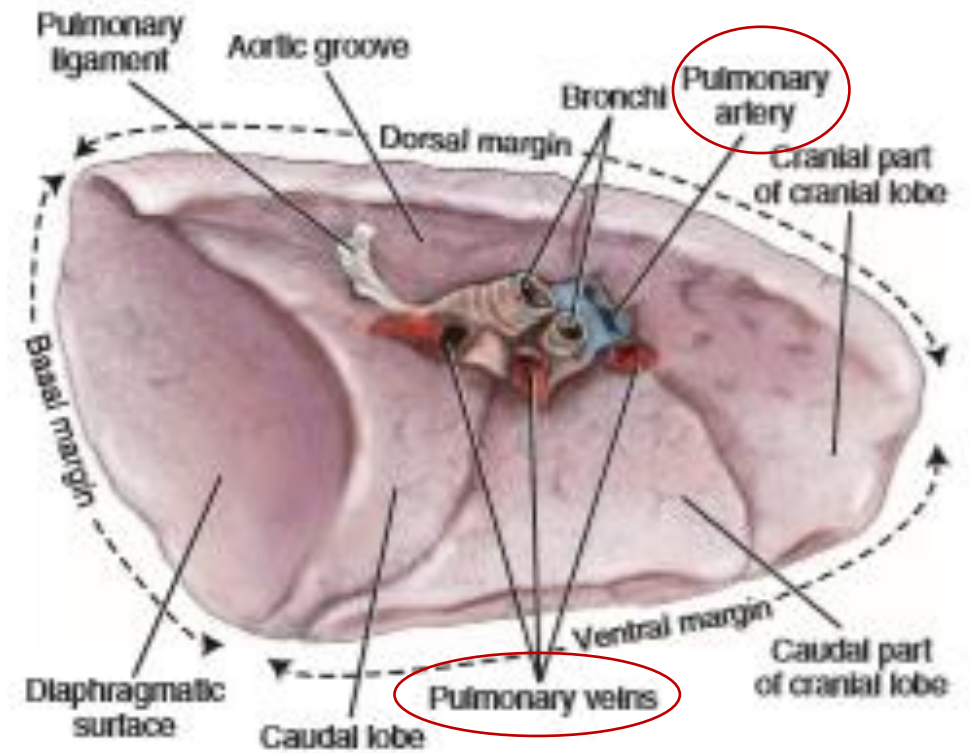
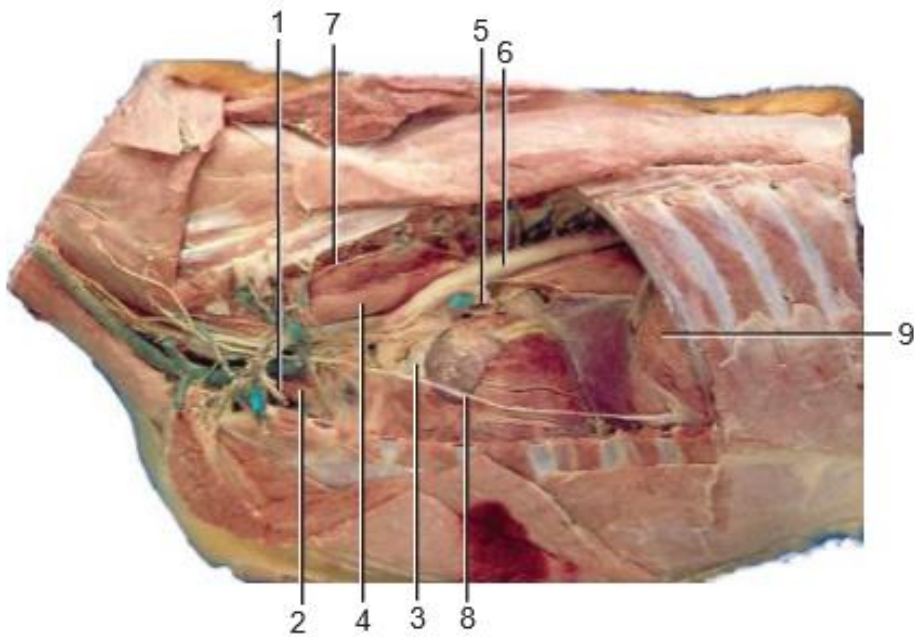


FIGURE 8-35 Margins and surfaces of the left lung, medial view.

VERSORGUNG DER LUNGE

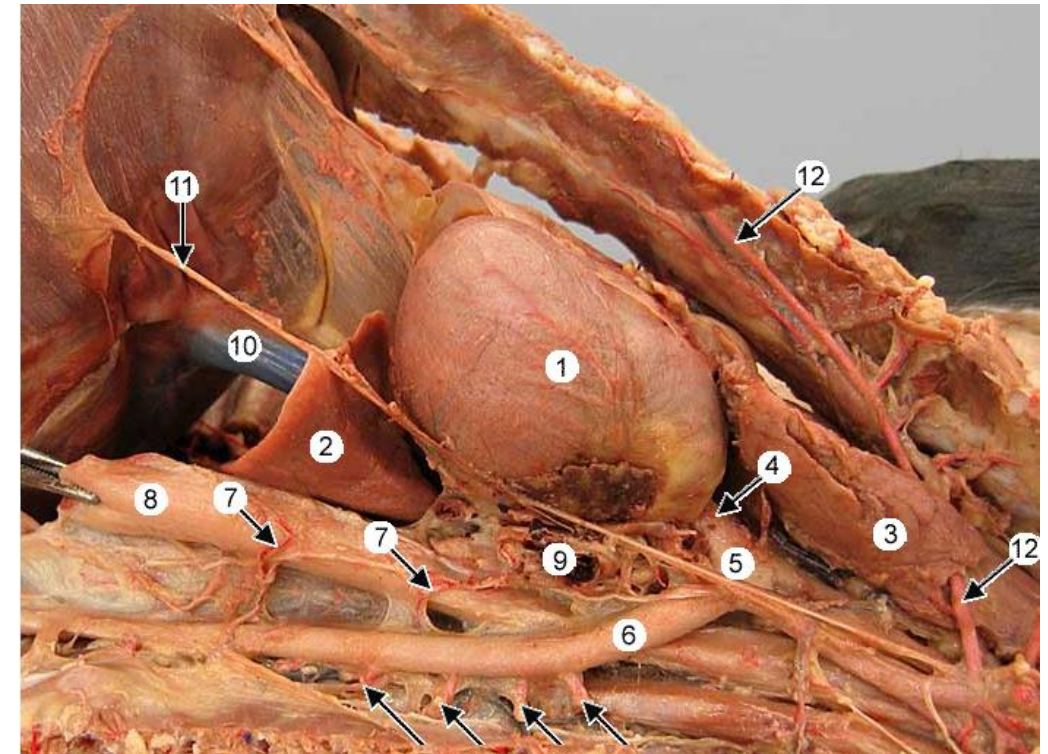
VASA PRIVATA:

- nutritive Versorgung
- erfolgt über das Gefäßsystem der A. et V. broncho – oesophagea - Rr. bronchiales



1. Internal thoracic vessels
2. Thymus
3. Pulmonary trunk
4. Esophagus
5. Pulmonary veins entering left atrium
6. Aorta
7. Sympathetic trunk
8. Phrenic nerve
9. Diaphragm

Note: The lung and most of the pericardium have been removed.



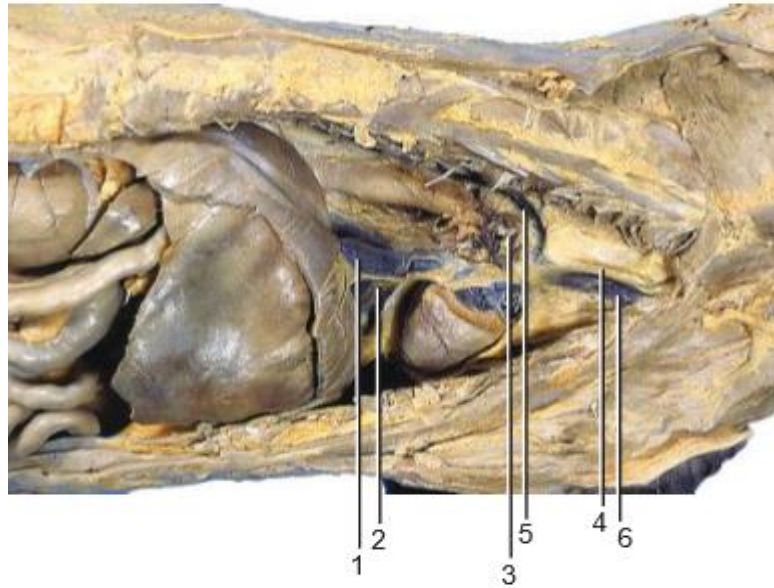
Cat dissection, left dorsolateral view of the thorax. The heart (1), accessory lobe of the right lung (2), and the thymus (3) are evident, as are the **ascending aorta** (4), the **aortic arch** (5) and the **descending aorta** (6). The latter gives rise to dorsal **intercostal arteries** (arrows). In this specimen, two **bronchoesophageal arteries** (7) can be seen supplying the esophagus (8) and the root of the left lung (9).

Also notice the caudal vena cava (10), the **phrenic n.** (11) innervating the diaphragm, and the **internal thoracic a.** (12).

<http://vanat.cvm.umn.edu/carnLabs/Lab11/lmg11-11.html>

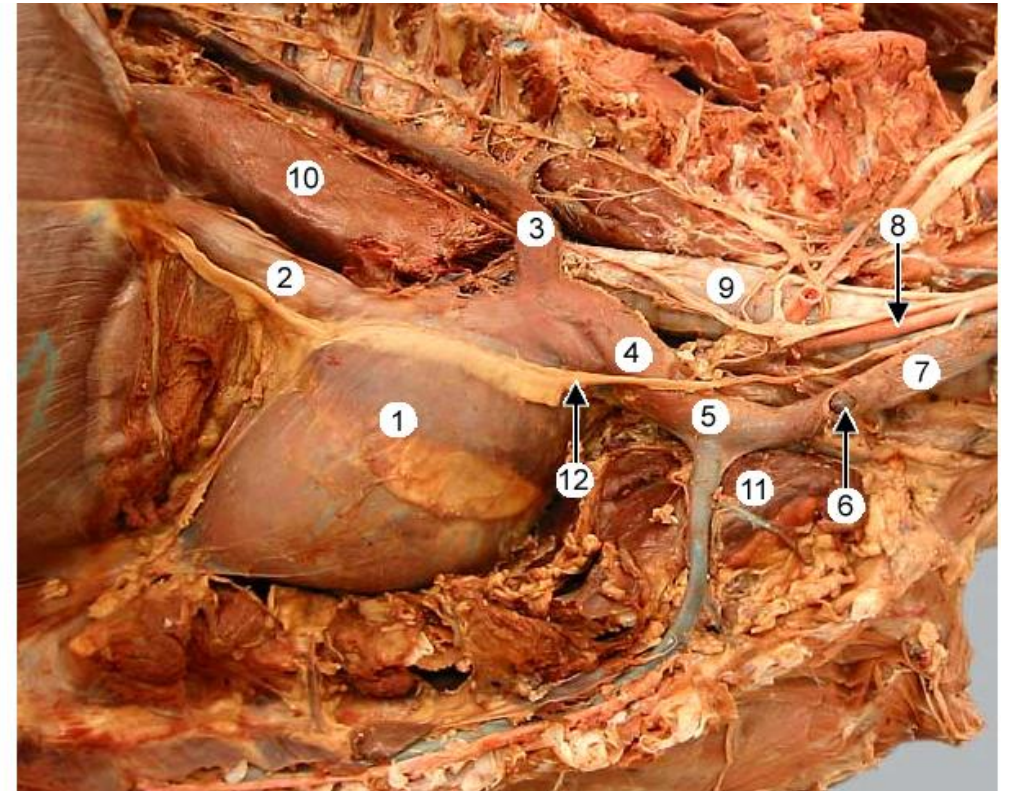
VERSORGUNG DER LUNGE

- VASA PRIVATA:
- Vv. bronchiales – in die V. azygos



1. Caudal vena cava
2. Plica venae cavae
3. Root of lung and phrenic nerve
4. Right vagus
5. Right azygos vein
6. Cranial vena cava

Note: The right lung and most of the pericardium have been removed.



Mediastinum, right side: The right lung and mediastinal pleura have been removed to expose vessels and nerves. The **heart** (1) receives blood from the **caudal vena cava** (2), the **azygos vein** (3), and the **cranial vena cava** (4). The latter receives blood from bilateral **brachiocephalic veins** (5), each formed by the union of a subclavian vein (6) (cut away) and an external jugular vein (7).

DANKE FÜR
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AUFMERKSAMKEIT!



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