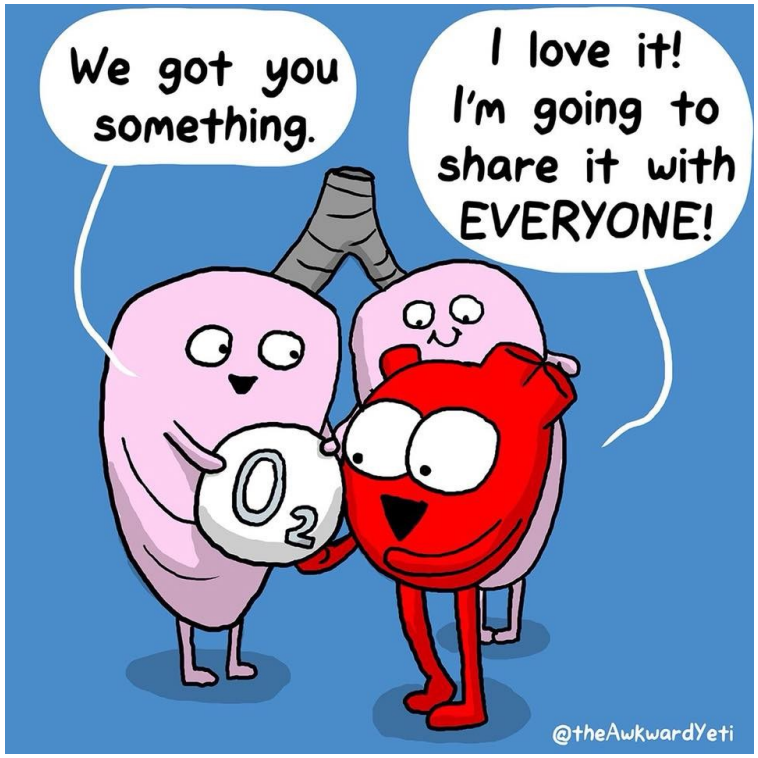
Atmungssystem, Stimmbildung, Brustwand, Anatomie und Mechanik der Atembewegungen

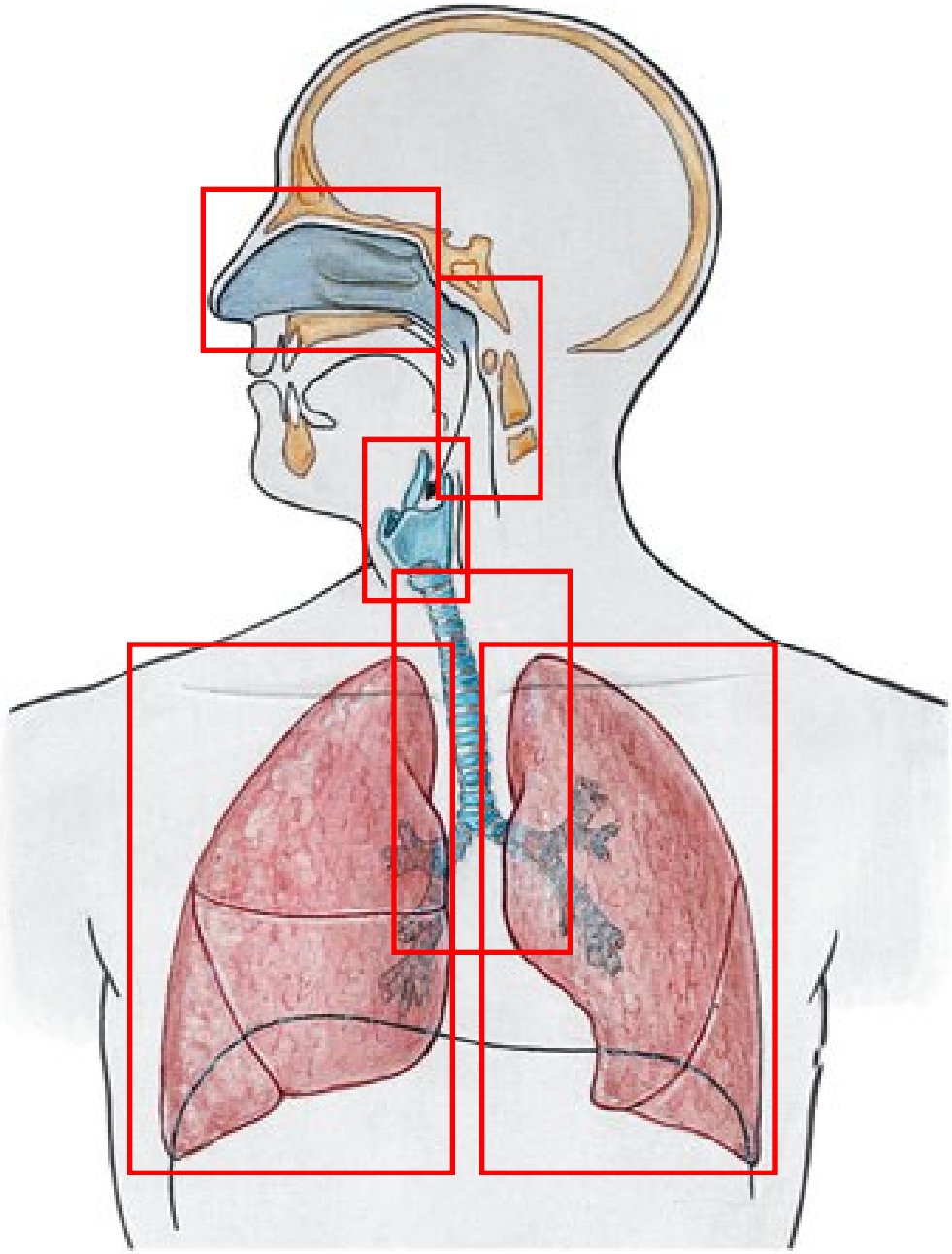


Dr. Emese Pálfi
Semmelweis Universität
Anatomisches, Histologisches und Embryologisches Institut

Atmungssystem (*Apparatus respiratorius*)

Gastransport zu und von der Zellen.

Jede Teilen funktionieren als Atemwege (zB.: Luftröhre, Bronchusbaum), nehmen teil in Reinigung (zB.: Nasenhöhle), oder können Luftvibration verursachen (Kehlkopf).



Atemwege:

-obere:

Nasenhöhle (*Cavum nasi*)

Nasennebenhöhle (*Sinus paranasalis*)

Rachen (*Naso-, oro-, laryngopharynx*)

-untere:

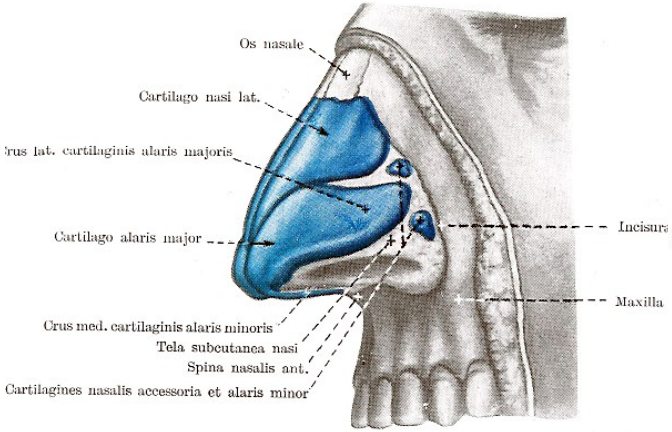
Kehlkopf (*Larynx*)

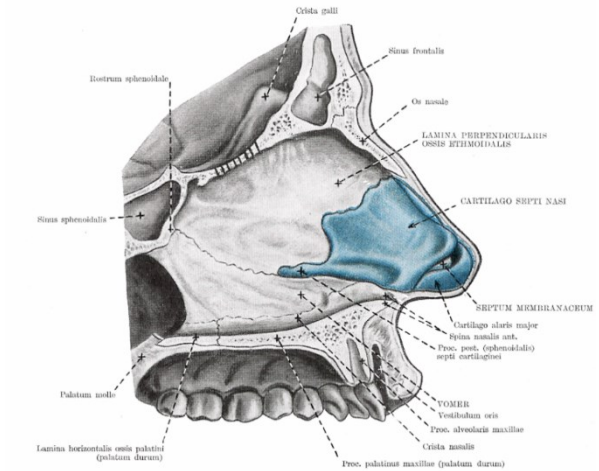
Luftröhre (*Trachea*)

Hauptbronchus (*Bronchus principalis dexter et sinister*)

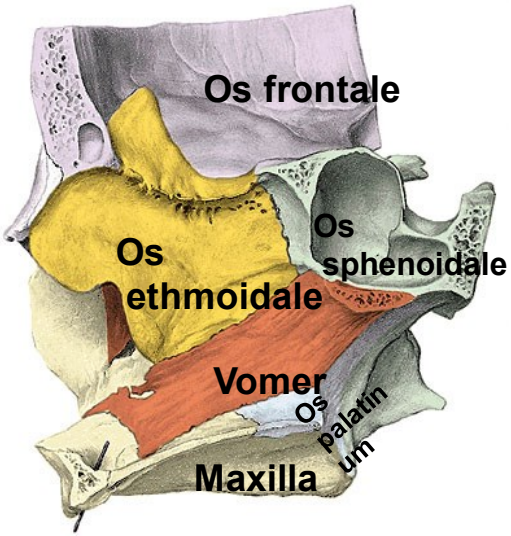
Bronchusbaum (*Bronchi lobares, Bronchi segmentales, Bronchchen, Bronchiolen*)

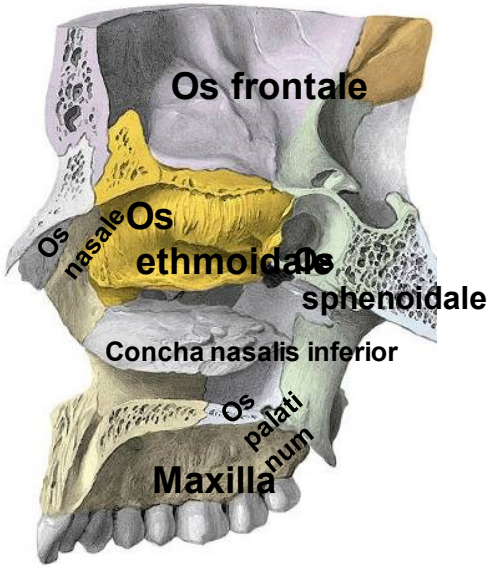
Äußere Nase *(Nasus externus)*





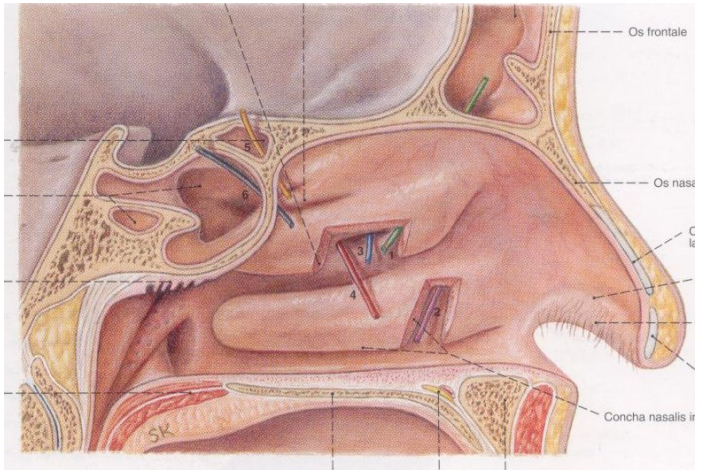
Nasenhöhle *(Cavum nasi)*

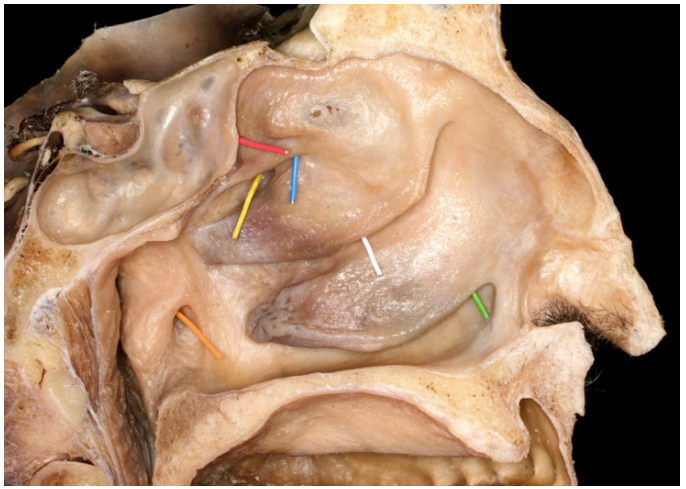




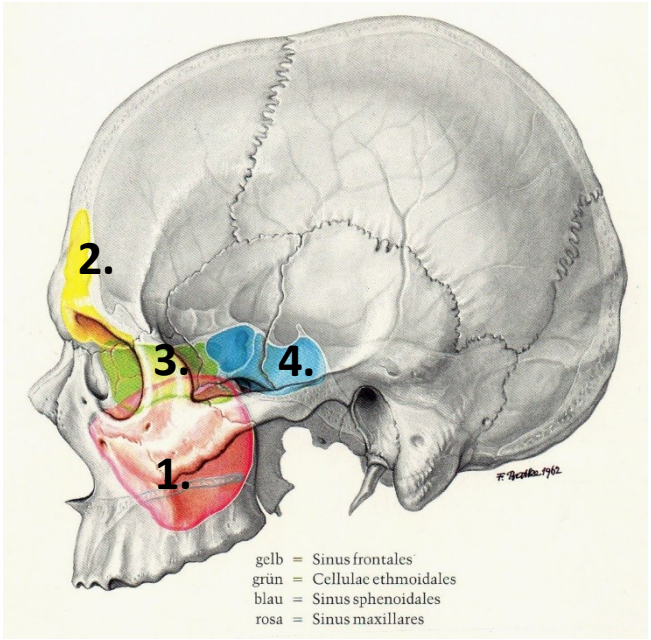
Nasengänge *(Meati nasales)*

Meatus nasi superior
Meatus nasi medius
Meatus nasi inferior
Meatus nasi communis

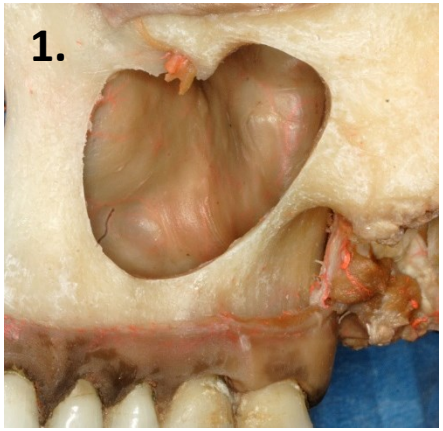


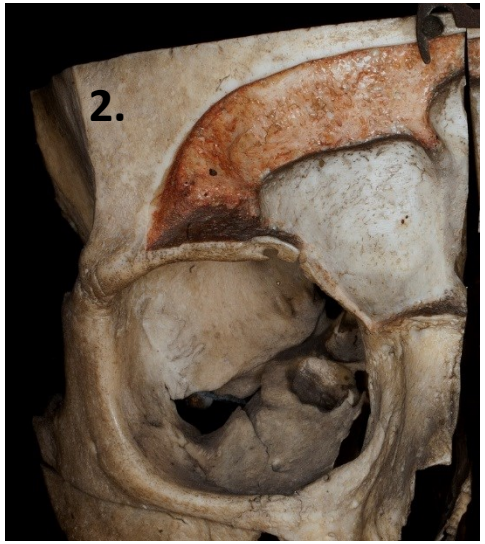


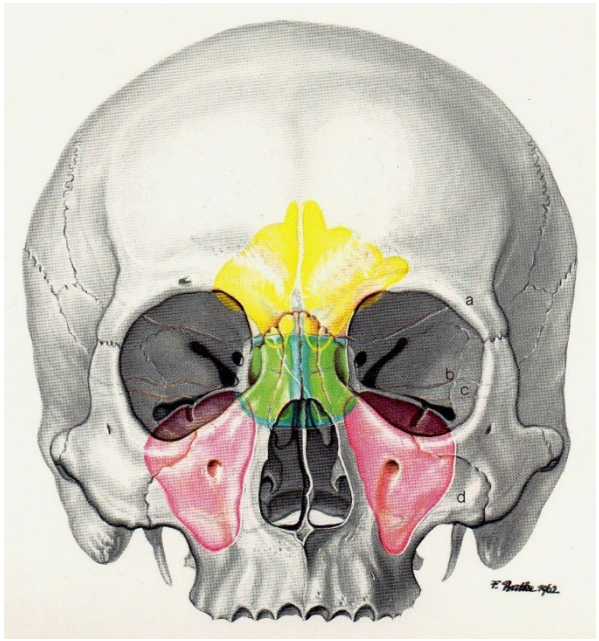
Nasennebenhöhlen *(Sinus paranasales)*

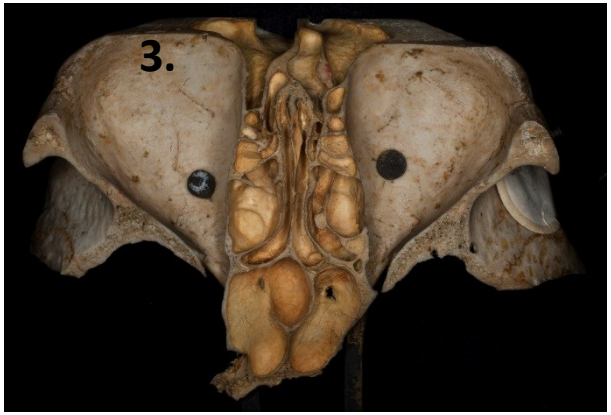


1. Kieferhöhle *(Sinus maxillaris)*
2. Stirnhöhle *(Sinus frontalis)*
3. Siebbeinhöhle *(Sinus+Cellulae ethmoidales)*
4. Keilbeinhöhle *(Sinus sphenoidalis)*

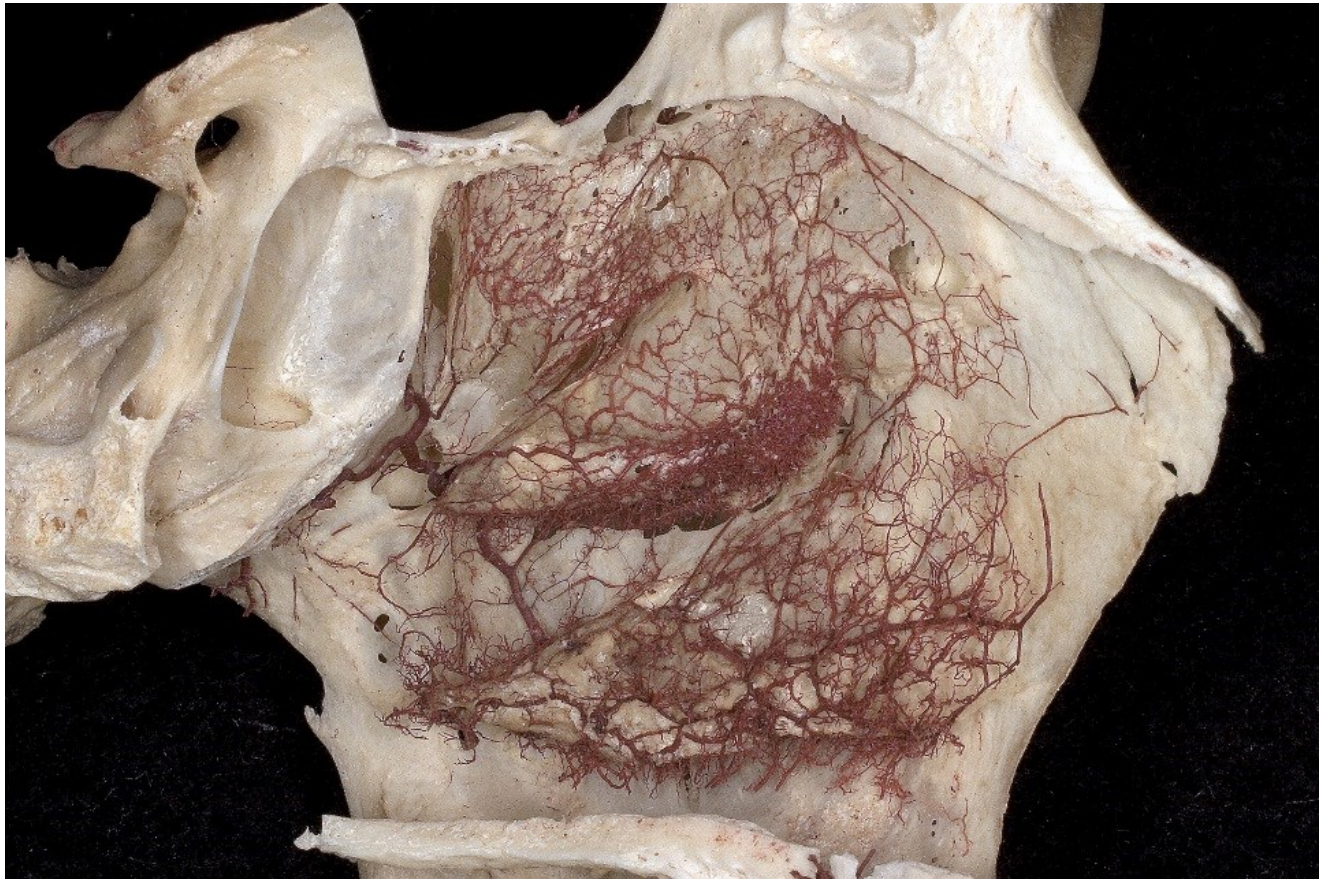








Blutversorgung und Innervation der Nasenhöhle



Äste von A. carotis externa

Tiefe Venen des Gesichts

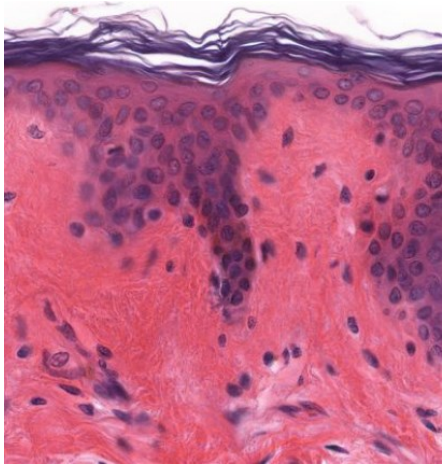
N. Trigeminus (sensorisch)
N. Facialis (sekretomotorisch)

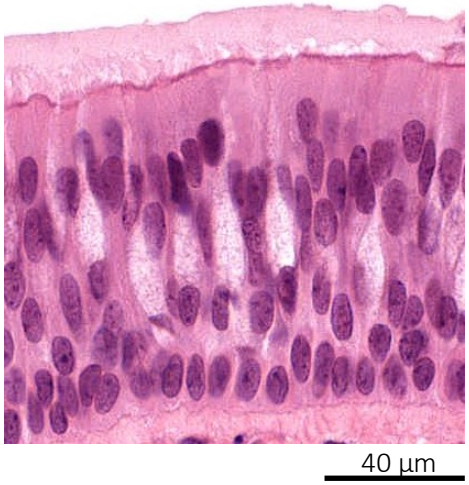
Schleimhaut der Nasenhöhle

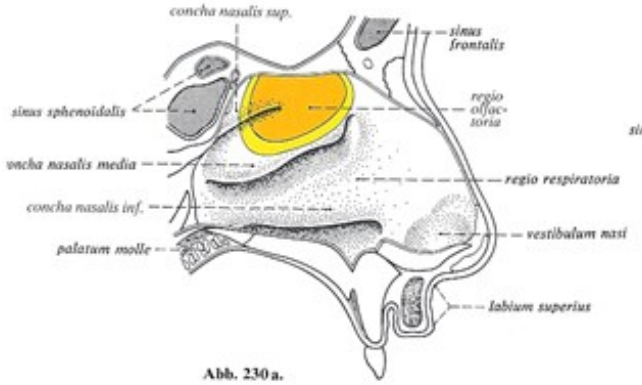
Nasenvorhof (*Vestibulum*): mehrsichtiges unvernhortes Plattenepithel

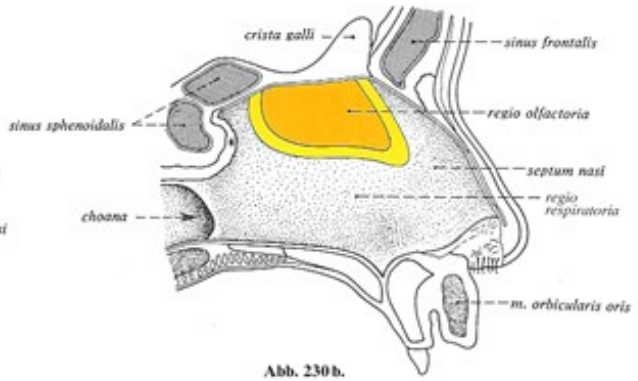
Atmungsbereich *(Regio respiratoria)*: mehrreihiges hochprismatisches Flimmerepithel

Riechbereich *(Regio olfactoria)*: Sinnesepithel

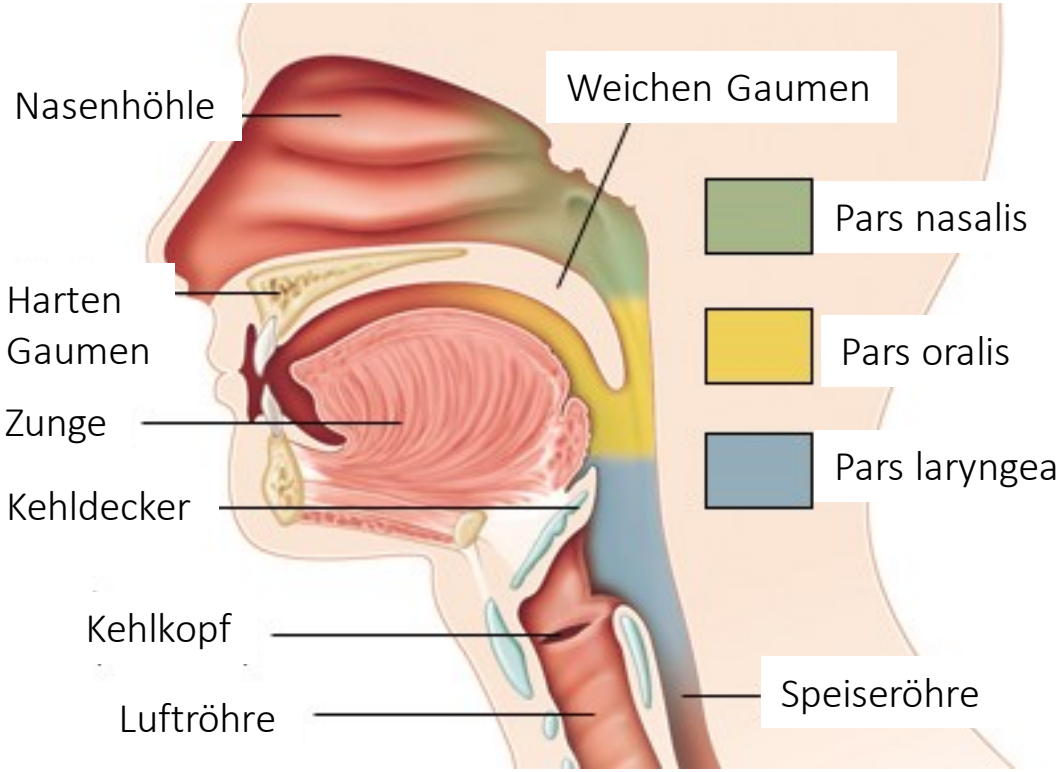


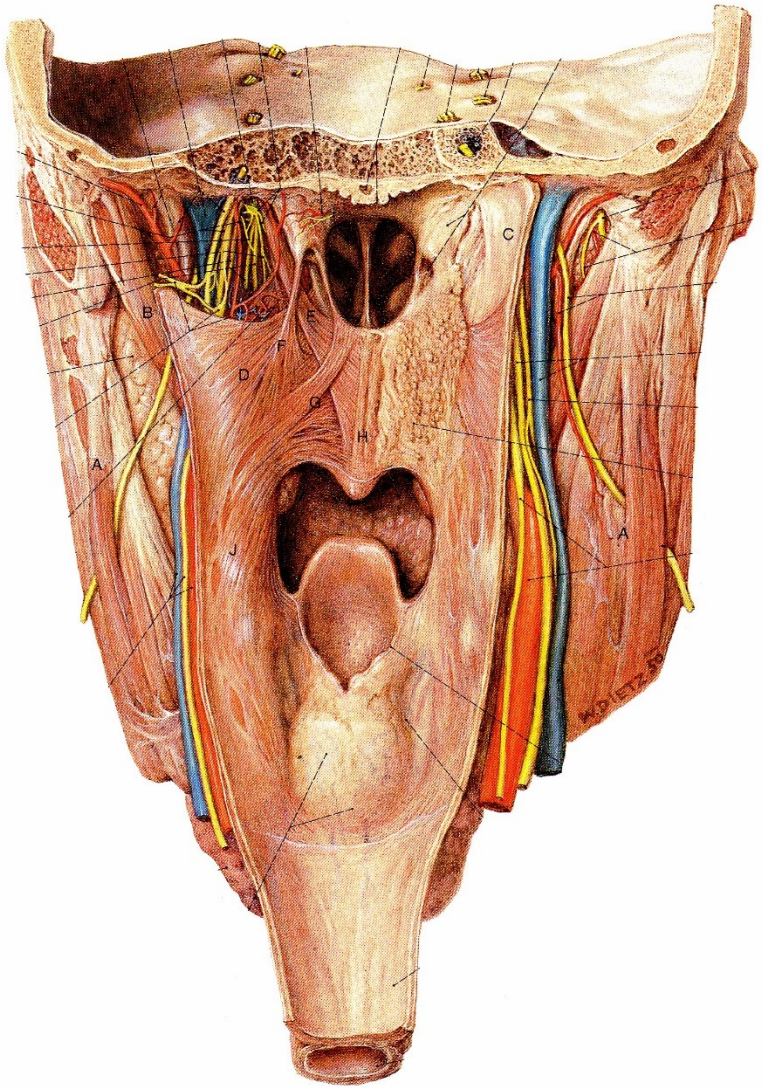




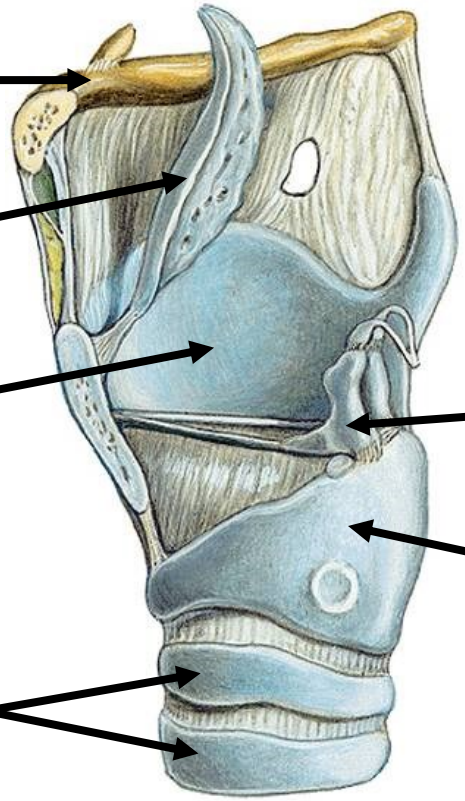


Rachen *(Pharynx)*





Kehlkopf *(Larynx)*



Zungenbein
(*Os hyoideum*)

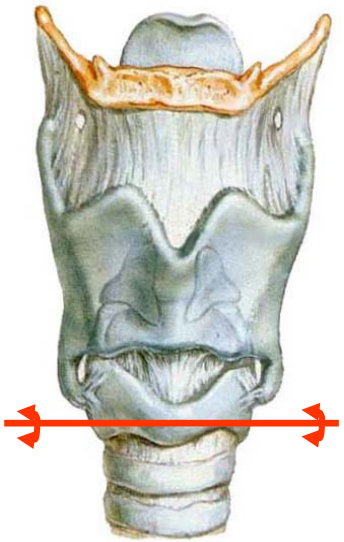
Kehldeck
(*Epiglottis*)

Schildknorpel
(*Cart. thyroidea*)

Stellknorpel
(*Cart. arytenoidea*)

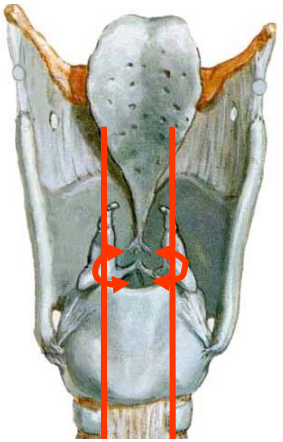
Ringknorpel
(*Cart. cricoidea*)

Knorpeln von
Trachea



Articulatio cricothyroidea

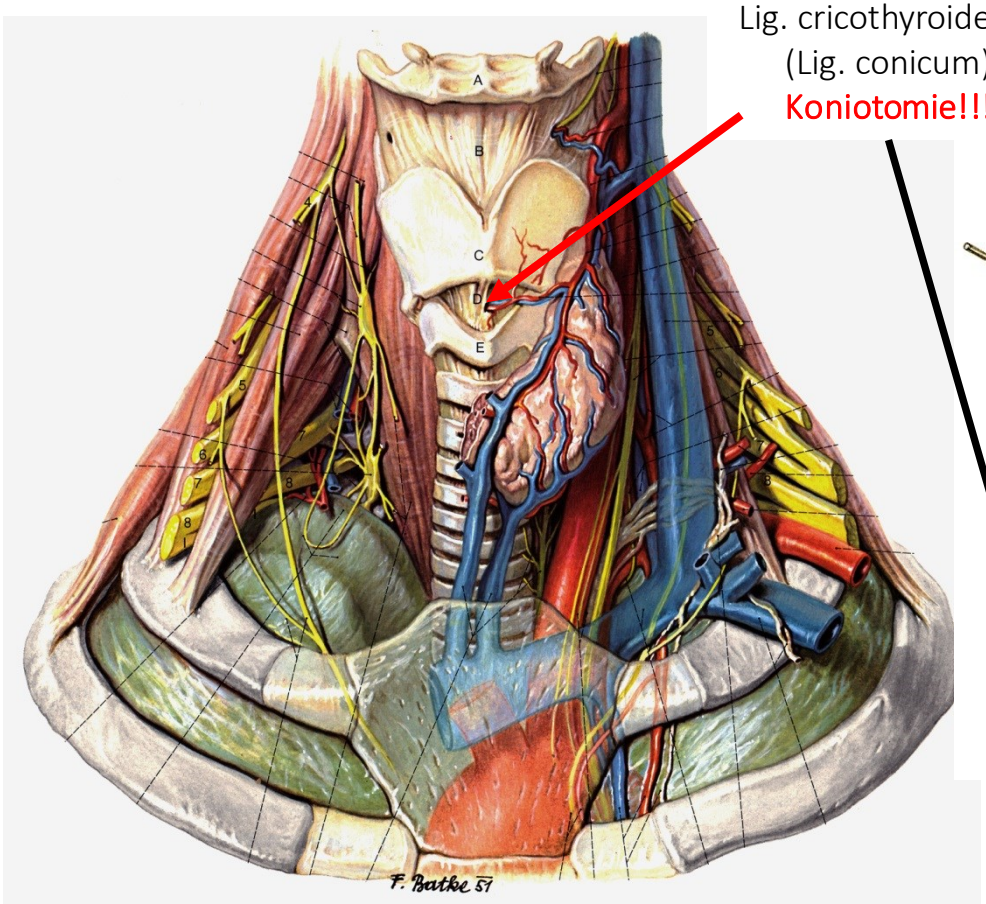
Scharniergelenk



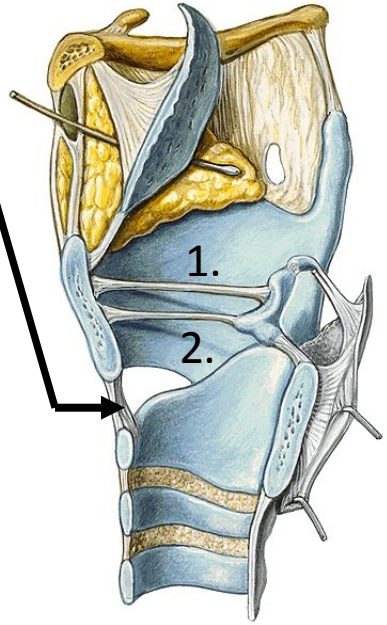
Articulatio cricoarytenoidea

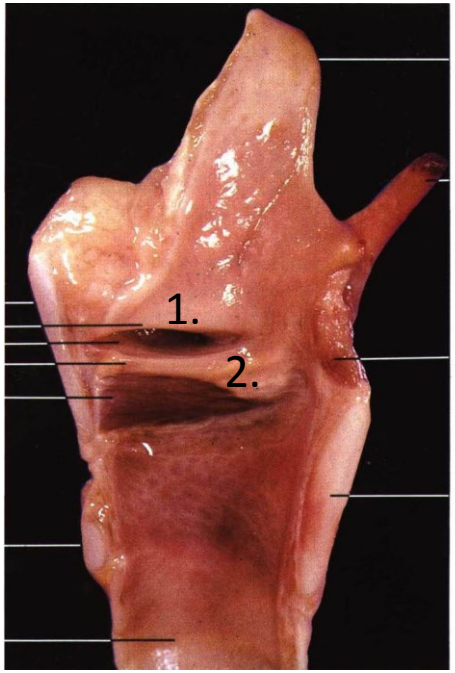
Radgelenk

Kehlkopfbänder



Lig. cricothyroideum
(Lig. conicum)
Koniotomie!!!

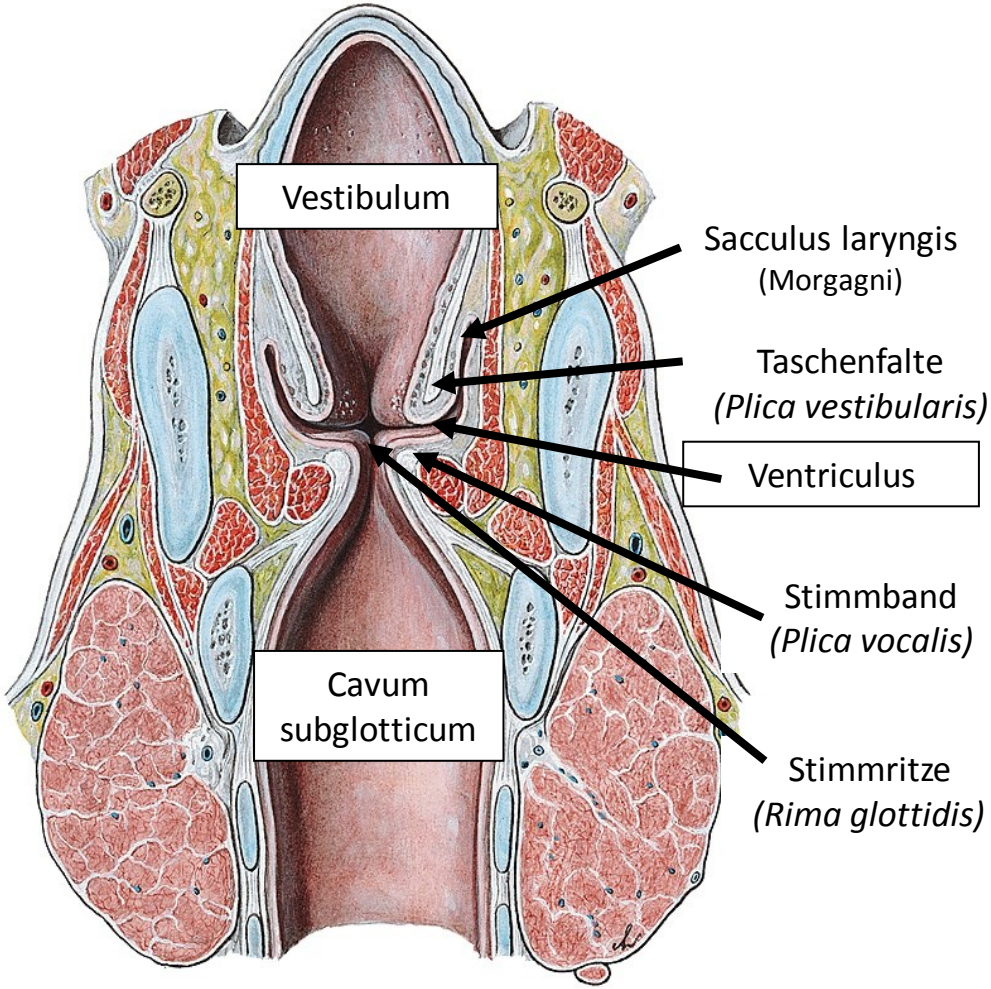


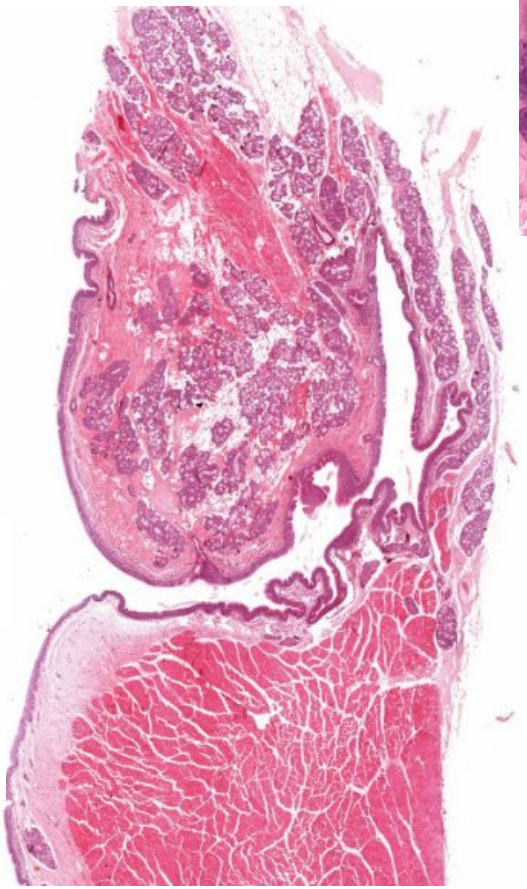


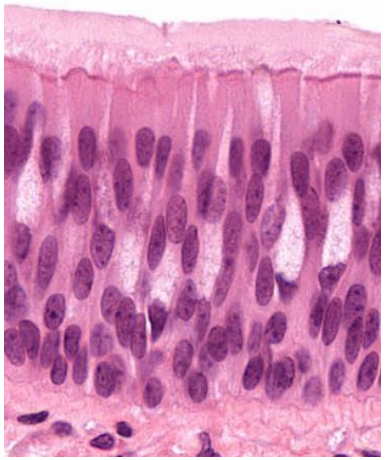
1. Taschenfalte (Lig. vestibulare)

2. Stimmfalte (Lig. vocale)

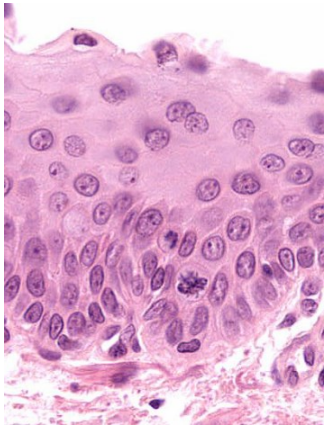
Kehlkopfschleimhaut





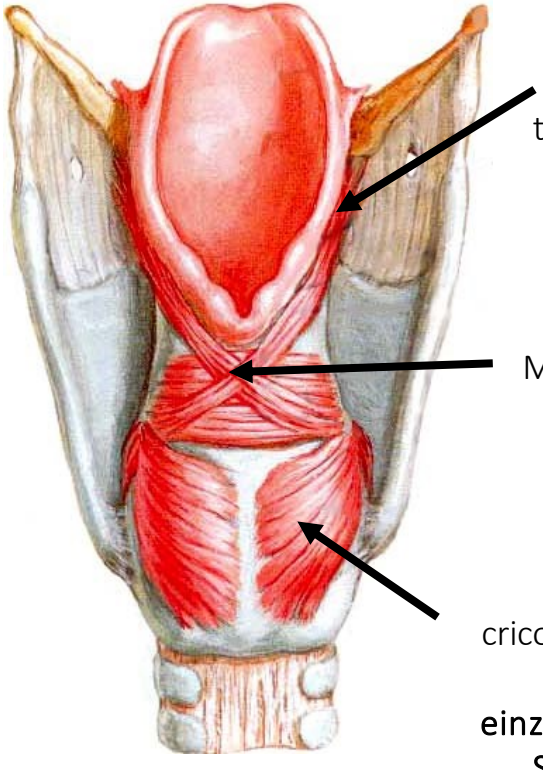


Mehrreihiges
hochprismatisches
Flimmerepithel



Plica vocalis
mehrsichtiges
unvernhorntes
Plattenepithel

Kehlkopfmuskeln und Stimmbildung

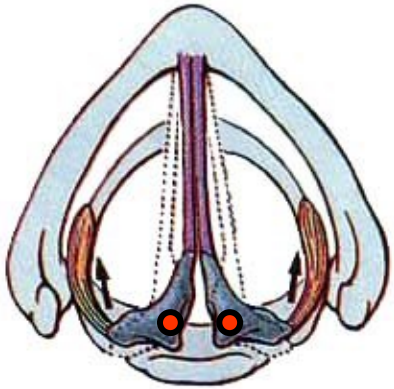


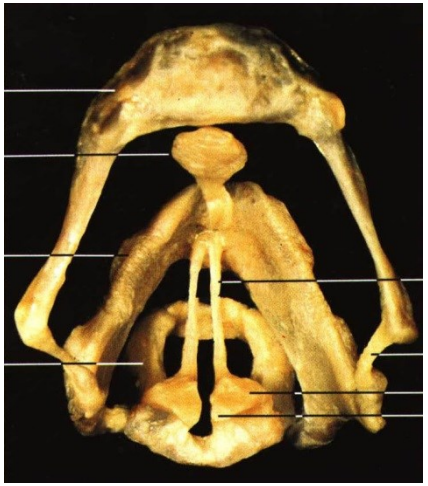
Musc. thyroarytenoideus vernegt den Kehlkopfeingang

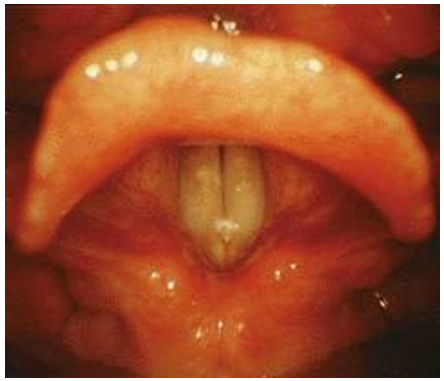
Musc. arytenoideus schließt die Stimmritze

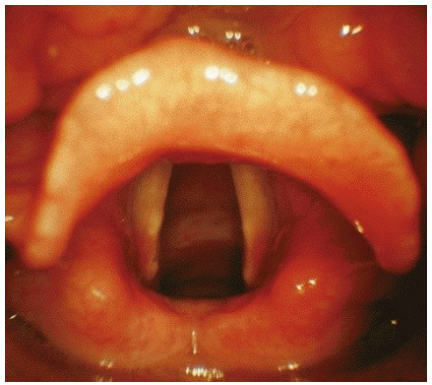
Musc. cricoarytenoideus post.
einzige Öffner der Stimmritze
Lehmung - Luftnot

Stimmritze *(Rima glottidis)*







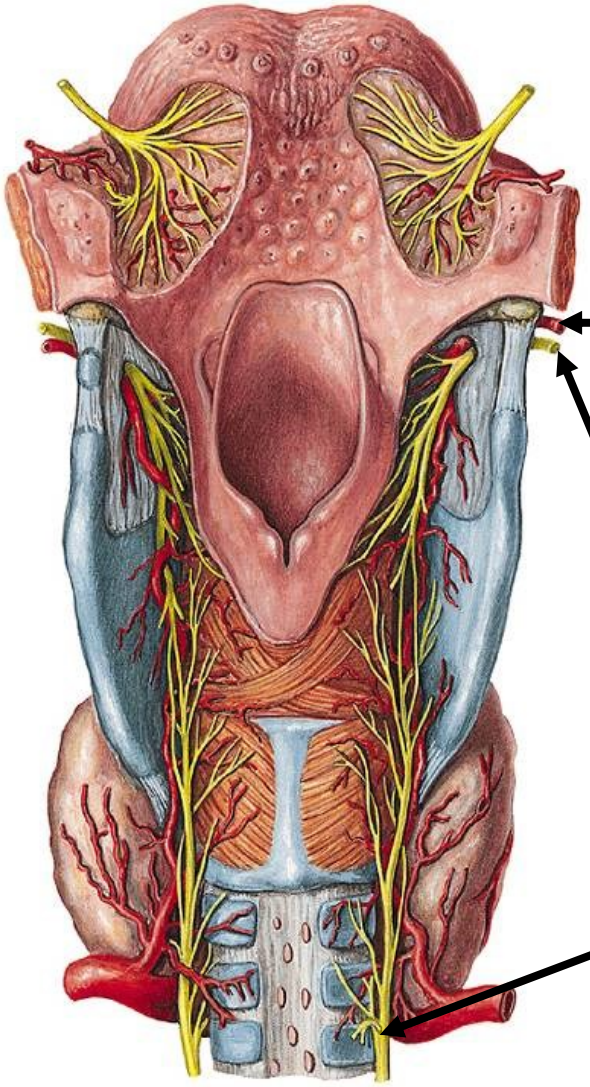


Musc. cricothyreoideus – spannt das Stimmband

Musc. cricoarytenoideus lat. – schließt die Stimmritze

Musc. vocalis – spannt das Stimmband

Blutversorgung und Innervierung des Kehlkopfs



A. laryngea sup. (a. thyroidea sup.)

A. laryngea inf. (a. thyroidea inf.)

V. laryngea sup.

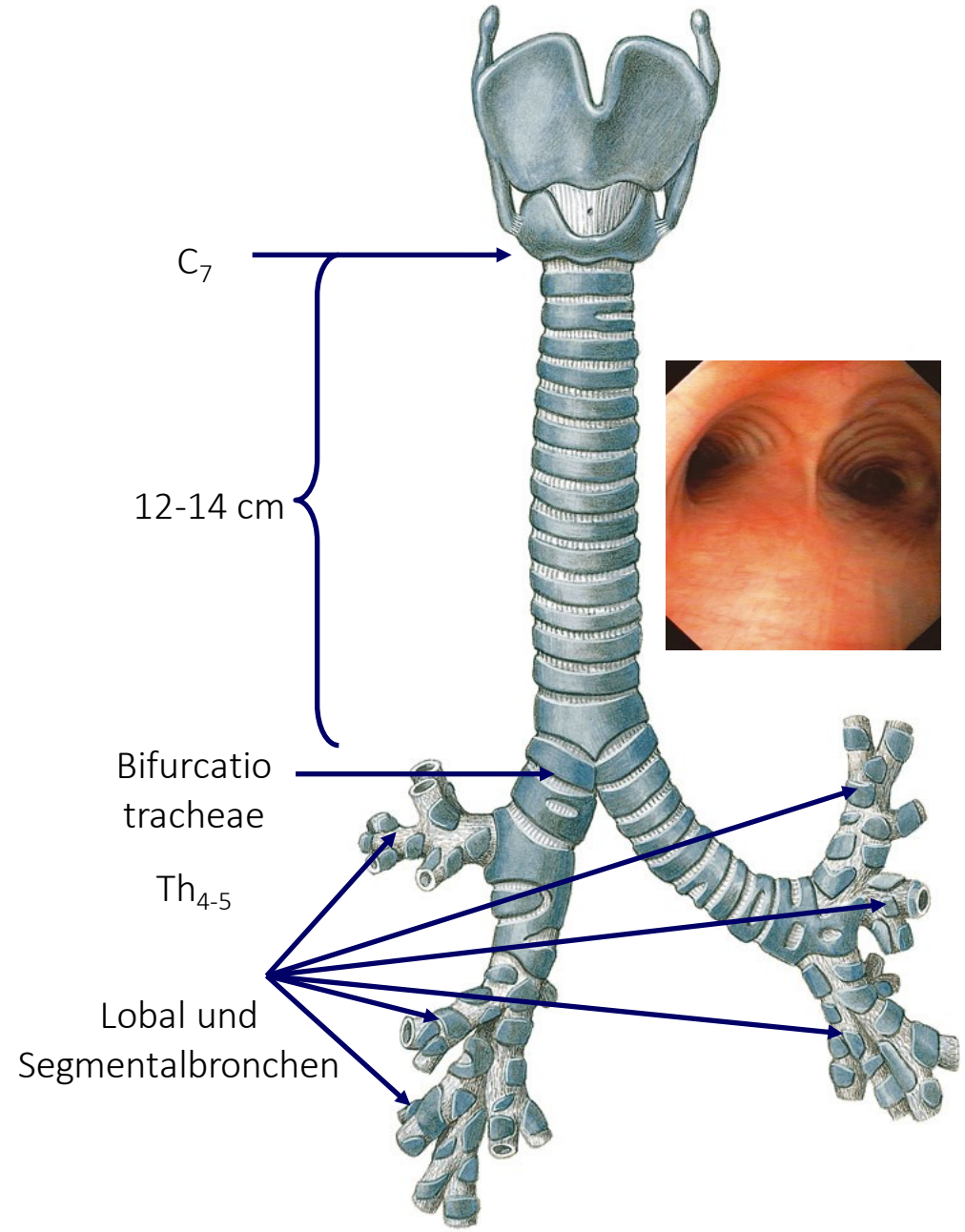
V. laryngea inf.

N. laryngeus sup.

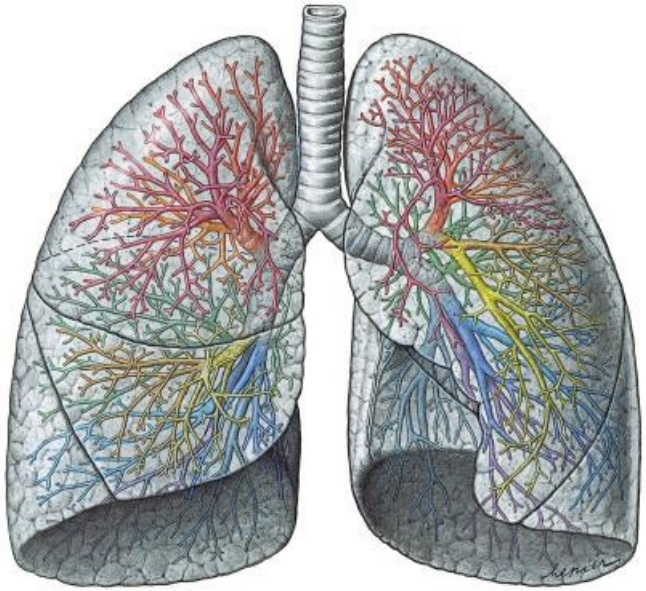
N. laryngeus inf. (N. laryngeus recurrens)

Vegetative Innervierung: N. vagus, Tr. sympathicus

Luftröhre *(Trachea)* und Bronchialbaum *(Arbor bronchialis)*

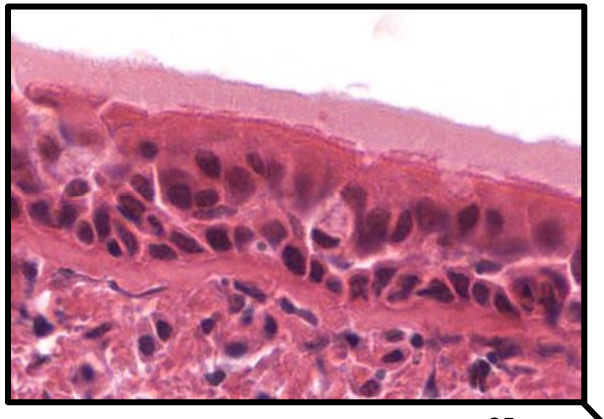


dichotomische Verzweigungen

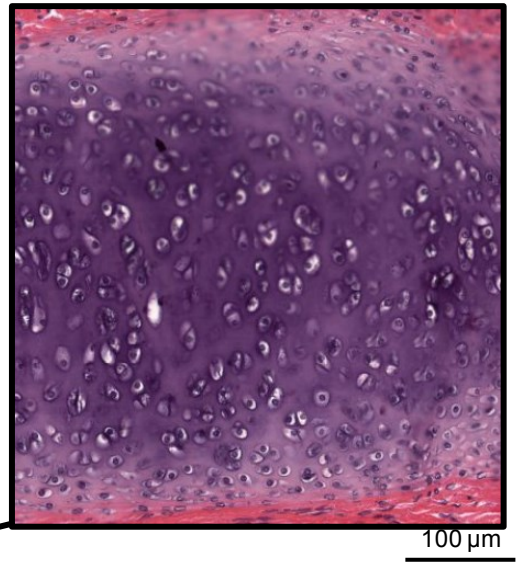


Trachea → Bronchus pricipalis → Bronchus lobaris → Bronchus segmentalis

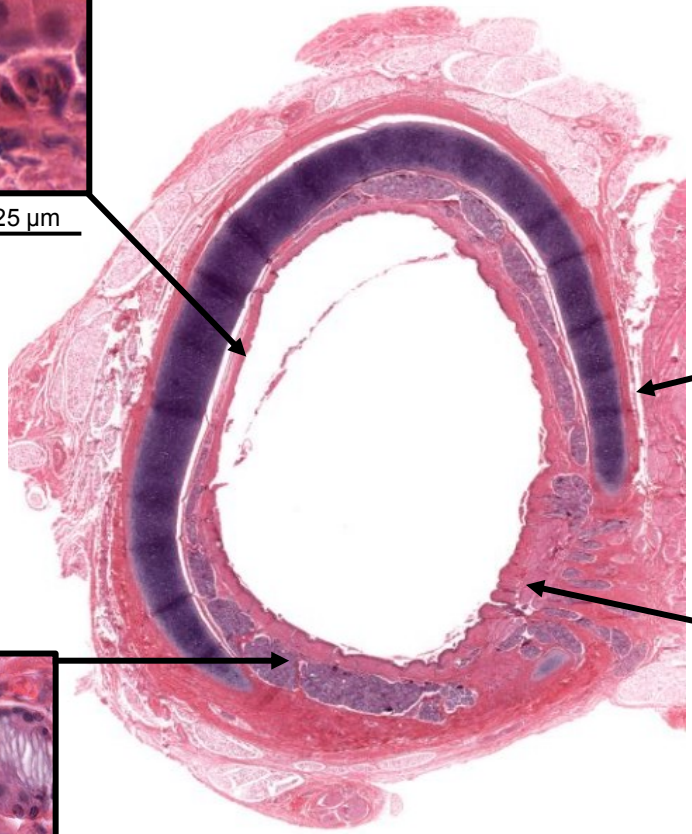
Histologie der Luftröhre



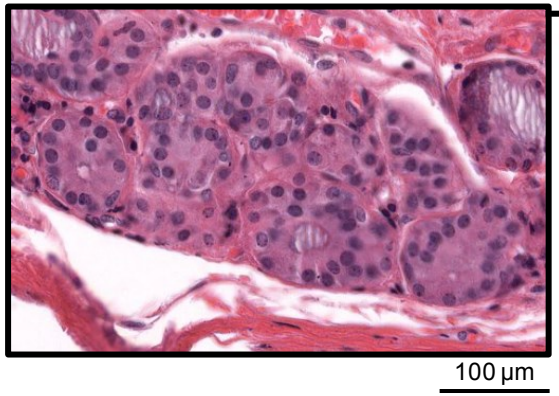
mehrreihiges
hochprismatisches
Flimmerepithel



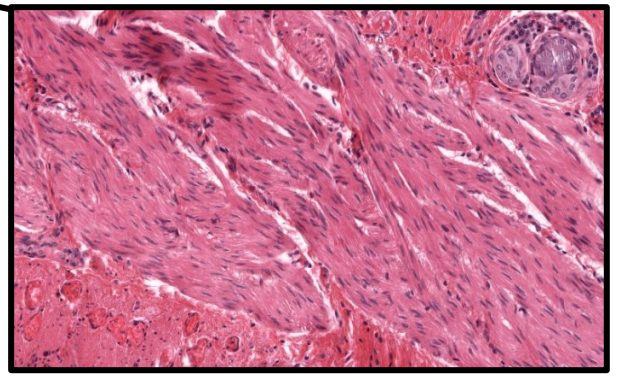
hyaliner Knorpel
C-förmig



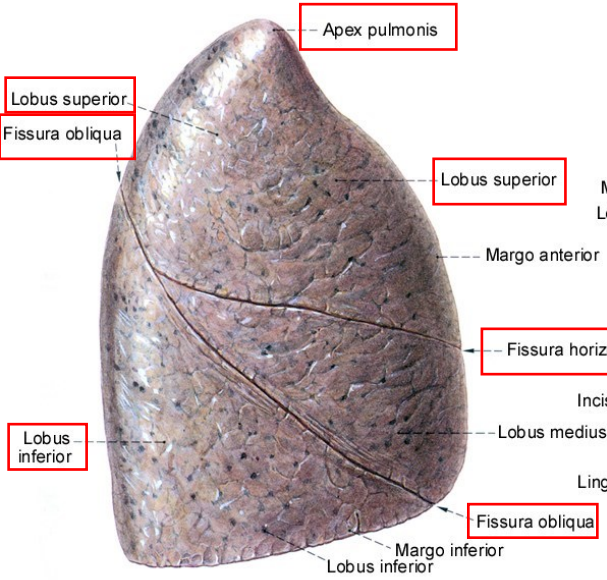
muköse Drüsen

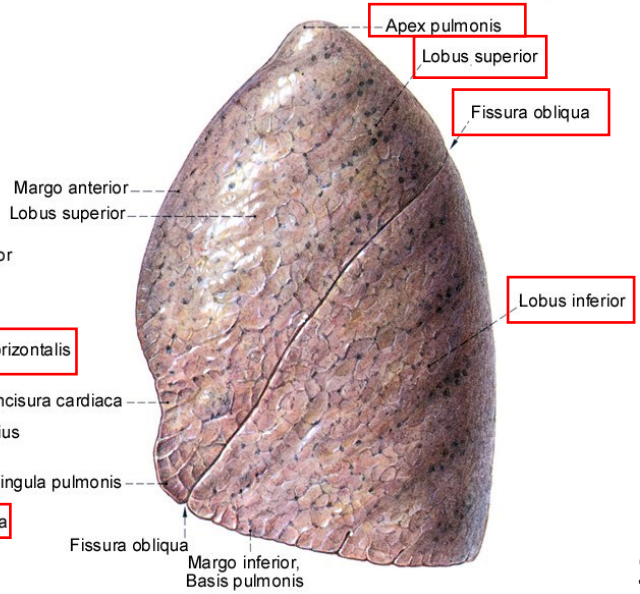


glatte Muskulatur



Lunge (Pulmo)





Lungenspitze *(Apex pulmonis)*

Einschnitten

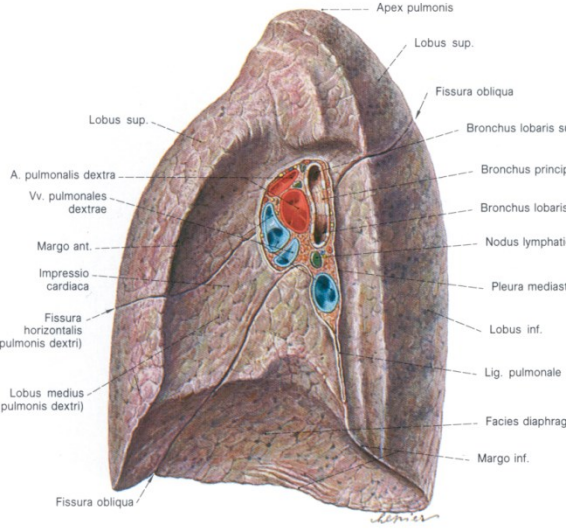
- *Fissura obliqua*
- *Fissura horizontalis*

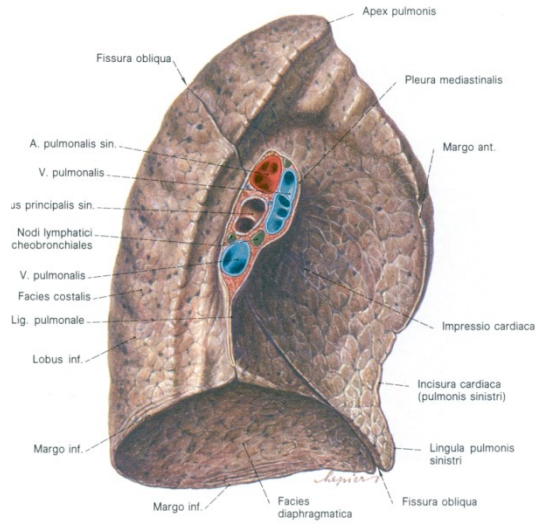
Lappen

- *Lobus superior*
- *Lobus medius*
- *Lobus inferior*

Lungenbasis *(Facies diaphragmatica)*

Seitenfläche *(Facies costalis)*



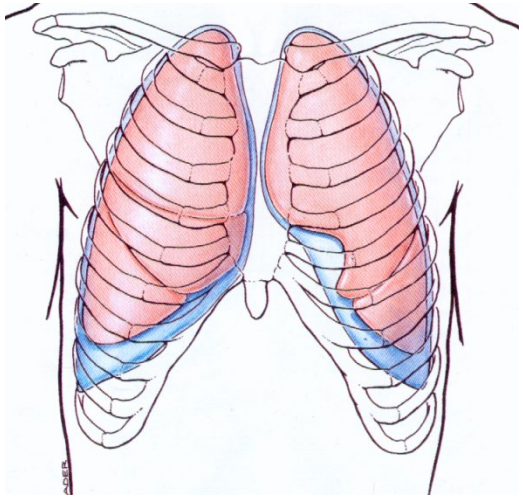


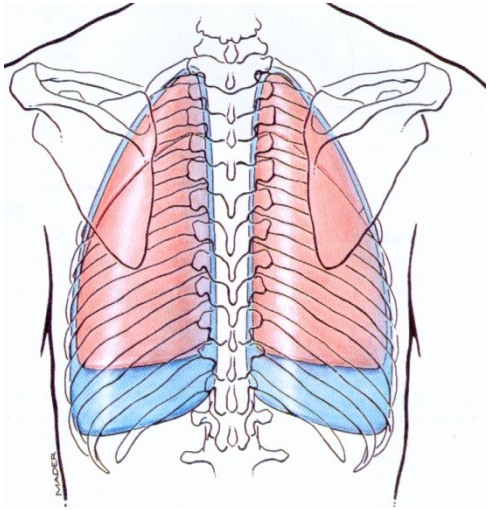
Lungenpforte *(Hilus pulmonis)*

Eindrücke

- *Impressio cardiaca*
- *Impressio costalis*
- *Impressio VCS*
- *Impressio v. azygos*
- *Impressio aortae*

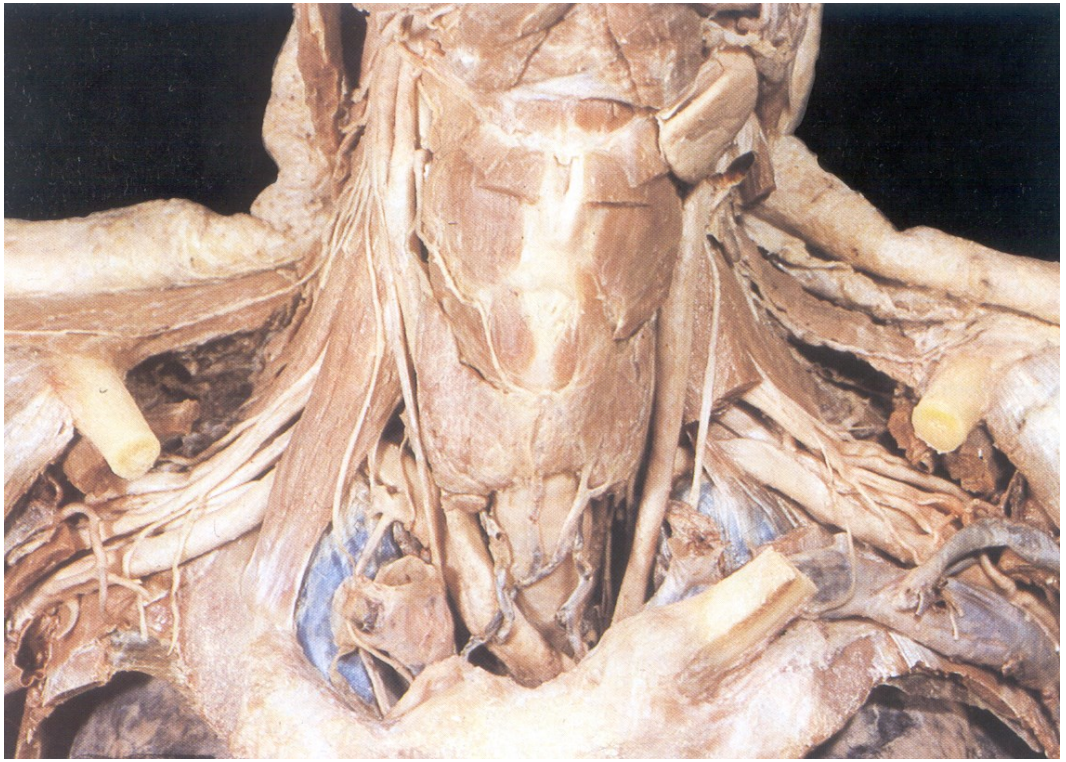
Brustfell (Pleura)



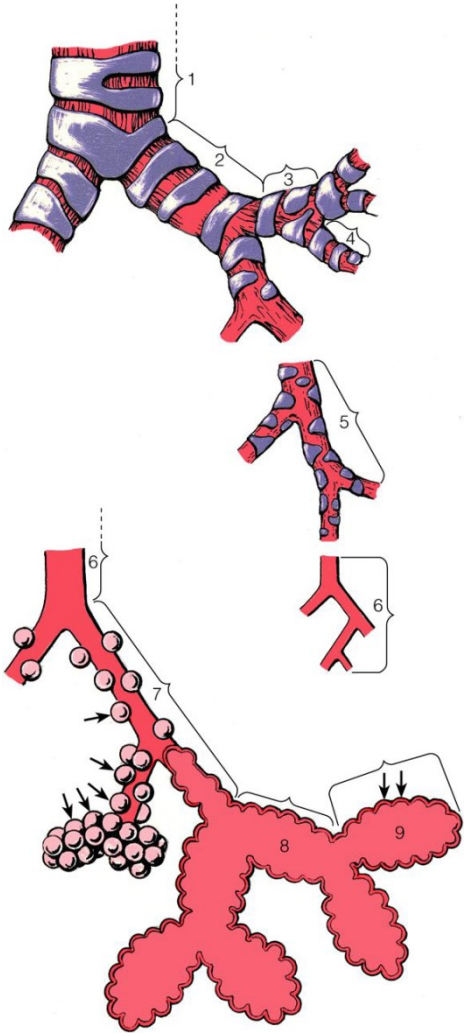


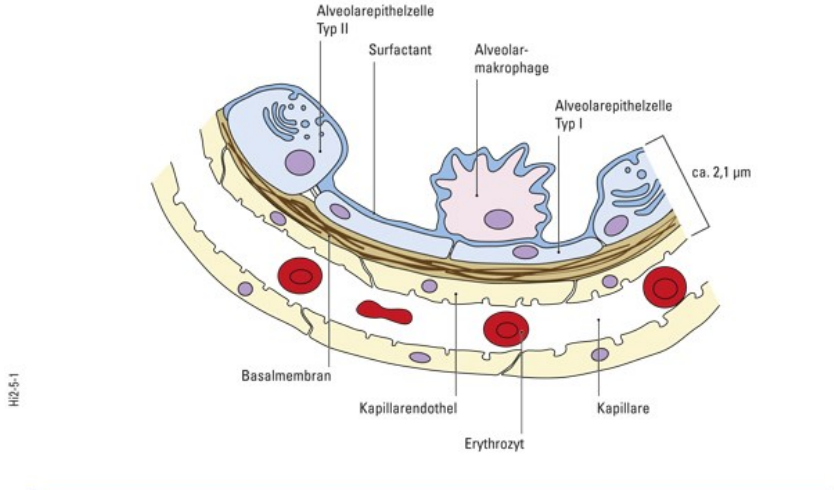
Parietale *(Pleura costlais, mediastinalis, diaphragmatica)* und viszcerale *(Pleura pulmonalis)* Blatt
Flüssigkeit *(Liquor pleurae)*

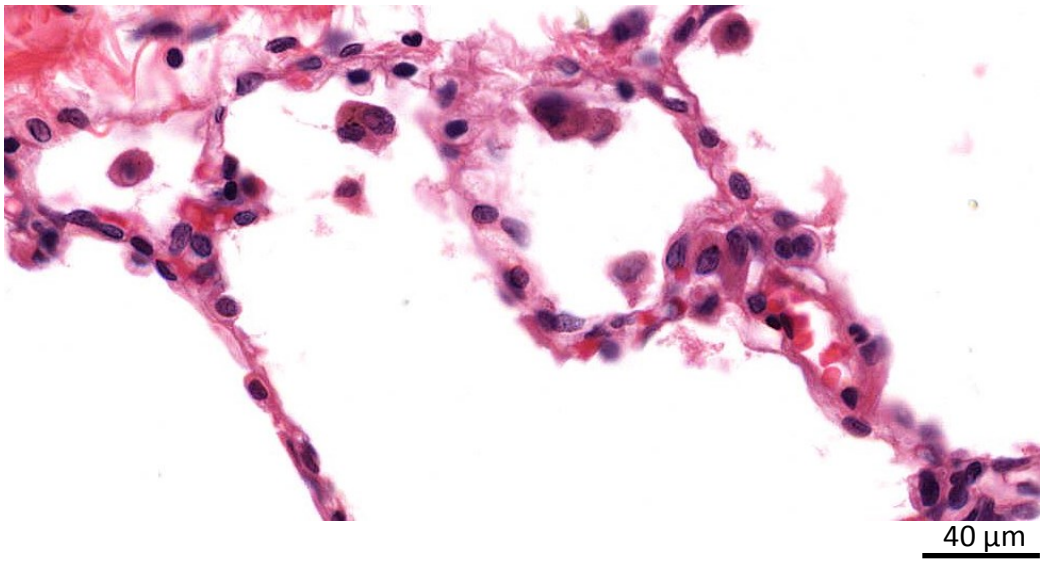
Pneumothorax
Pleuraerguss



Feinbau der Lunge

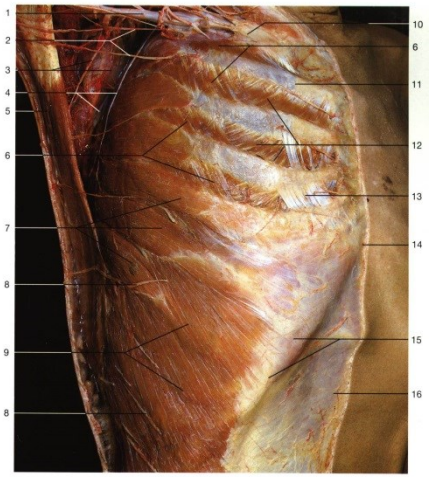




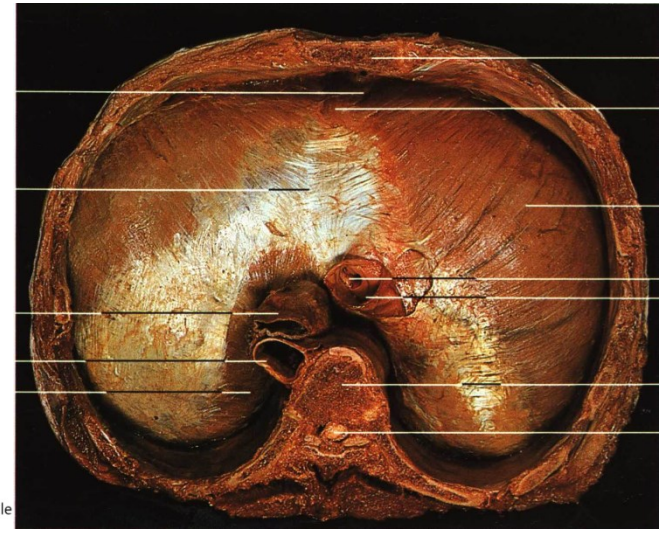


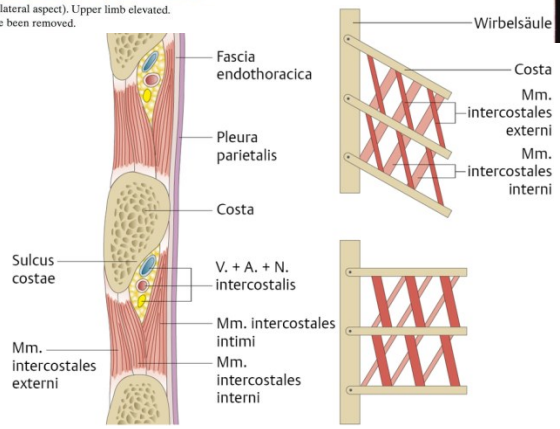
- Alveolen – Gasaustausch
- Blut-Luft Schranke
- Pneumozyten/Deckzellen (weniger als 0,1 µm dick)

Brustwand und Atembewegungen



Muscles of the thorax, superficial layer (lateral aspect). Upper limb elevated. Pectoralis major and minor muscles have been removed.





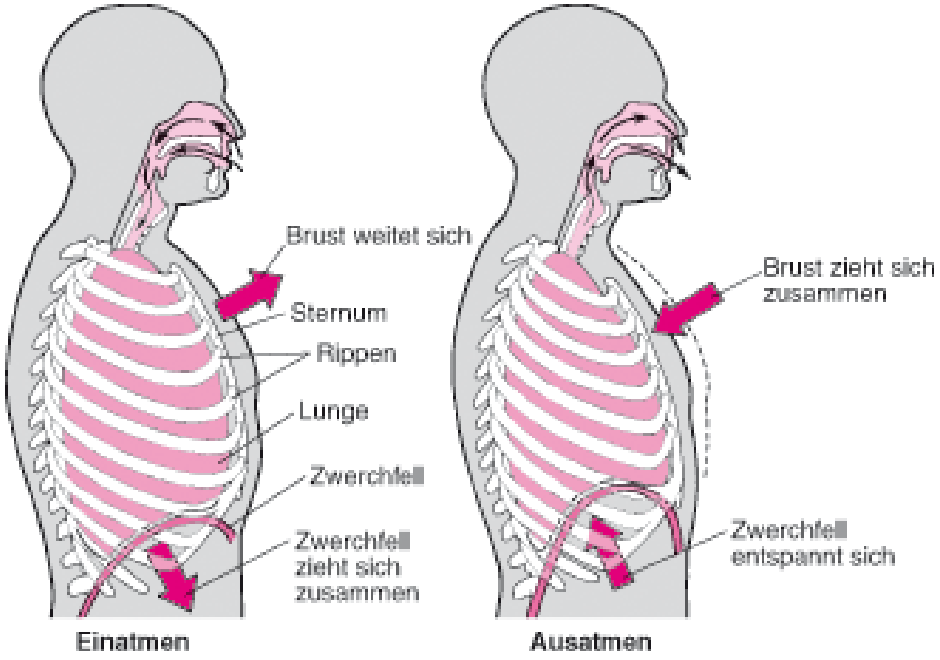
Brustkorb

- Brustbein *(Sternum)*
- Rippen *(Costae)*
- Wirbeln *(Vertebrae)*

Muskeln zwischen die Rippen

- *Musc. intercostales interni*
- *Musc. intercostales externi*

Zwerchfell *(Diaphragma)*



Hilfmuskeln:
M. pectoralis major
M. serratus anterior

Luftnot:
Streckte Armen
Nasenflügeln bewegen bei Atmung
M. sternocleidomastoideus ist gestreckt

Danke für die Aufmerksamkeit!

Literaturübersicht

Dr. Orsolya Kántor: Trachea, tüdő, pleura
Dr. Krisztina Minkó: Légzőrendszer

Yokochi: Color atlas of Anatomy
Kahle, Leonhardt, Plater: Taschenatlas der Anatomie
Faller: Anatomie in stichworten

http://surfingworld.tk/bei/die-atmung-bei-der-varikose.html
www.histologyguide.com
https://www.lifeline.de/symptome/atembeschwerden-atemgeraeusche-id62600.html