

Nasenhöhle.
Nasennebenhöhlen.
Kehlkopf.

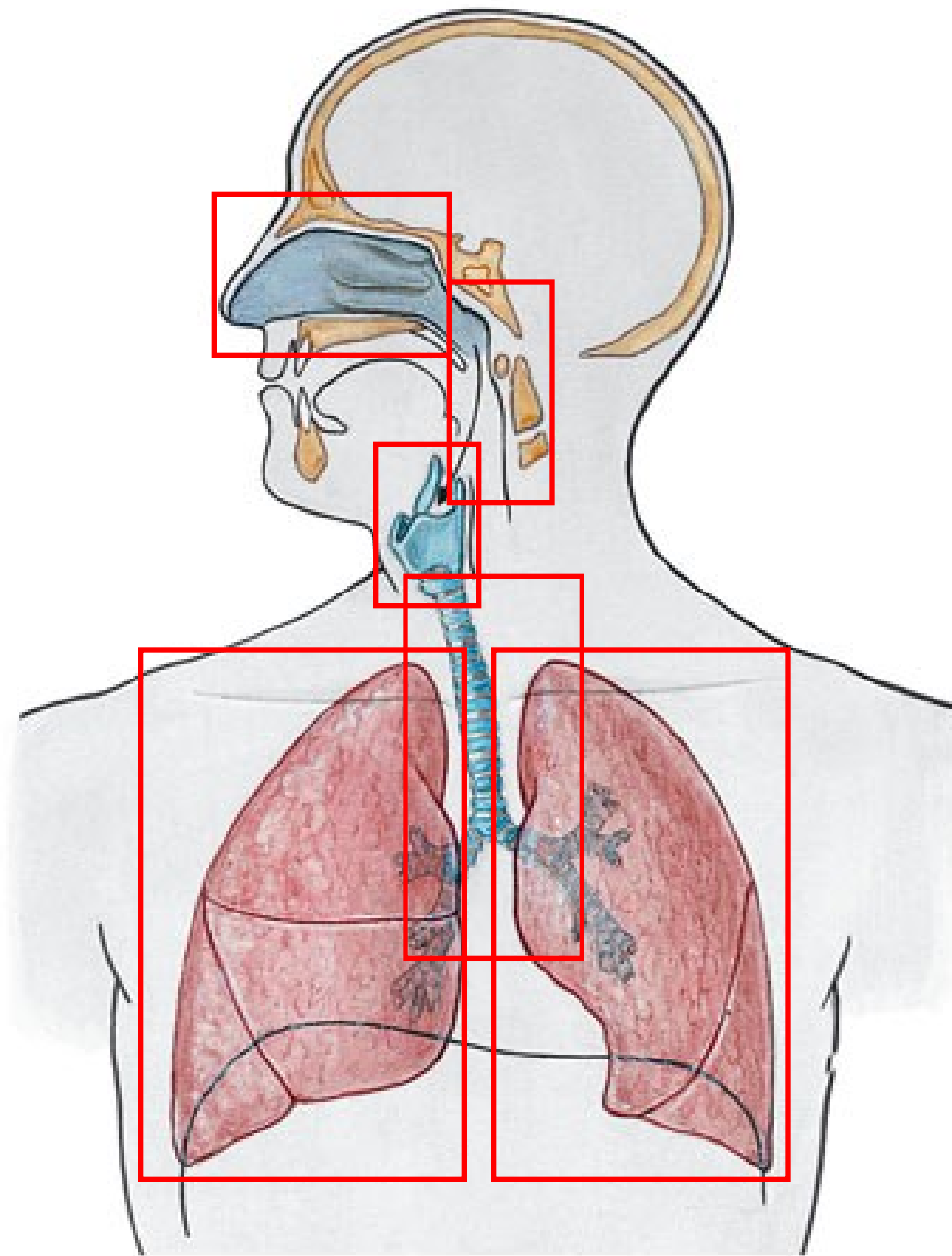
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Semmelweis Universität

Anatomisches, Embryologisches und Histologisches Institut

Atmungsorgane (*Apparatus respiratorius*)

- Gastransport
- luftleitende Atmungsorgane
- Stimmbildung



Luftwege:

-obere:

Nasenhöhle (*Cavum nasi*)

Nasennebenhöhle (*Sinus paranasalis*)

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

-untere:

Kehlkopf (*Larynx*)

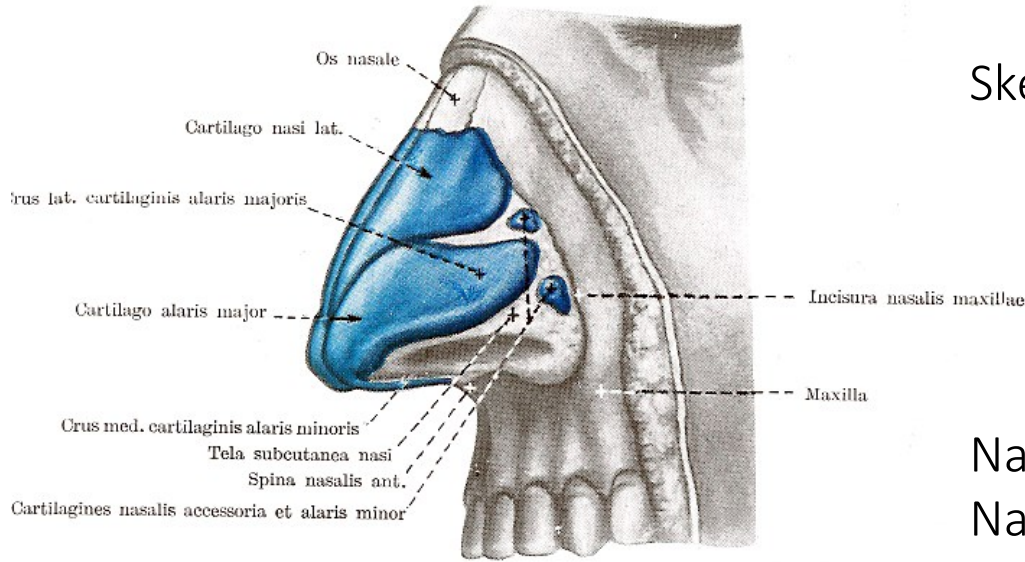
Luftröhre (*Trachea*)

Hauptbronchus (*Bronchus principalis dexter et sinister*)

Bronchialbaum (*Bronchi lobares, Bronchi segmentales, Bronchus, Bronchioli*)

Nasenhöhle, Nasennebenhöhlen

Aussere Nase (*Nasus externus*)



Skelett:

– Knorpel

Cart. nasi lateralis

Cart. alaris

Cart. septi nasi

– Knochen (*Os nasale*)

Nasenrücken (*Dorsum nasi*)

Nasenspitze (*Apex nasi*)

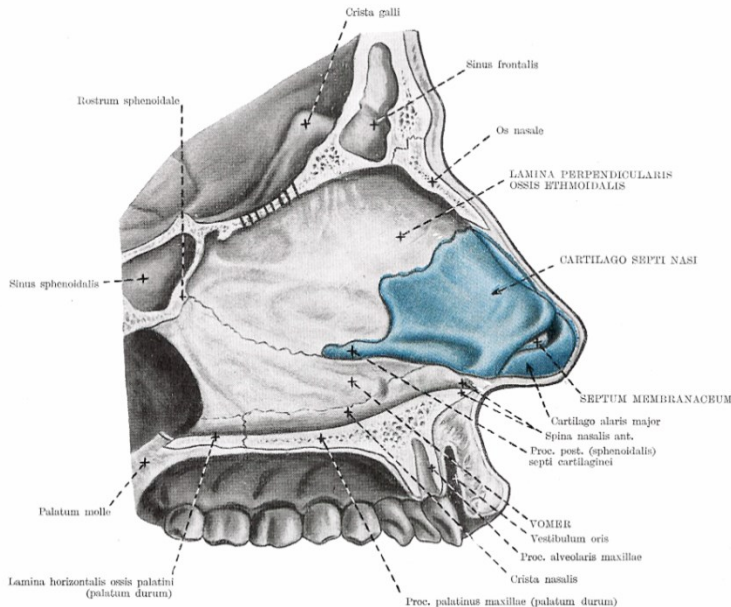
Nasenlöcher (*Nares*)

Nasenflügel (*Alae nasi*)

Nasenscheidewand (*Septum nasi*)

knorpelige Teil (*Pars cartilaginea*)

knöchern Teil (*Pars ossea*)

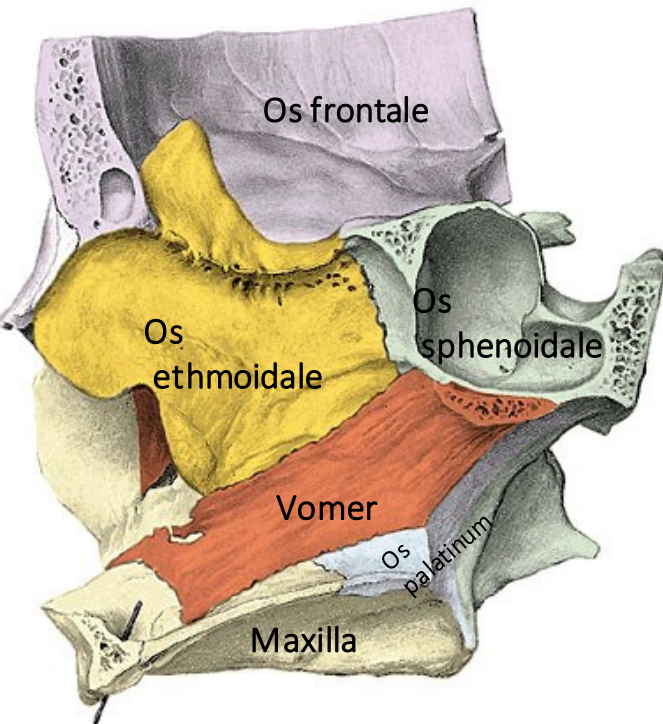


Haut (mimische Muskeln – Atemnot)

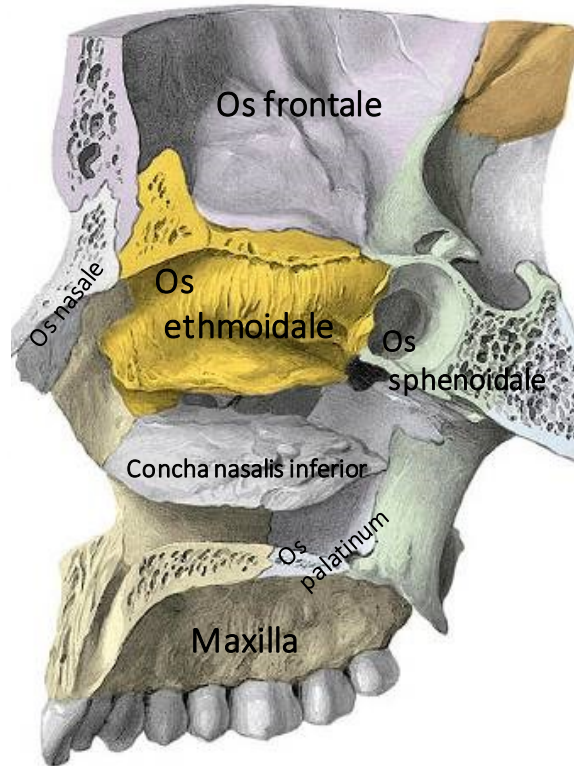
Nasenhöhle (*Cavum nasi*)

Reinigung, Vorwärmung (32-34 °C), Feuchtigkeit

Mediale Wand



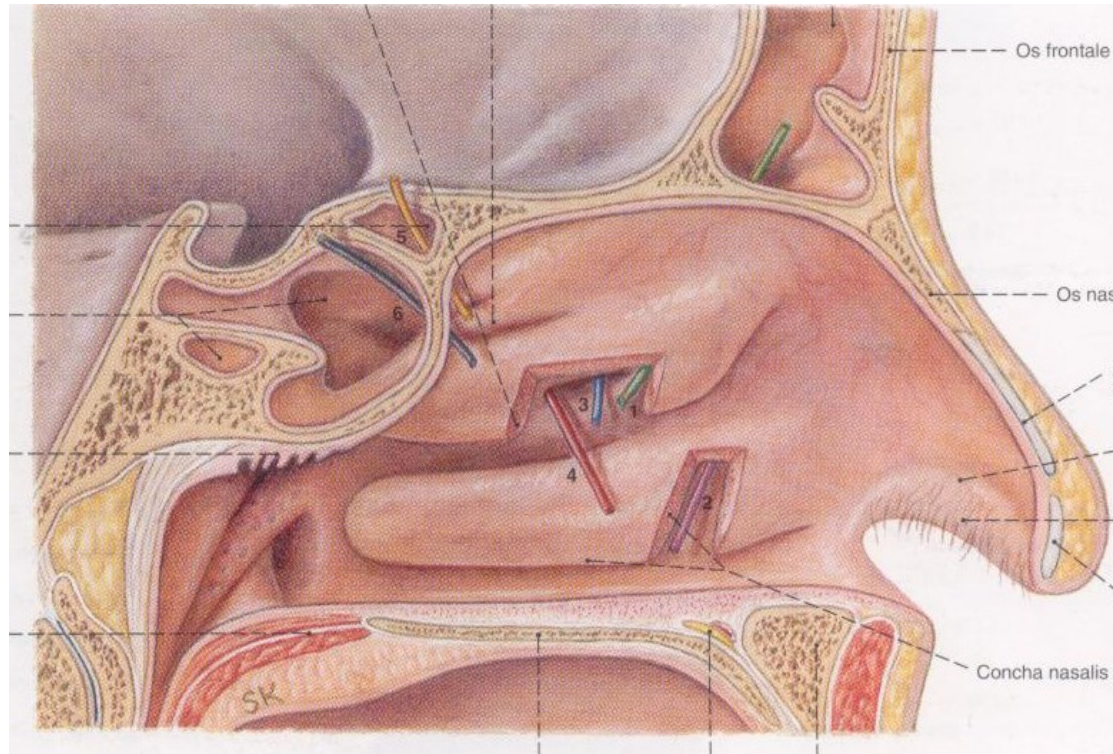
Laterale Wand



Frontalschnitt



Nasengänge



Meatus nasi communis

- Apertura piriformis
- Lamina cribrosa
- Canalis incisivus
- Foramen sphenopalatinum
- Apertura sinus sphenoidalis
- Choana

Meatus nasi superior

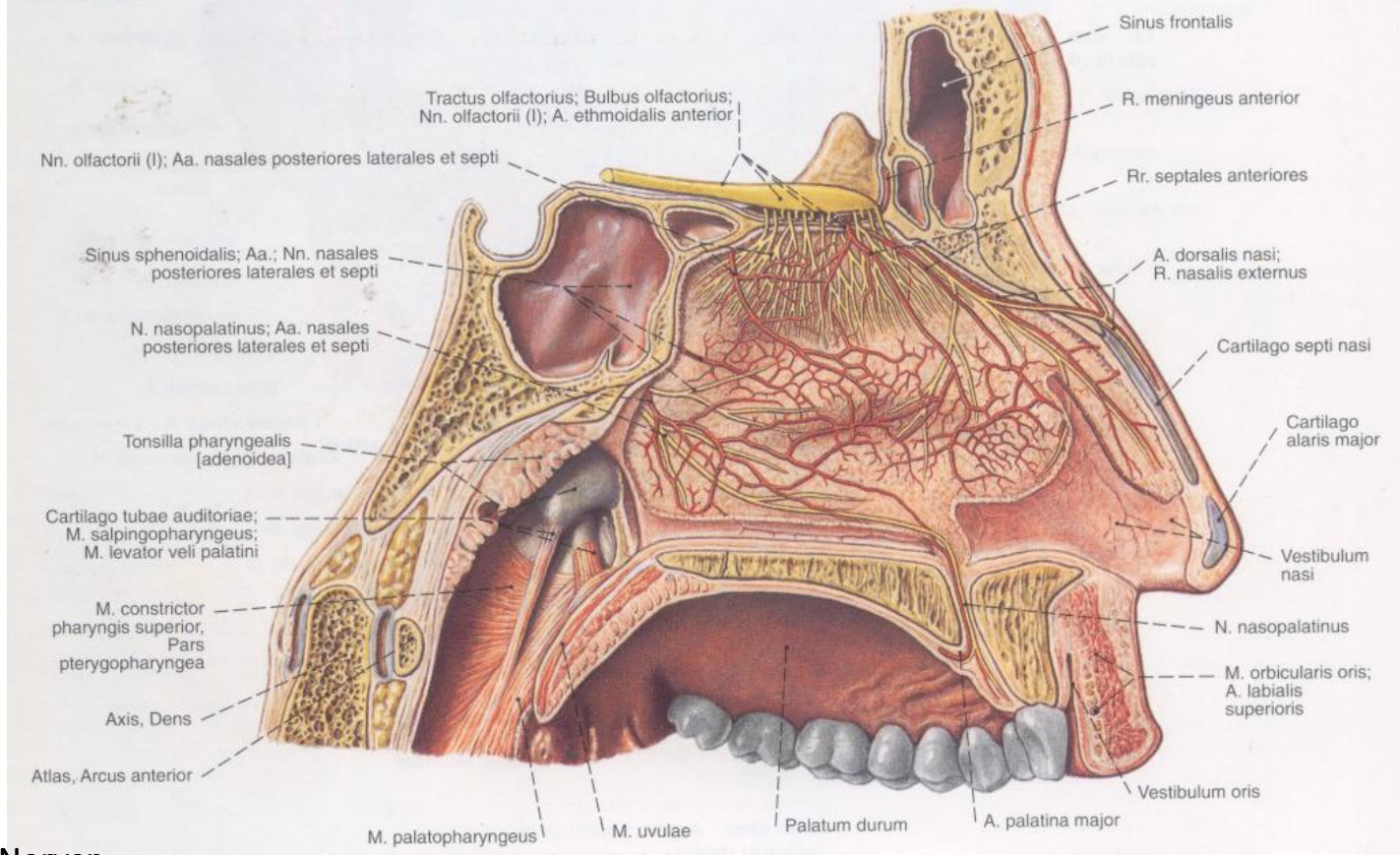
- Cellulae ethmoidales posteriores

Meatus nasi medius

- Cellulae ethmoidales anteriores et mediale
- Hiatus semilunaris
- Infundibulum ethmoidale, Apertura sinus maxillaris

Meatus nasi inferior

- Canalis nasolacrimalis



Gefäße und Nerven:

A. ethmoidalis anterior (A. ophthalmica)

N. ethmoidalis anterior (von nasociliare Ast von N. ophthalmicus)

A. sphenopalatina (A. maxillaris)

N. maxillaris rami nasales posteriores (N. trigeminus)

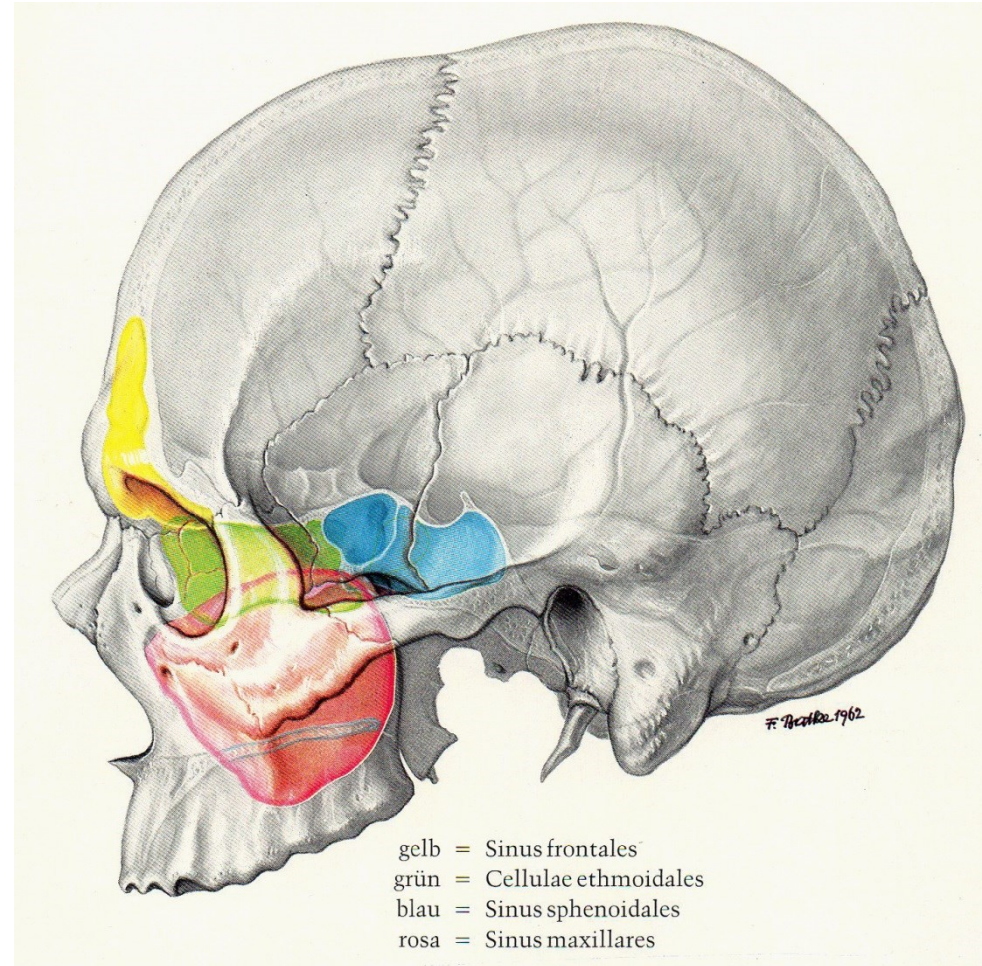
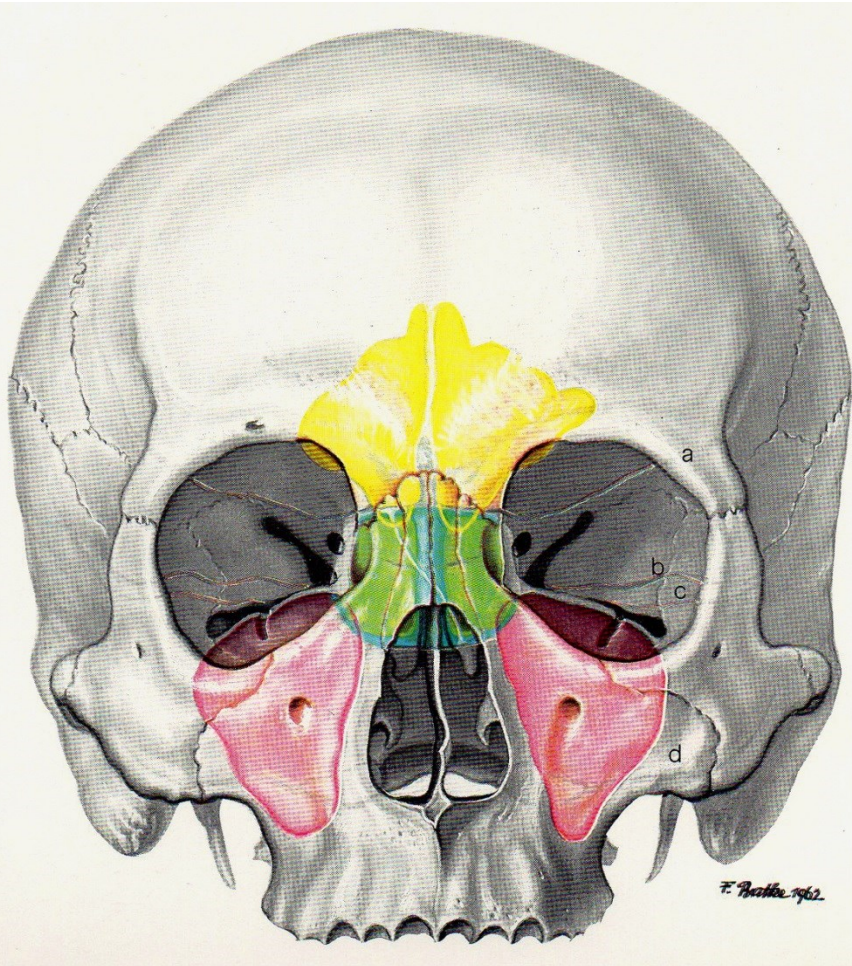
A. facialis (Locus Kisselbachi)

Plexus venosus pterygoideus et pharyngeus

Lymph:

submandibulare, retropharyngeale Lymphknoten und obere tiefe Lymphknoten von Hals

Nasennebenhöhlen (*Sinus paranasales*)



Kehlkopf (*Larynx*)

Knorpeln

Gelenke

Muskeln

Bindegewebiges Skelett

Schleimhaut

Kehlkopfskelett

Zungenbein

(*Os hyoideum*)

Kehlideckelknorpel

(*Epiglottis*)

Schildknorpel

(*Cart. thyroidea*)

Tracheakorpeln

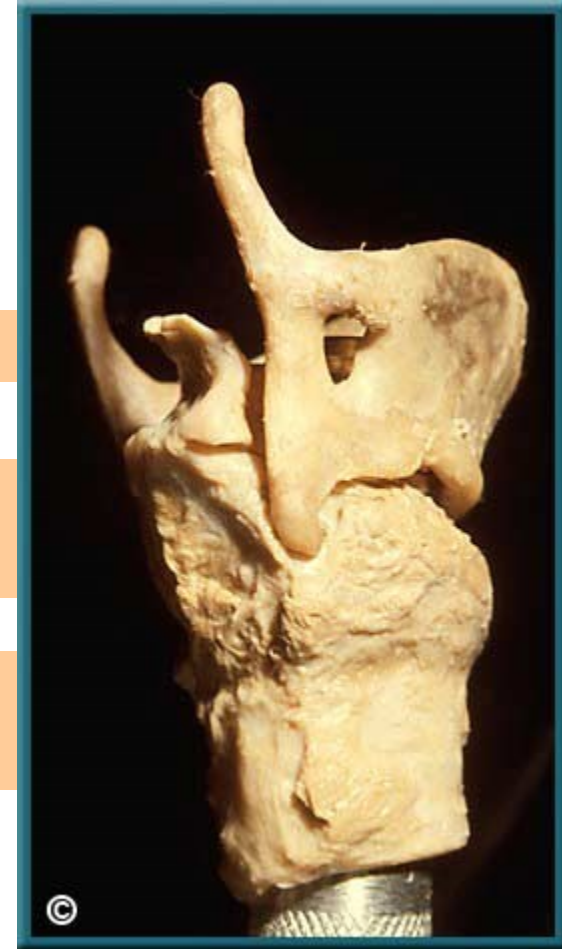
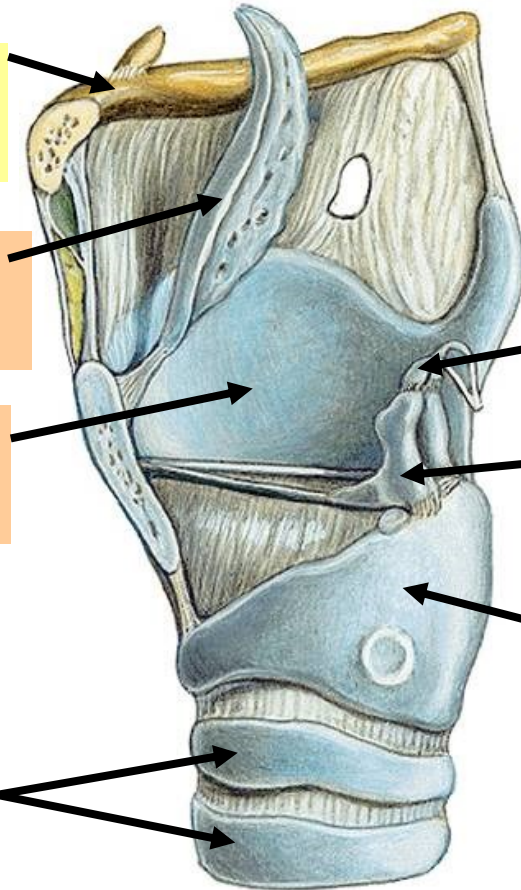
Cart. corniculata

Stellknorpel

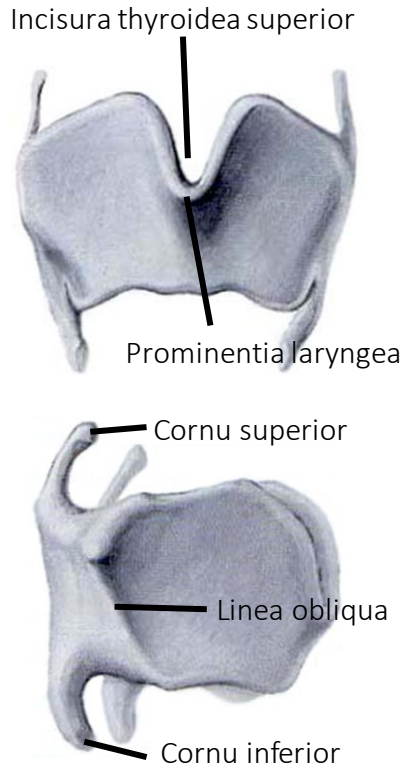
(*Cart. arytenoidea*)

Ringknorpel

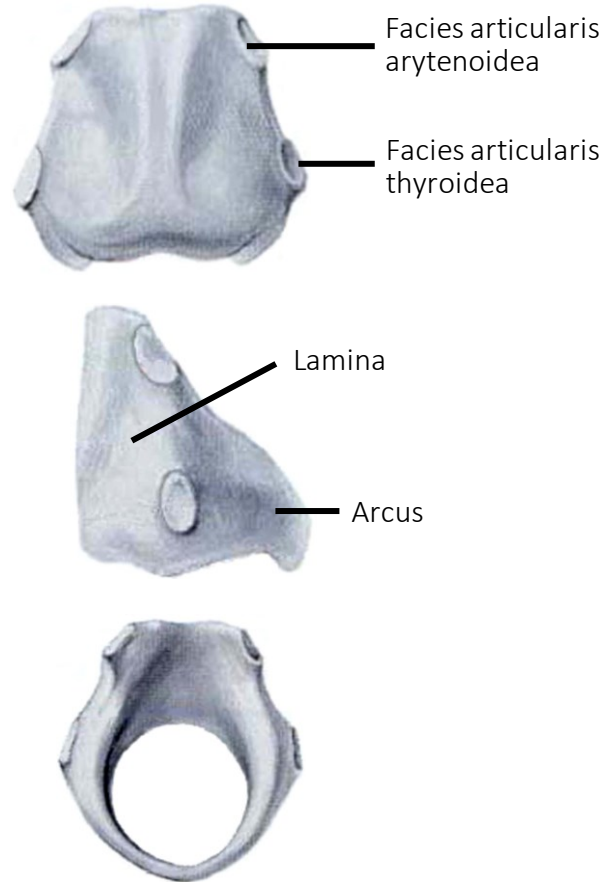
(*Cart. cricoidea*)



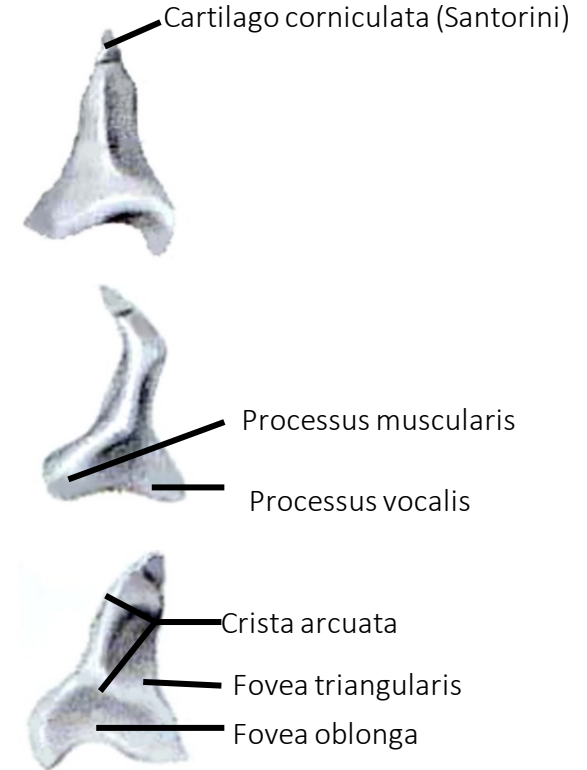
Schildknorpel
(*Cart. thyroidea*)



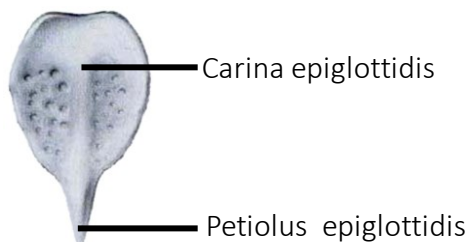
Ringknorpel
(*Cart. cricoidea*)



Stellknorpel
(*Cart. arytenoidea*)



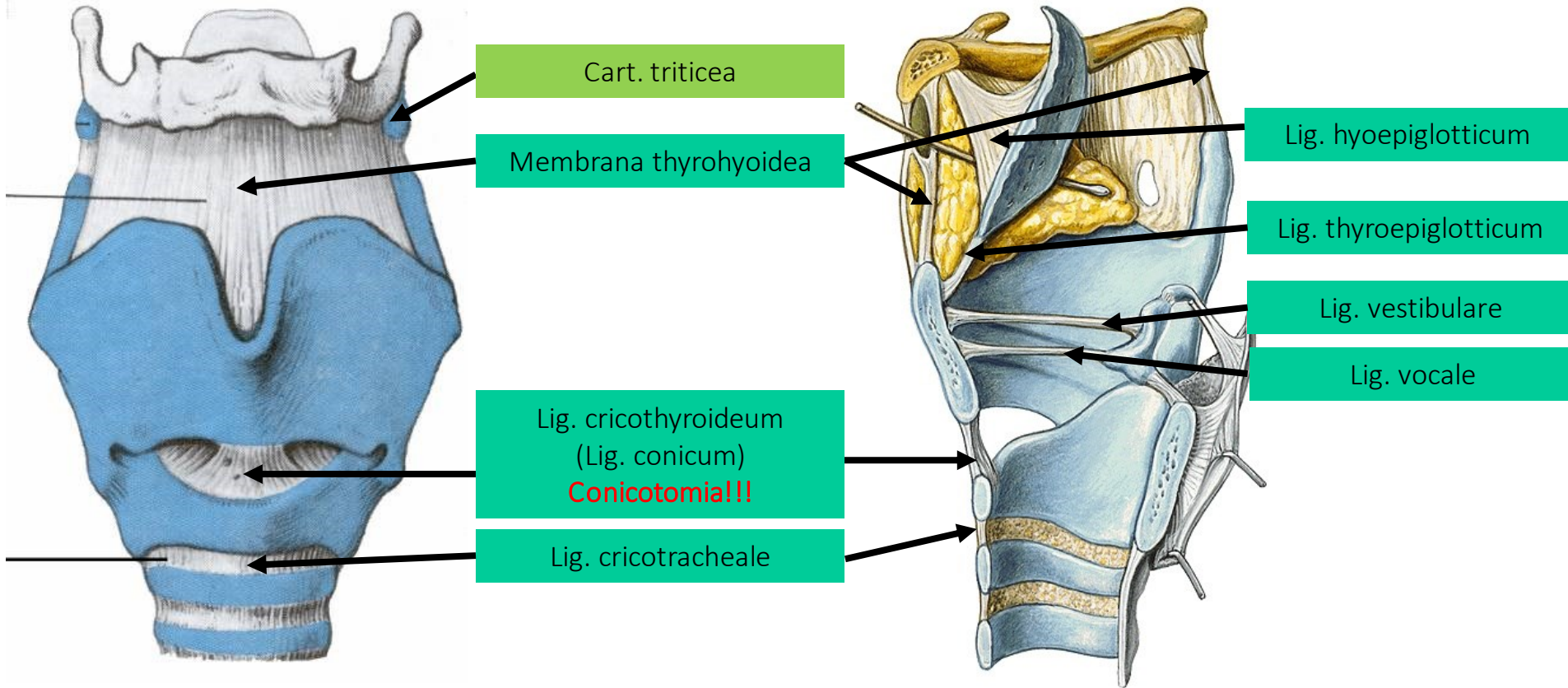
Kehldeckel (*Epiglottis*)



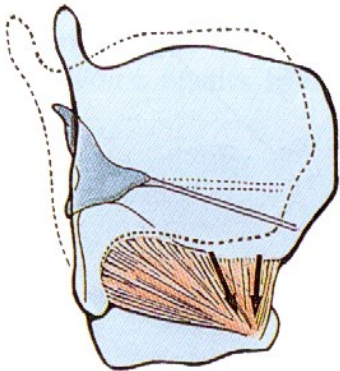
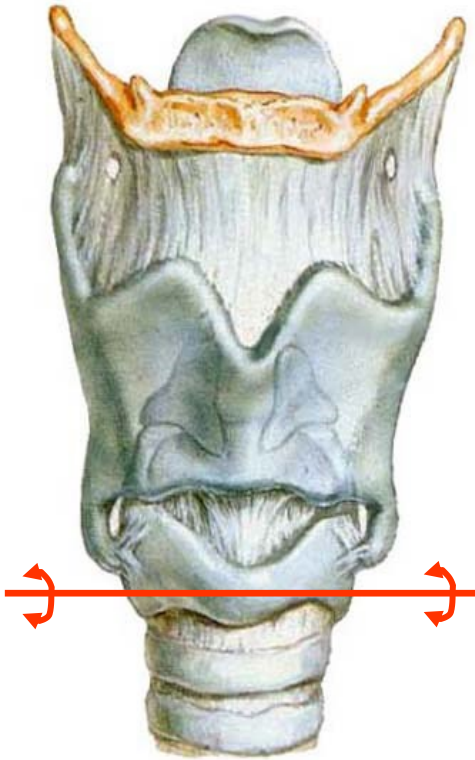
Cart. triticea

Cart. cuneiforme (Wrisberg)

Bändern



Articulatio cricothyroidea



Kopf: Cornu inferius cart. thyroideae
(Facies articularis cricoidea)

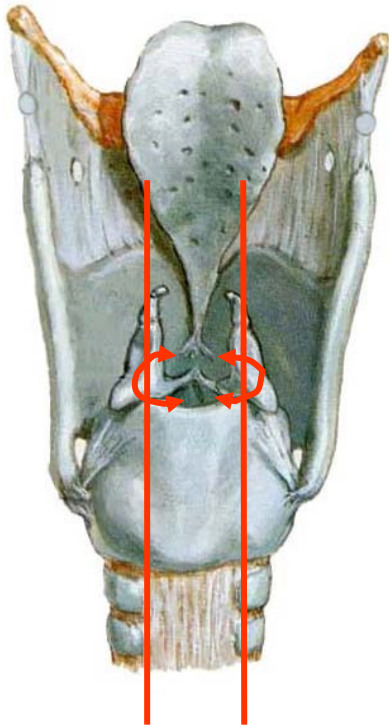
Pfanne: Facies articularis thyroidea cart. cricoideae
(zwischen Arcus und Lamina)

Bändern: vorne, hinten, seitlich

Typ: ginglymus – horizontale Achse

Aufgabe: Beeinflusst die Länge der Tonbänder -
Tonhöhe

Articulatio cricoarytenoidea



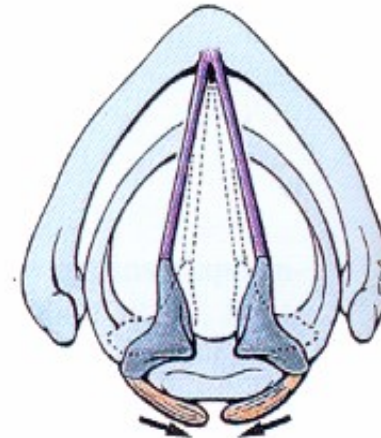
Kopf: Facies articularis arytenoidea cart.cricoideae

Pfanne: Facies articularis cricoidea cart.arytenoidei

Bändern: vorne und hinten

Typ: art. trochoidea – longitudinale Achse

Aufgabe: Öffnung und Schluss der Stimmritze



Muskeln

Länge und Spannung von Stimmband

M. cricothyroideus – spannt

Ursprung: Arcus von Cart. cricoidea

Ansatz: untere Kante von Cart. thyroidea

Innervierung: N. laryngus sup.

M. vocalis/ thyroarytenoideus medialis – feine Einstellung, Verhärtung von Stimmfalte

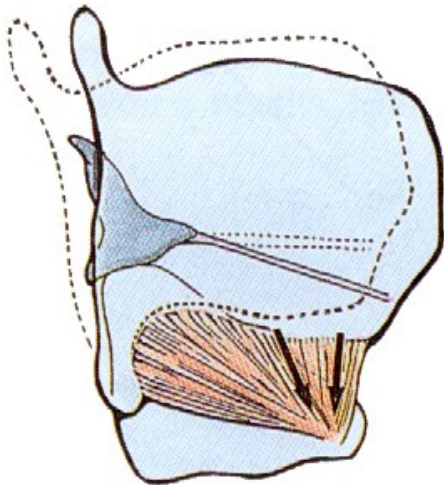
Ursprung: Cart. arytenoidea antero-laterale Seite

Ansatz: Lamina cartilaginosa thyroidea hintere Seite

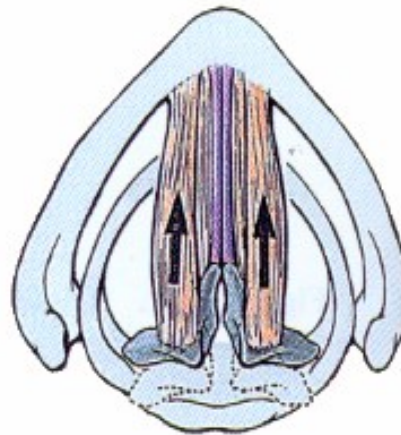
M. thyroarytenoideus – sphincterähnliche verengt das Raum über von Stimmritze

Ursprung: laterale Kante von Cart. arytenoidea

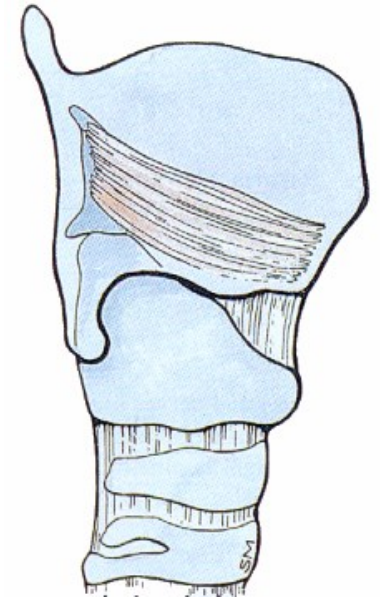
Ansatz: hinten an Lamina cartilaginosa thyroidea



M. cricothyroideus



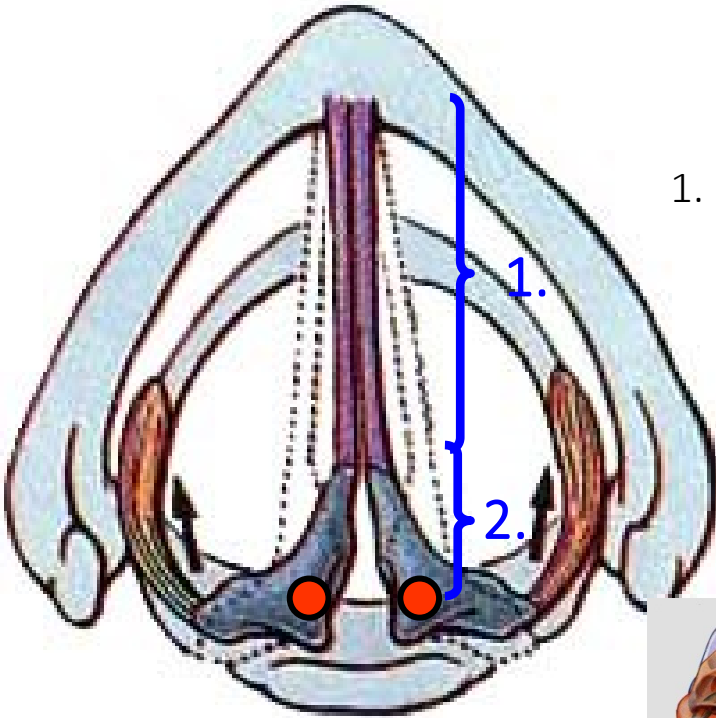
M. vocalis



M. thyroarytenoideus

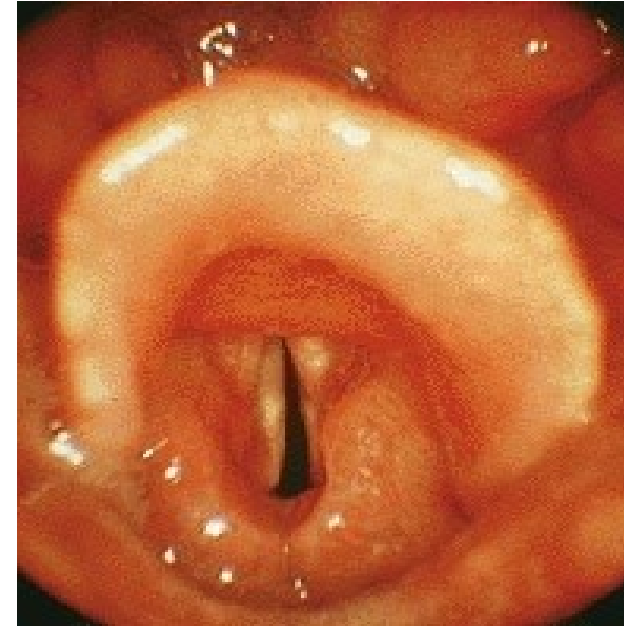
Rima glottidis

Zur Stimmbildung die Verengung von Stimmritze (*Rima glottidis*) ist nötig!



1. Pars intermembranacea/
interligamentosa

2. Pars intercartilaginea



Stimmritze

M. cricotomyideus posterior – erweitert die Stimmritze!

Ursprung: hintere Oberfläche von Cart. cricoidea

Ansatz: Cart. arytenoidea proc. muscularis

M. cricotomyideus lateralis – verengt die Stimmritze - pars membranacea

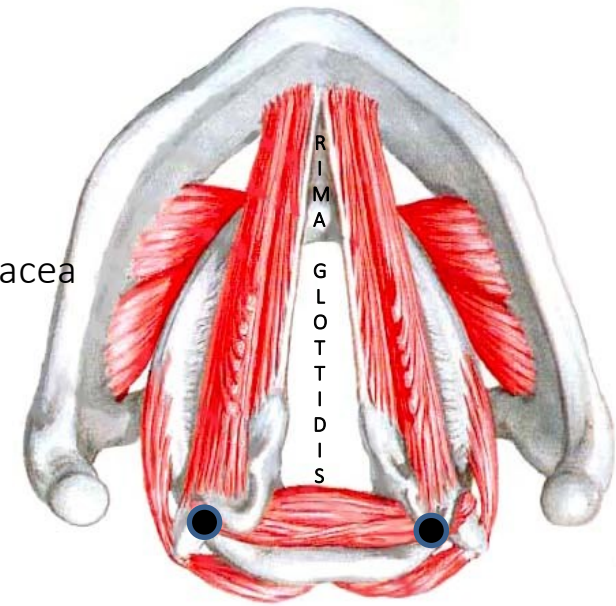
Ursprung: obere Kante von Arcus cart. cricoideae

Ansatz: Proc. muscularis cart. Cricoideae

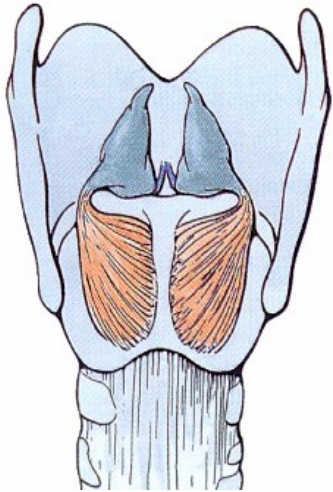
M. arytenoideus transversus
M. arytenoideus obliquus } verengt die Stimmritze
- pars intercartilaginea

Ursprung und Ansatz: Cart. arytenoidea

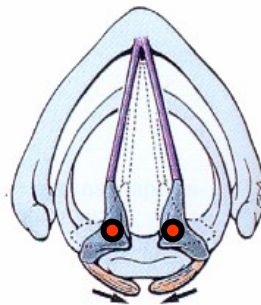
(vorne von Ebene von Art. cricoarytenoidea)



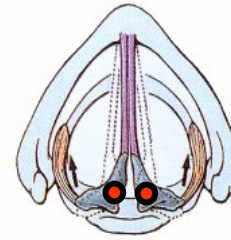
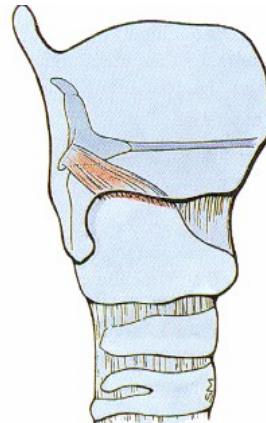
m. arytenoideus transversus
(schliesst P. intercartilaginea)



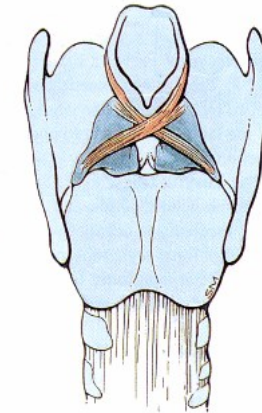
M. cricoarytenoideus posterior
(öffnet)



M. cricoarytenoideus lateralis
(schliesst P. membranacea)



M. arytenoideus obliquus
(schliesst P. intercartilaginea)



Verengung von Aditus laryngis:

M. aryepiglotticus

Ursprung: M. arytenoideus obl.

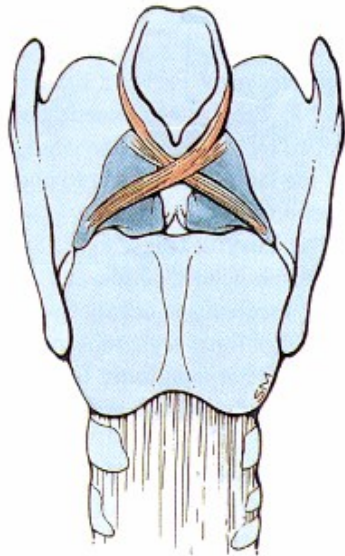
Ansatz: Plica aryepiglottica (Schleimhaut)

Erweiterung von Aditus laryngis:

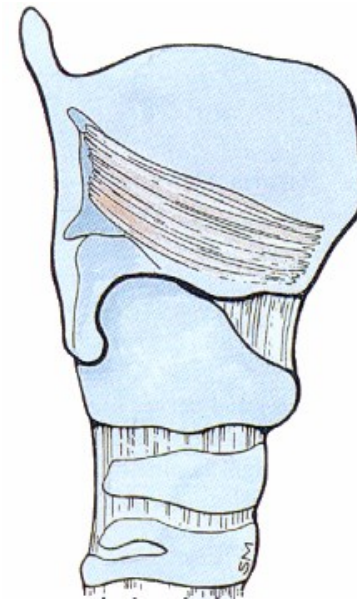
M. thyroarytenoideus (thyroepiglotticus)

Ursprung: M. thyroarytenoideus (lateralis)

Ansatz: Plica aryepiglottica (Schleimhaut)



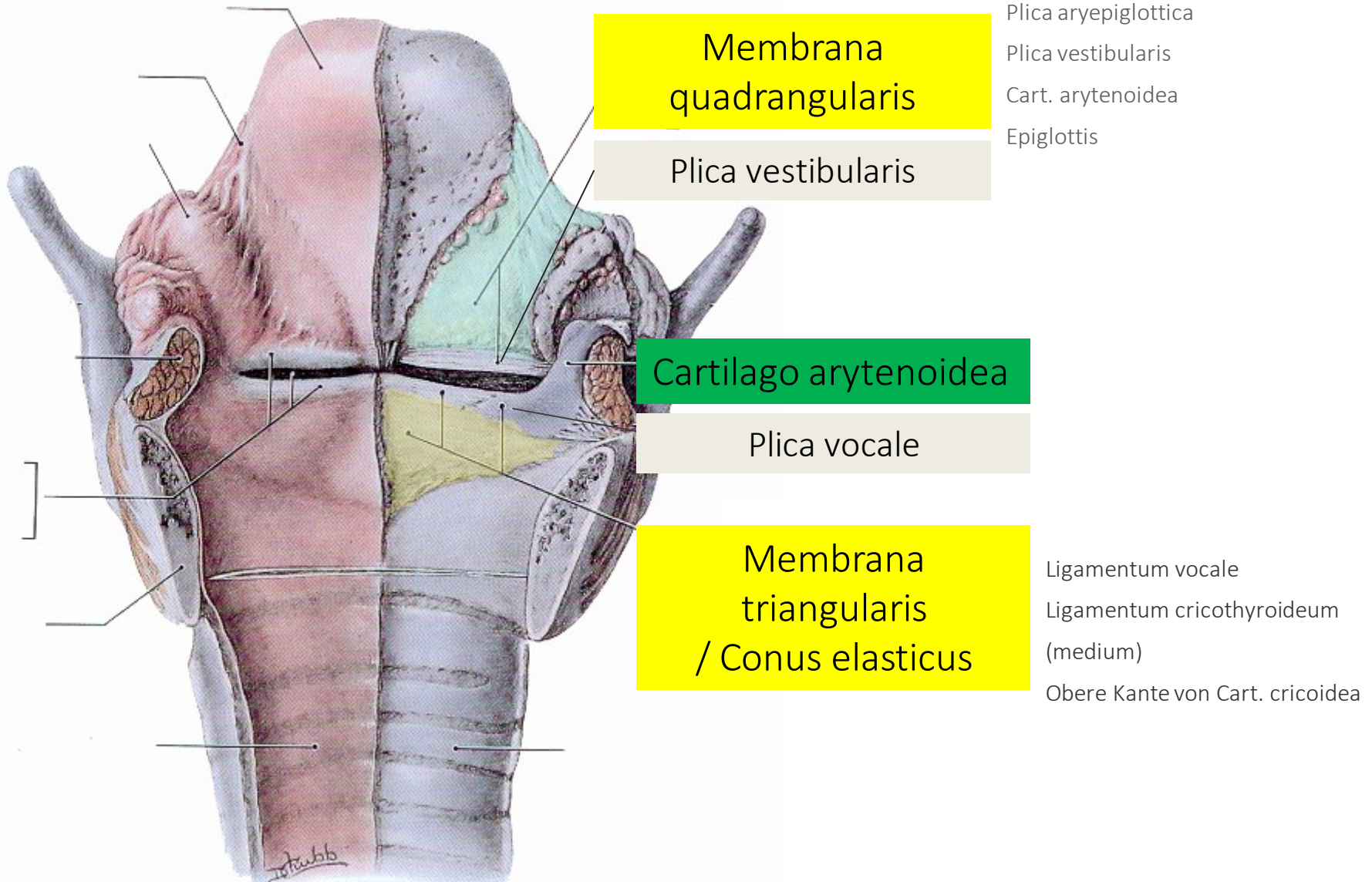
M. aryepiglotticus



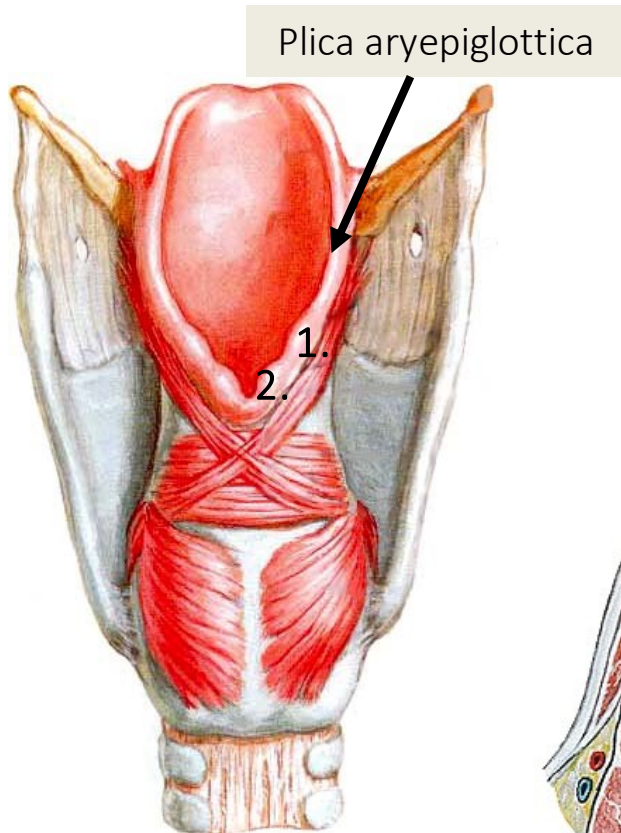
M. thyroarytenoideus
lateralis

Fibroelastisches Skelett

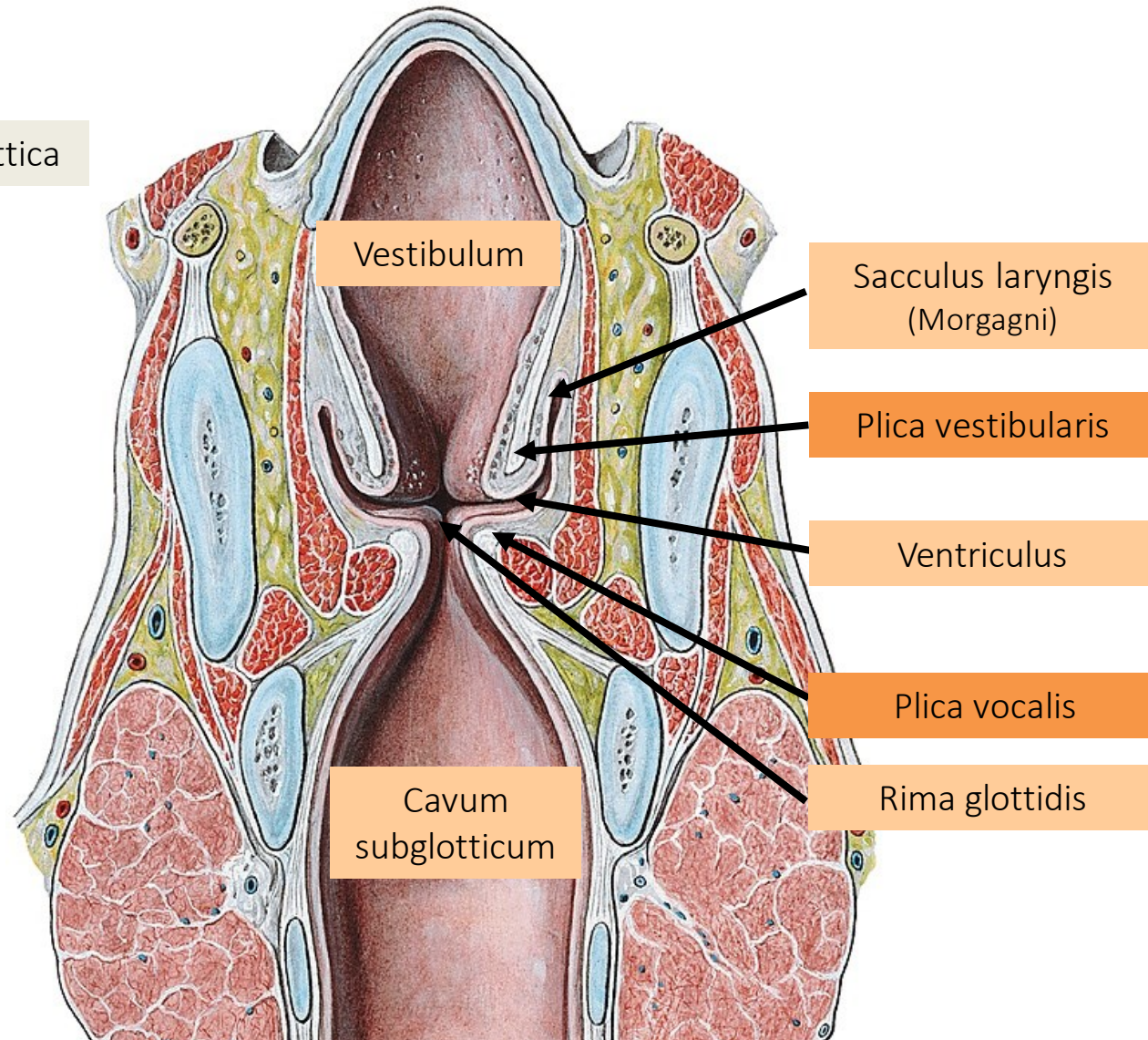
Membrana fibroelastica laryngis



Raum der Kehlkopf

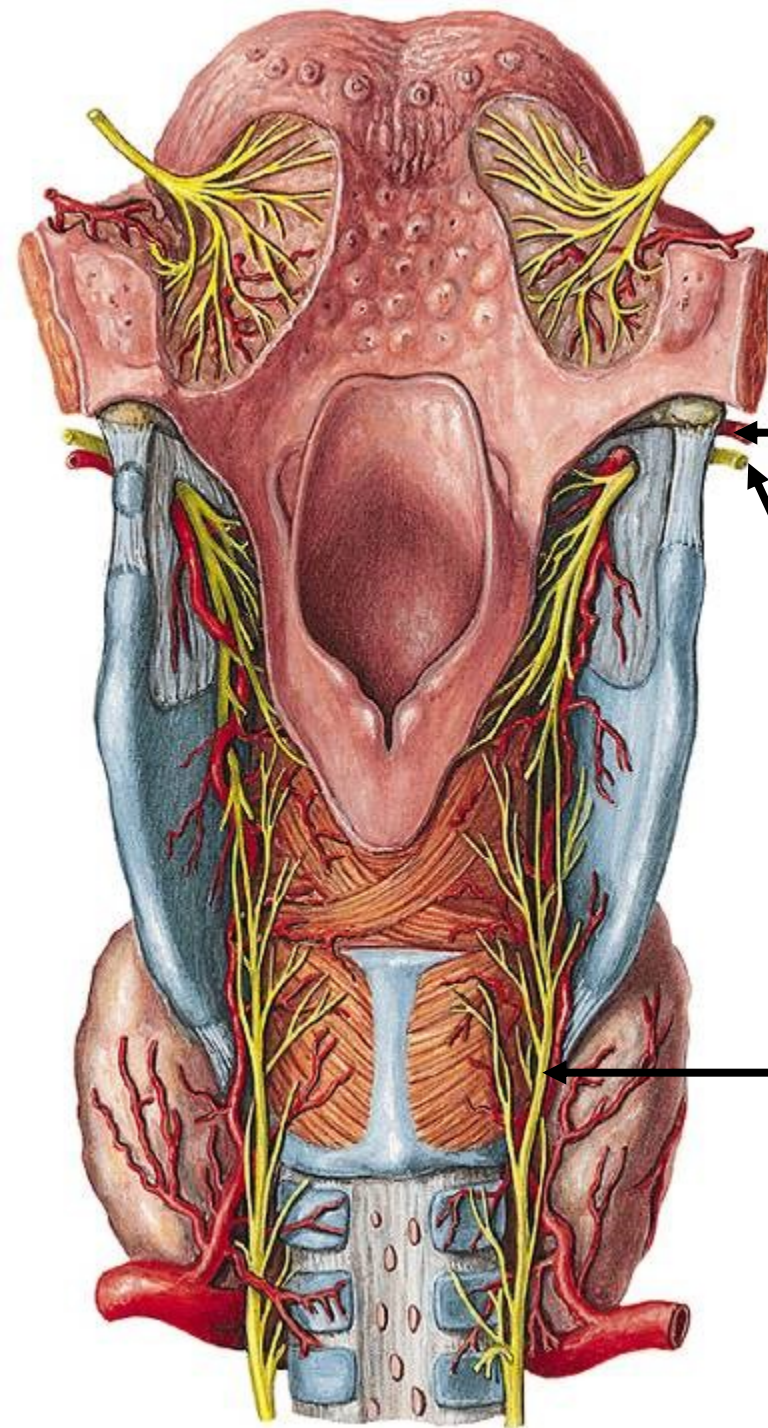


- 1.: tuberculum/cart. cuneiforme (Wrisberg)
- 2.: tuberculum/cart. corniculatum (Santorini)



Bei einer allergischen Reaktion ein Ödem kann die Atemwege bei Stimmritze verschliessen!

Gefäße und Nerven



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

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

V. laryngea sup.

V. laryngea inf.

N. laryngeus sup.

ramus externus

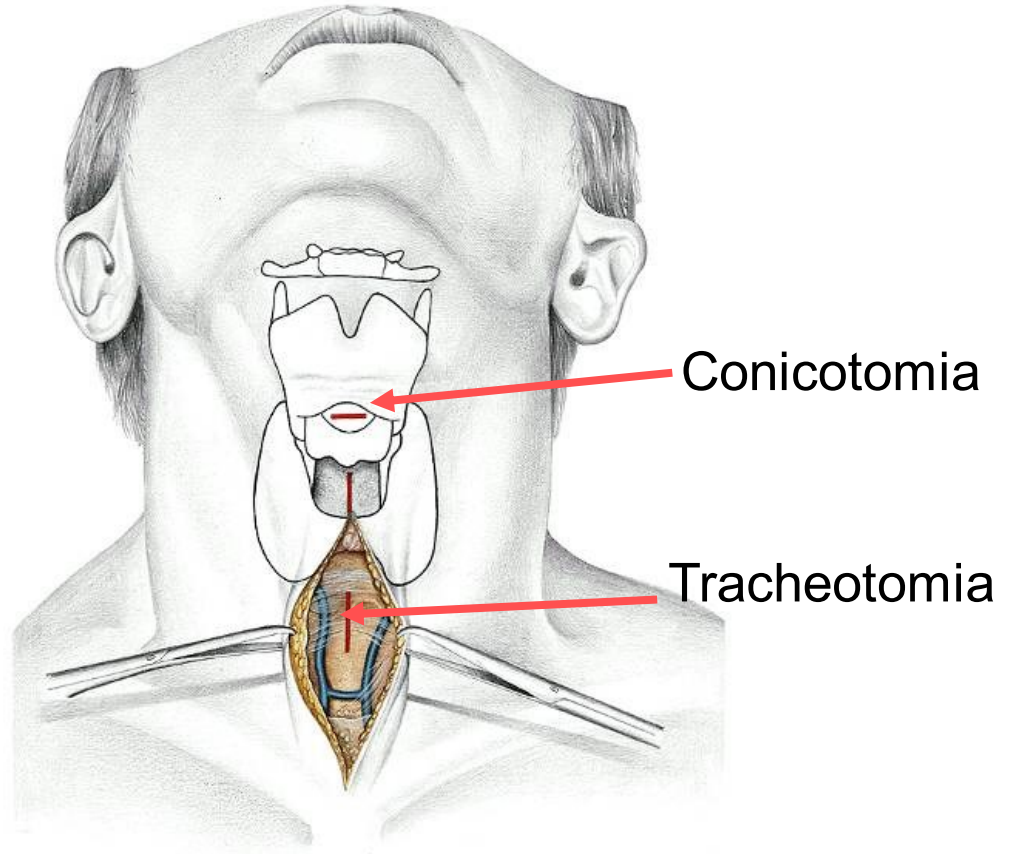
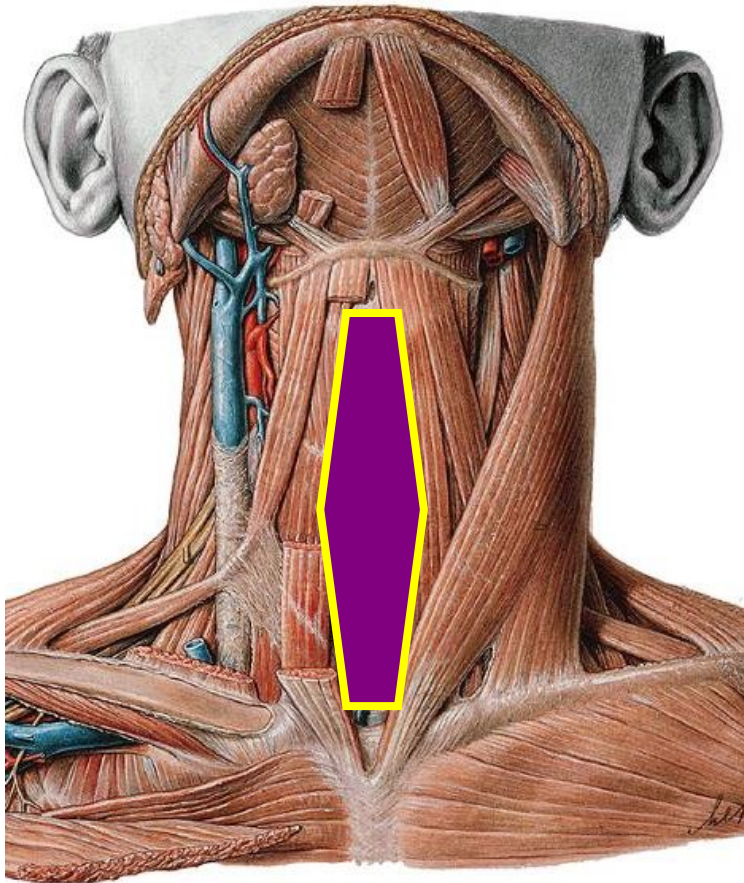
ramus internus

N. laryngeus inf. (Endast von N. laryngeus recurrens)

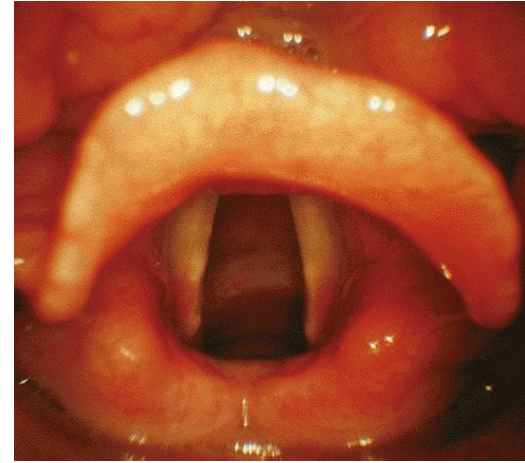
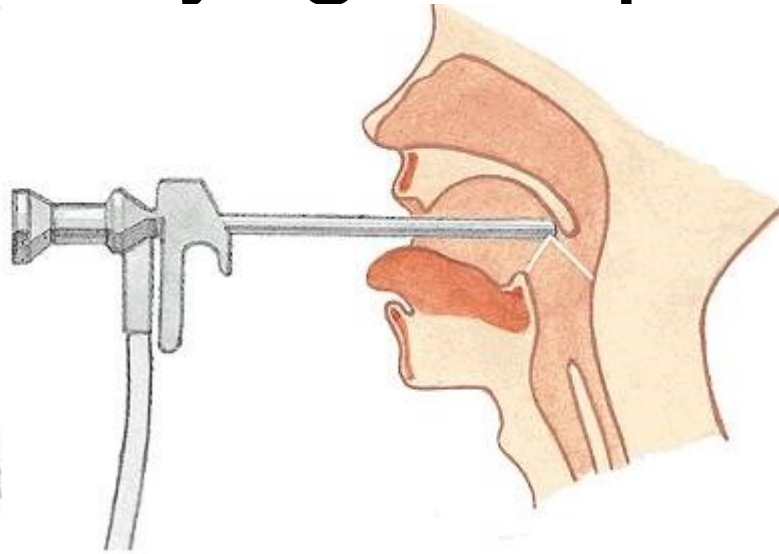
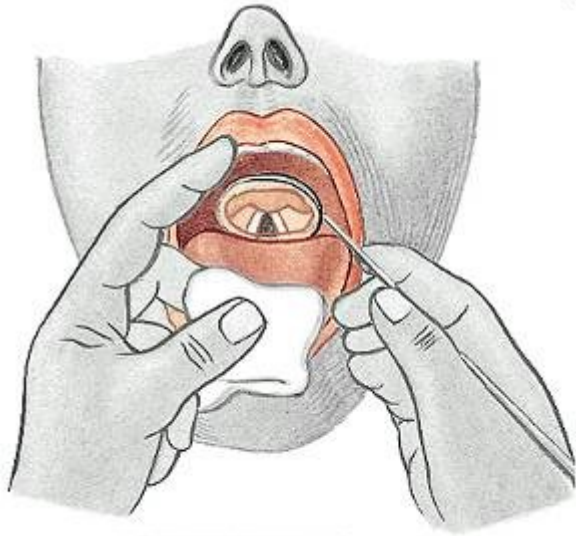
Veg. Nerven: N. vagus, Tr. sympathicus

Paratracheale Lymphknoten

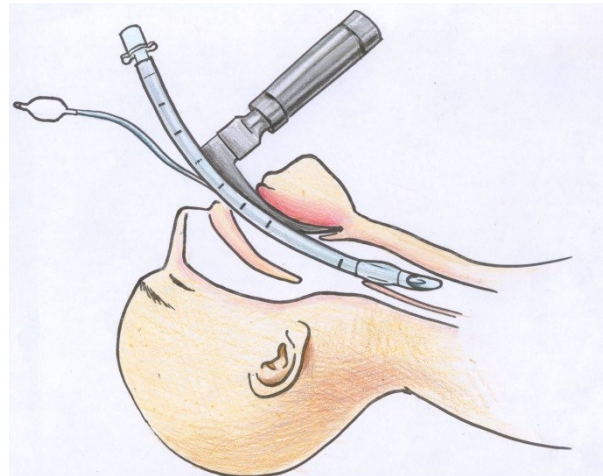
Regio colli mediana



Laryngoscopy



Intubation



Quellen

Dr. Herbert-Minkó Krisztina: Légzőrendszer

Dr. Kántor Orsolya

Dr. Székely Andrea: Larynx

Szenágothai, Réthelyi: Funkcionális anatómia
(Semmelweis Kiadó, 1994)

Pernkopf: Atlas der topografischen und angewandten
Anatomie des Menschen (Urban und Schwarzenbert,
1963)

Sobotta: Az ember anatómiájának atlasza (Urban és
Fischer, 2000)