

Anatomie der Kopf- und Halsbereiche *Bildgebende Verfahren*



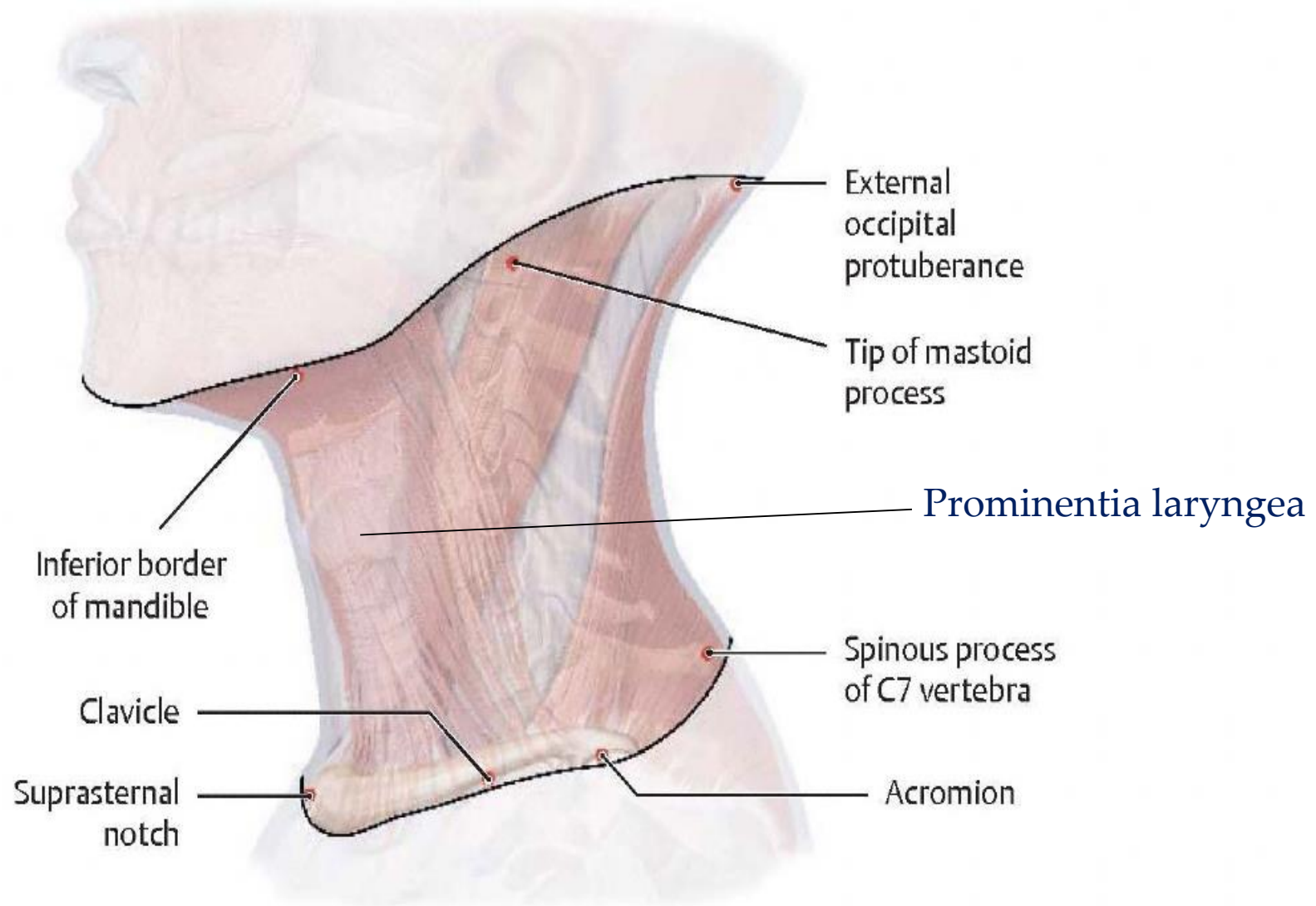
Ph.D, Dr. Lendvai Dávid

Anatomie, Histologie- und Embriologie Institut
2019.



Allgemeine Aspekte

Die Grenzen des Halses

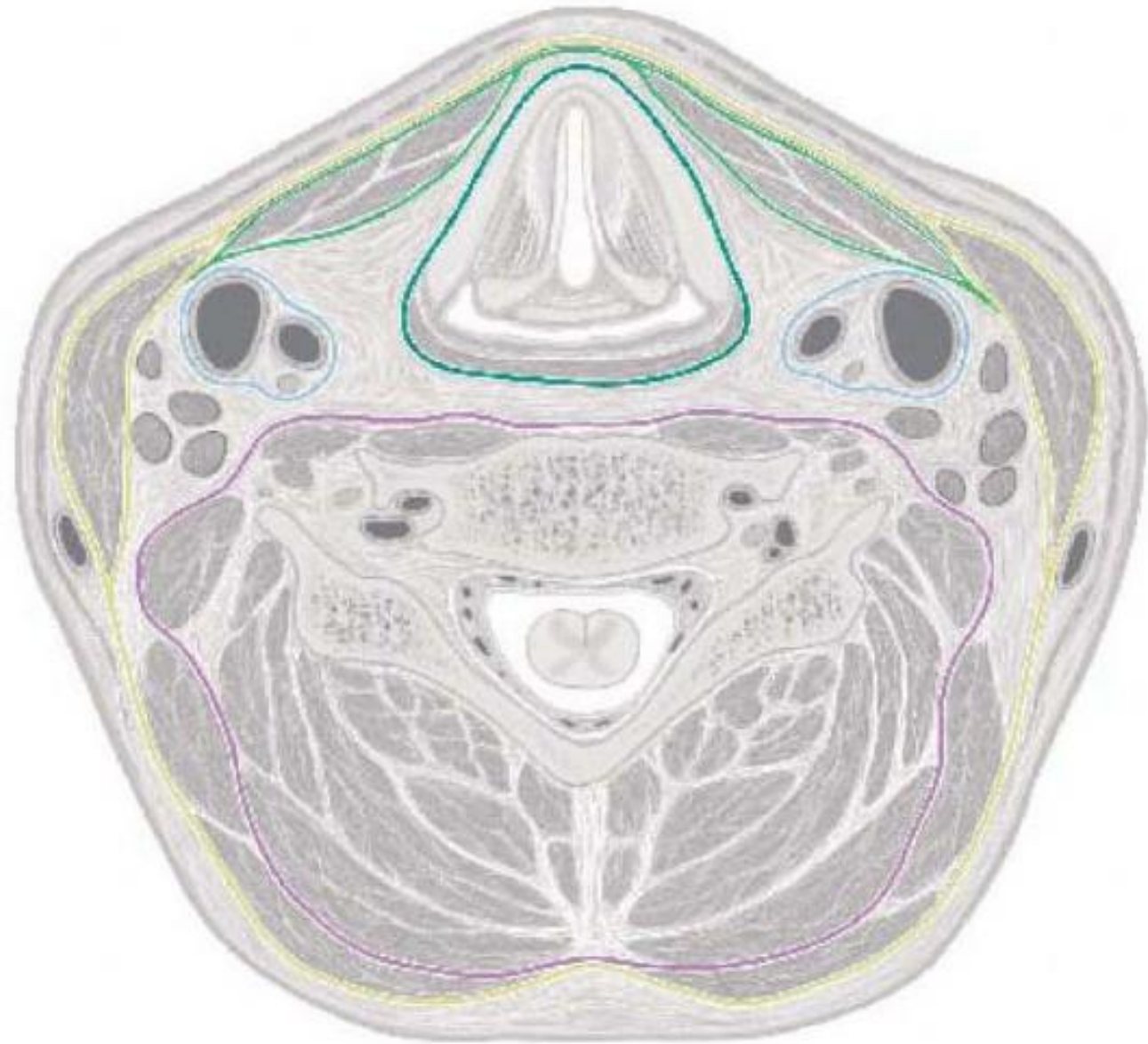




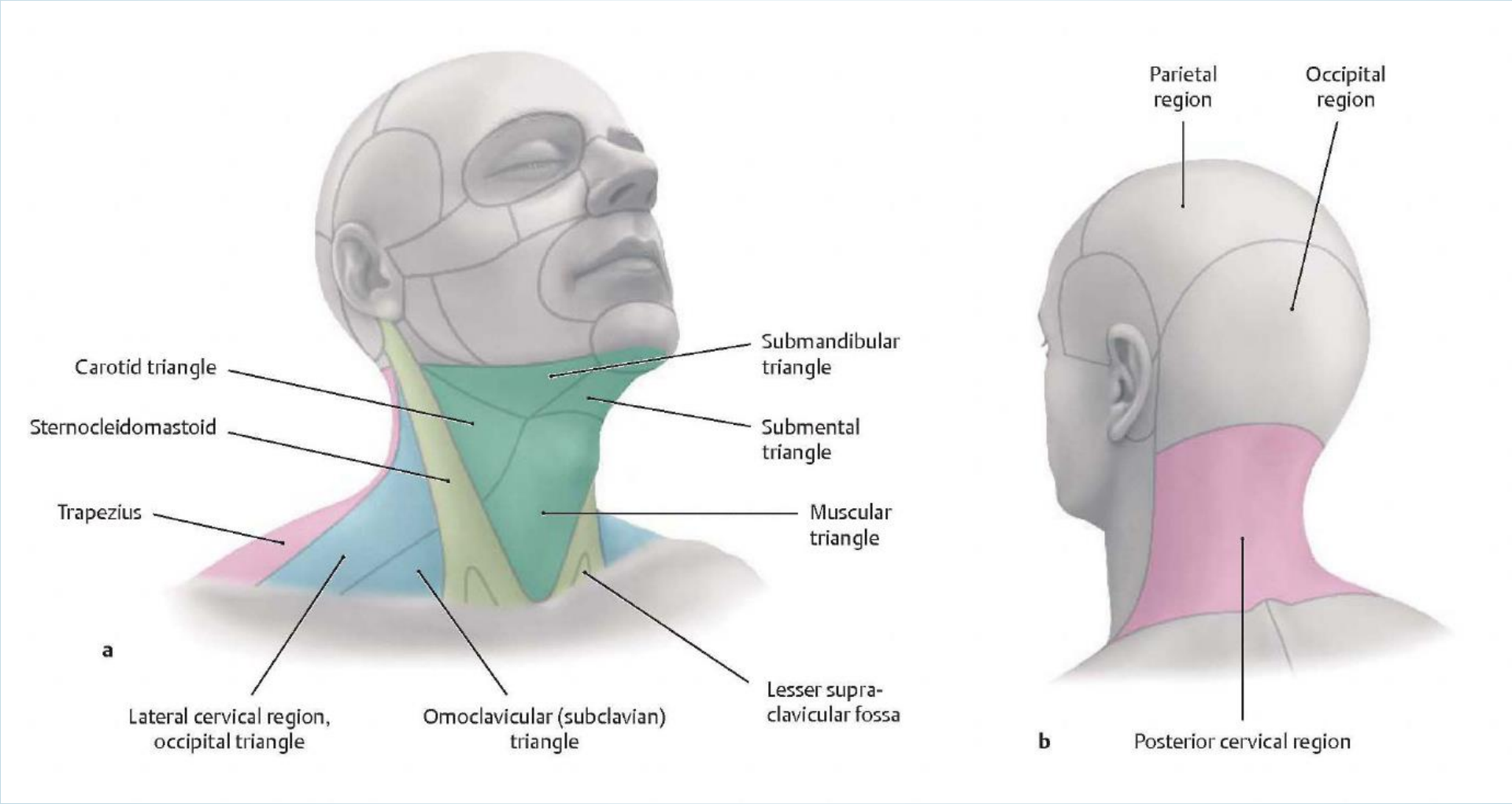
TOP 30

MISS TIFFANY'S UNIVERSE 2017





Halsdreiecke:



Trigonum submandibulare:

GRENZEN:

m digastricus

corpus mandibulae

BODEN:

mylohyoideus und hyoglossus

Trigonum submentale:

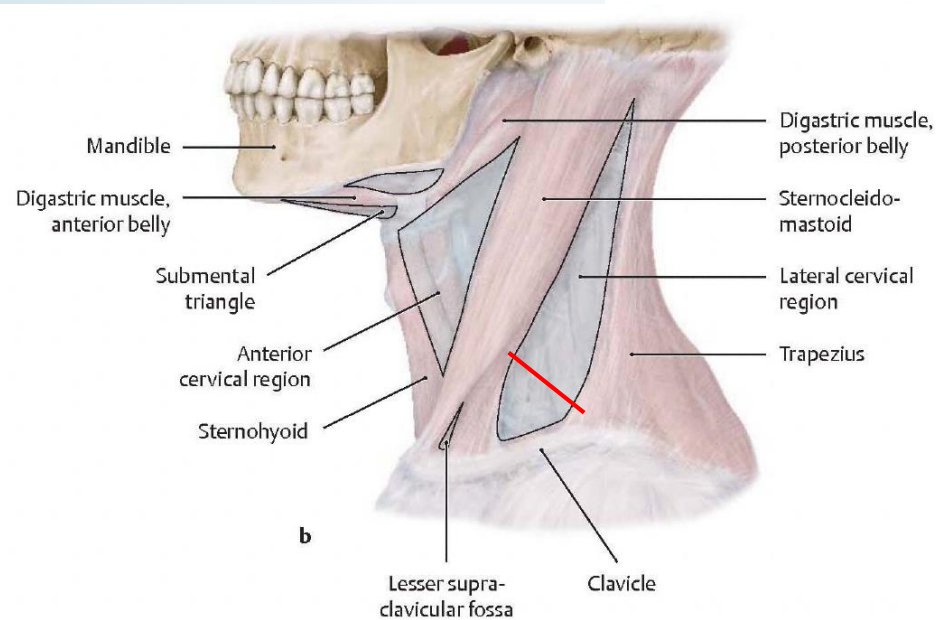
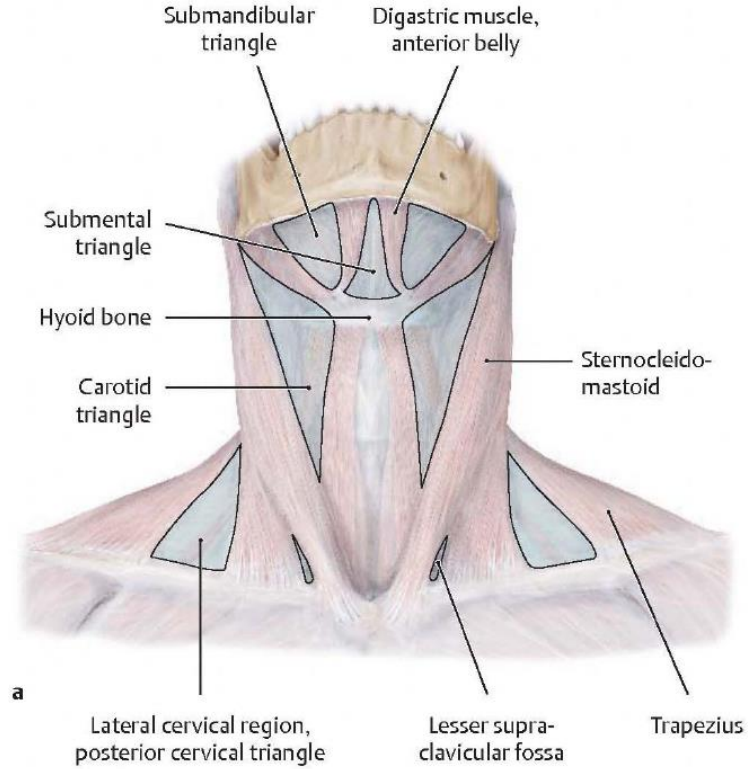
GRENZEN:

digastricus

(2x venter anterior)

Os hyoideum

BODEN:mylohyoideus



Trigonum caroticum:

GRENZEN:

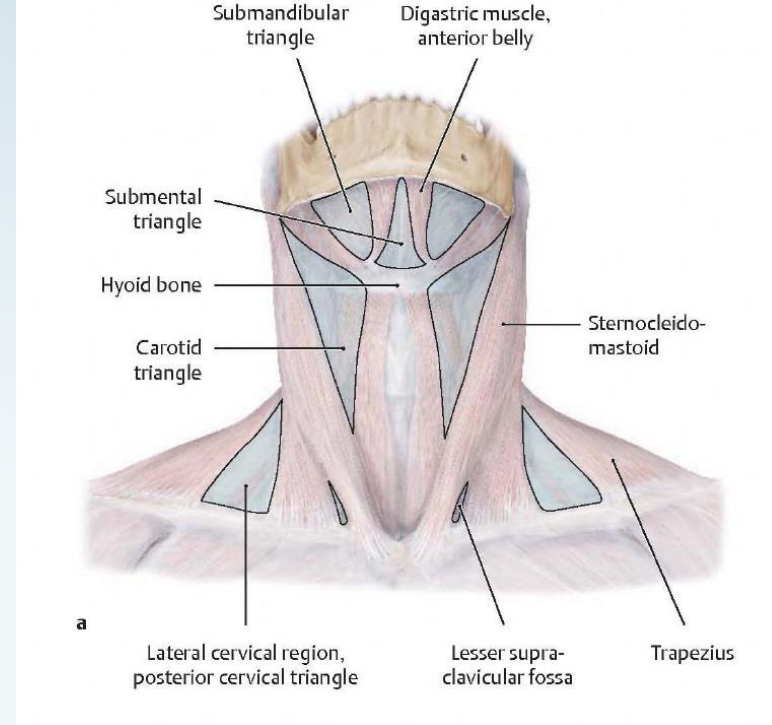
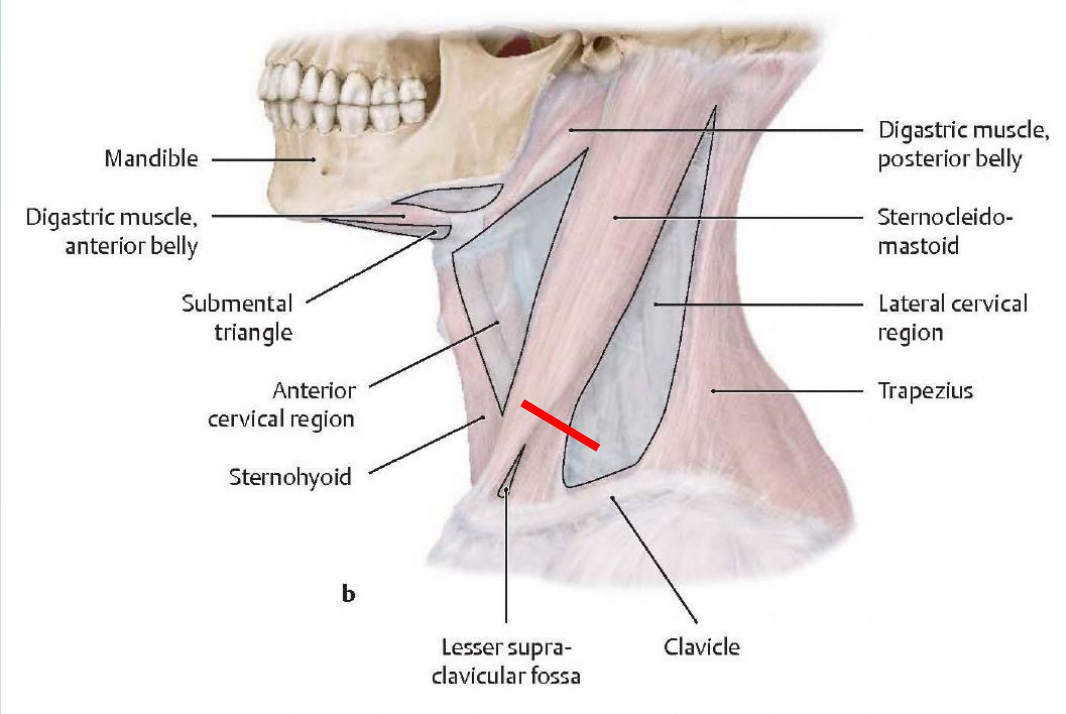
sternocleidomastoideus

omohyoideus

Digastricus, venter posterior

BODEN:

musculi scaleni



Trigonum anterius (mediale)

GRENZEN:

sternohyoideus (thyrohyoideus)

omohyoideus (venter superior)

sternocleidomastoideus

BODEN:

Eingeweide (larynx, trachea), Faszie

Trigonum cervicalis lateralis (supraclaviculare major)

GRENZEN:

sternocleidomastoideus

trapezius

clavicula

BODEN:

Tiefe Halsmuskeln

ABSCHNITTE

separiert durch den venter inf.

m. omohyoidei

trig. omotrapezoideum

trig. omoclaviculare

Trigonum supraclaviculare minor

GRENZEN:

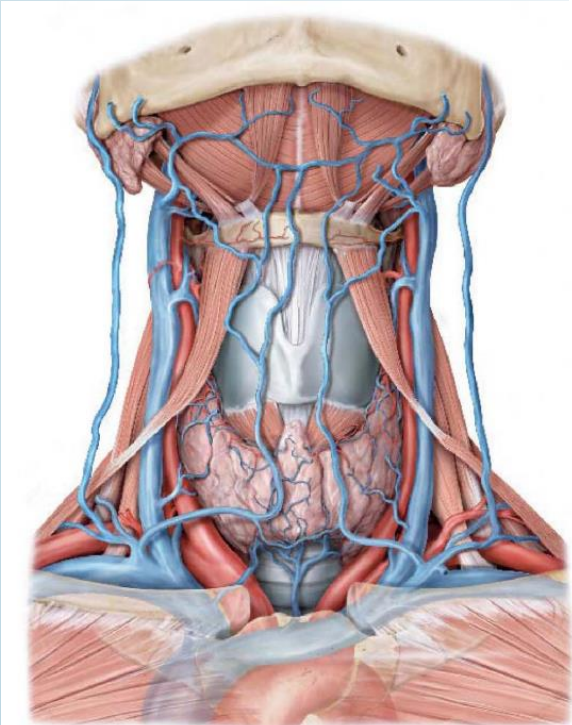
Zwischen die zwei

Ursprüngen des m.

Sternocleidomastoideus

Trigonum submentale

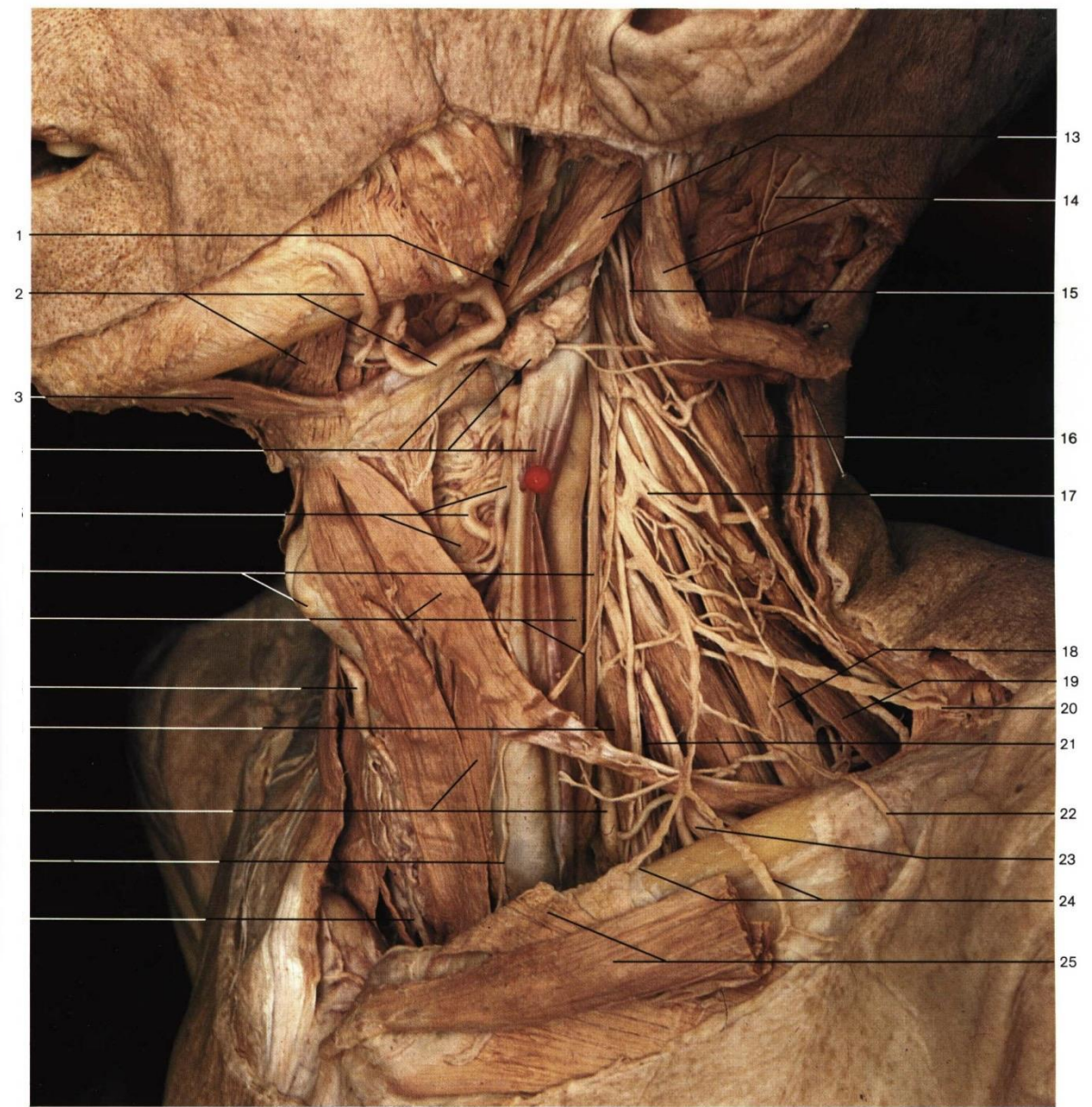
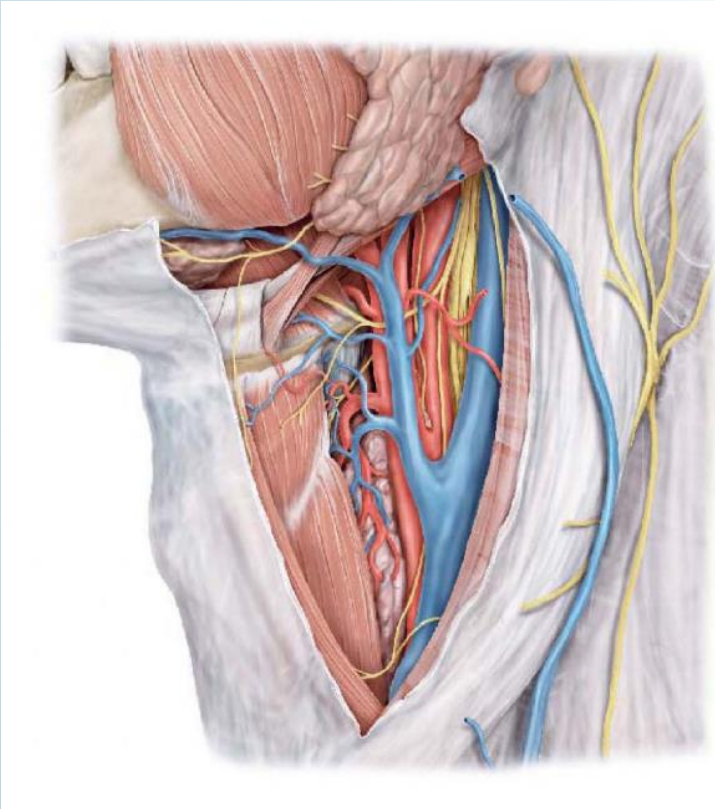
Regio cervicalis anterior



Anterior triangle (anterior aspect). The pretracheal lamina of cervical fascia and left sternocleidomastoid muscle have been removed.

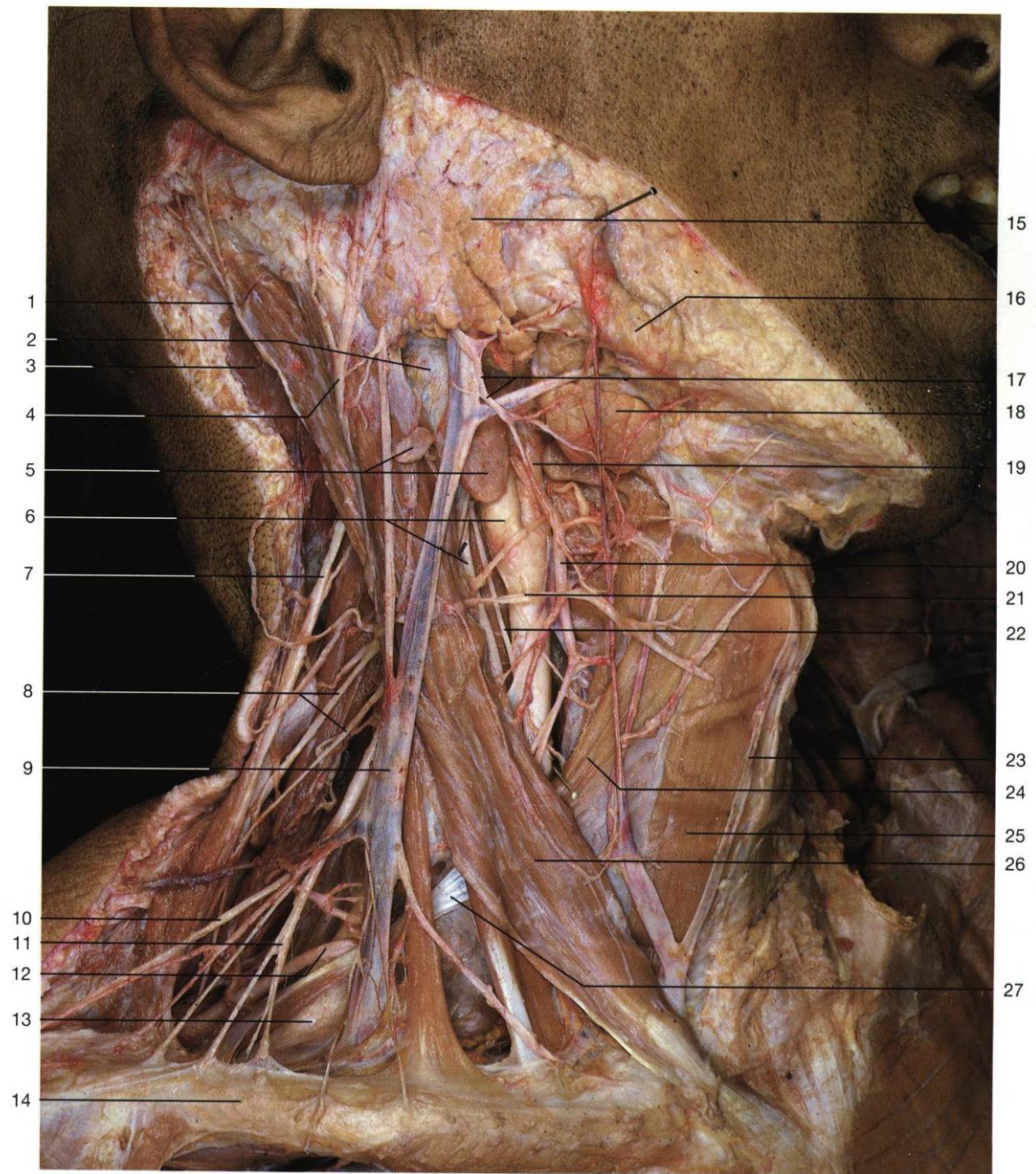
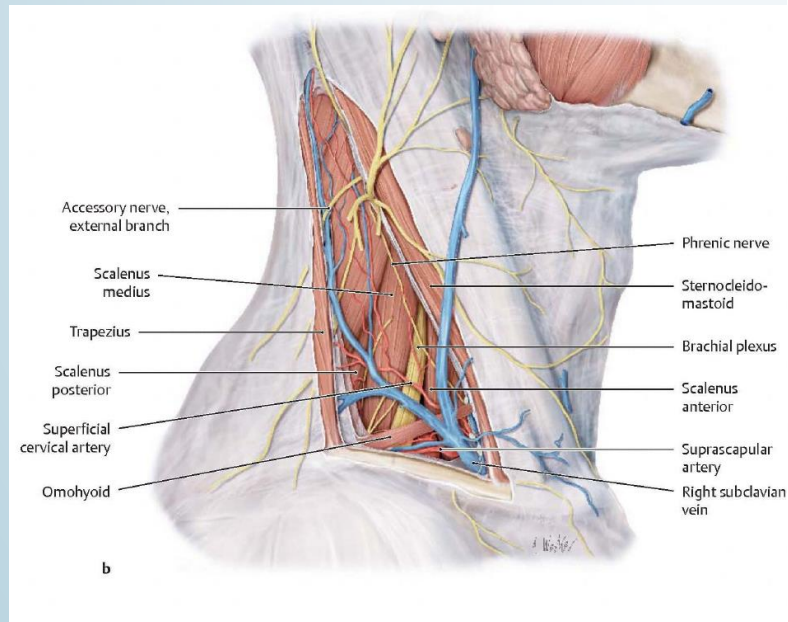
Trigonum submandibulare

Trigonum caroticum

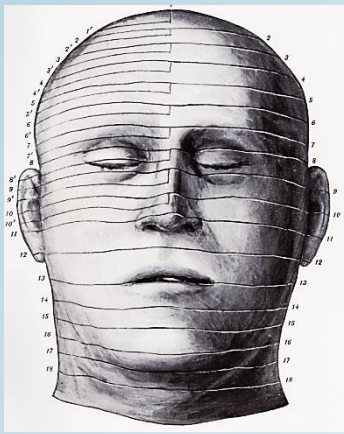


Neck, deep dissection (lateral aspect). The internal jugular vein has been reflected to expose the carotid artery and vagus nerve.

Trigonum cervicalis lateralis:
 -trigonum omotrapezoideum
 -trigonum supraclaviculare



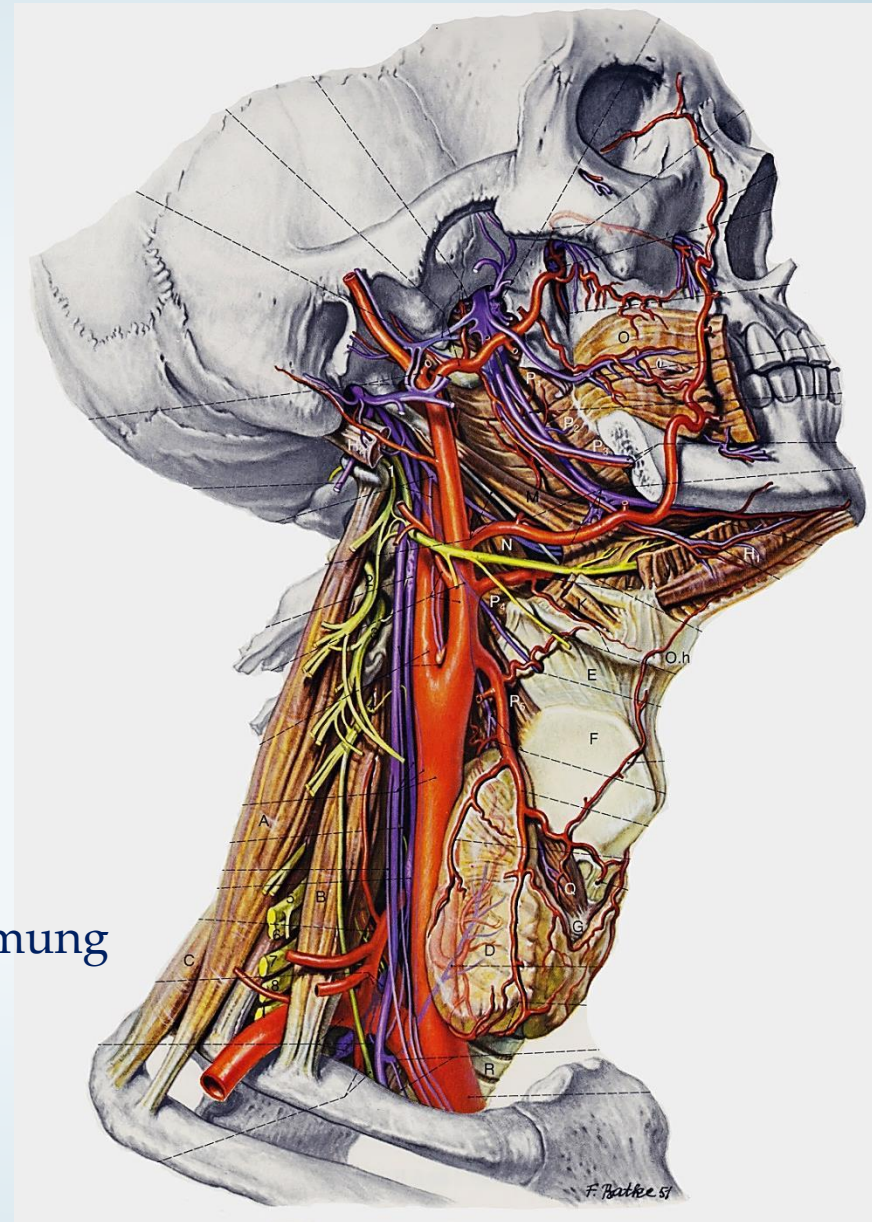
Posterior and carotid triangles (lateral aspect). Superficial dissection. The superficial lamina of cervical fascia has been removed to display the cutaneous branches of the cervical plexus and subcutaneous veins.



C4 Oberrand des Schildknorpels
Teilung der A. carotis comm.

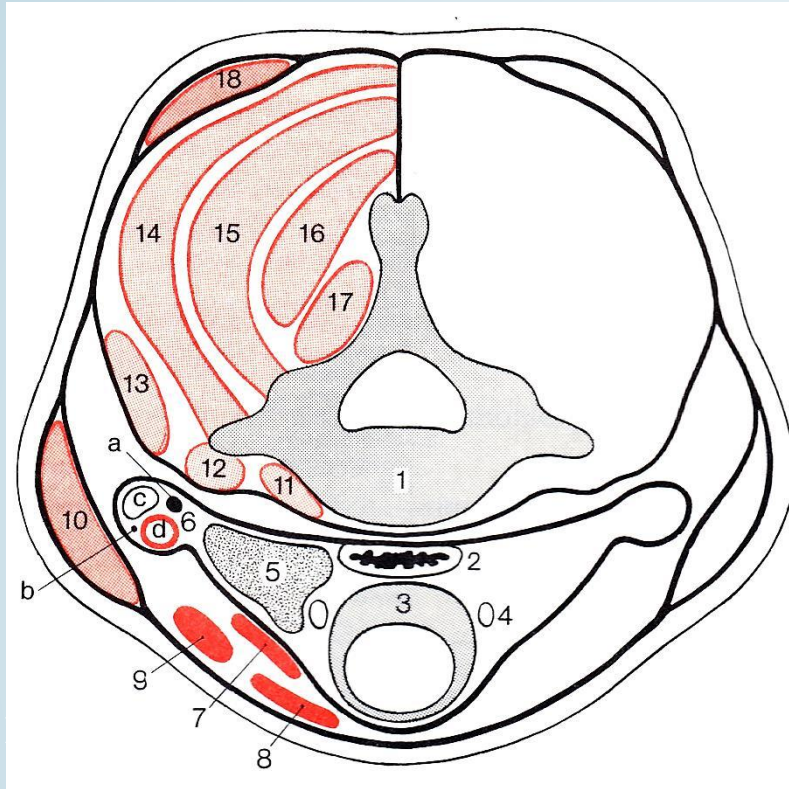
C6 Ringknorpel
Pharynx – Oesophagus Übergang
(Spatium retropharyngeale →
Spatium retrooesophageale)

Höhenbestimmung in axialen Schnitten
erfolgt in der Praxis oftmals durch Bestimmung
der Wirbelhöhe (bzw. Bandscheibe).



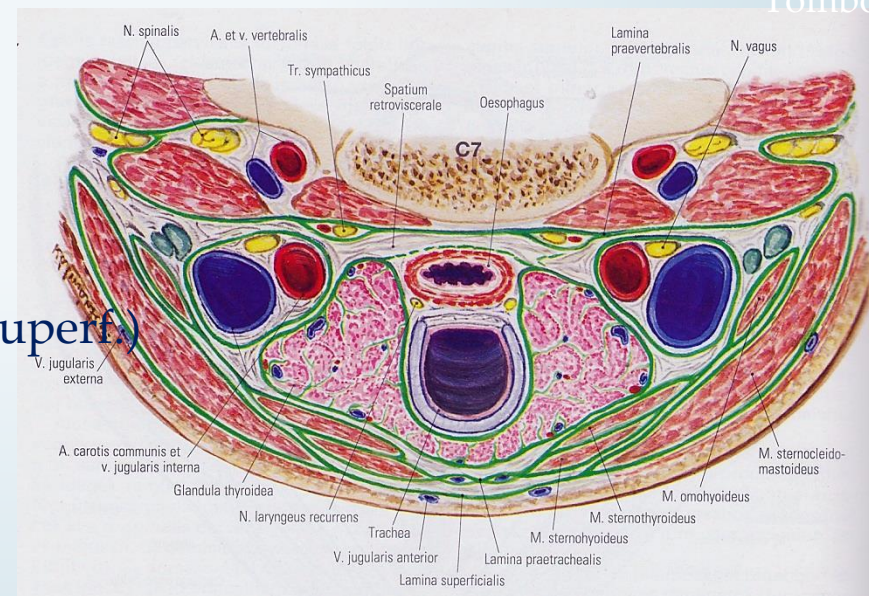
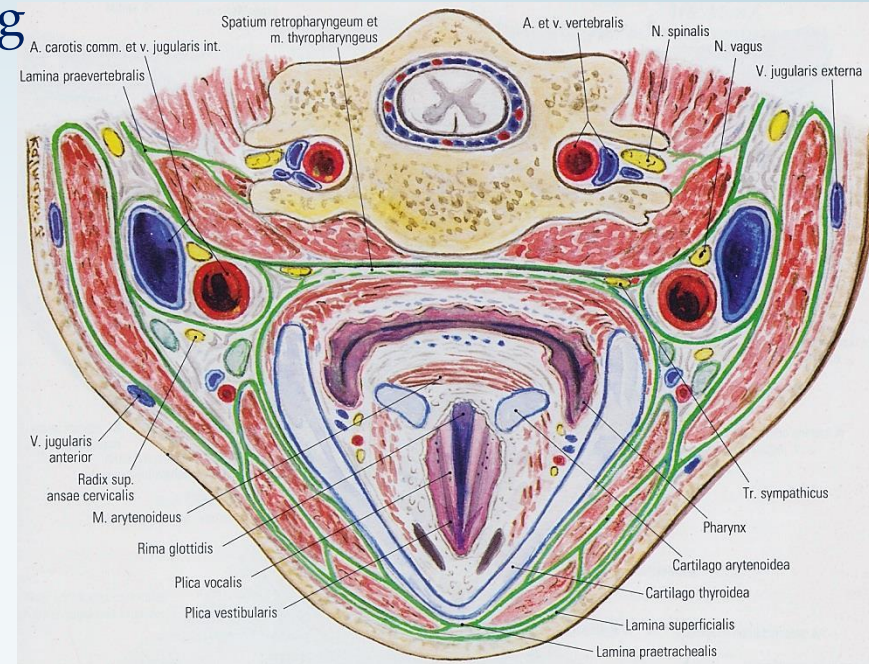
Pernkopf

Halsfaszien – „klassische“ Einteilung

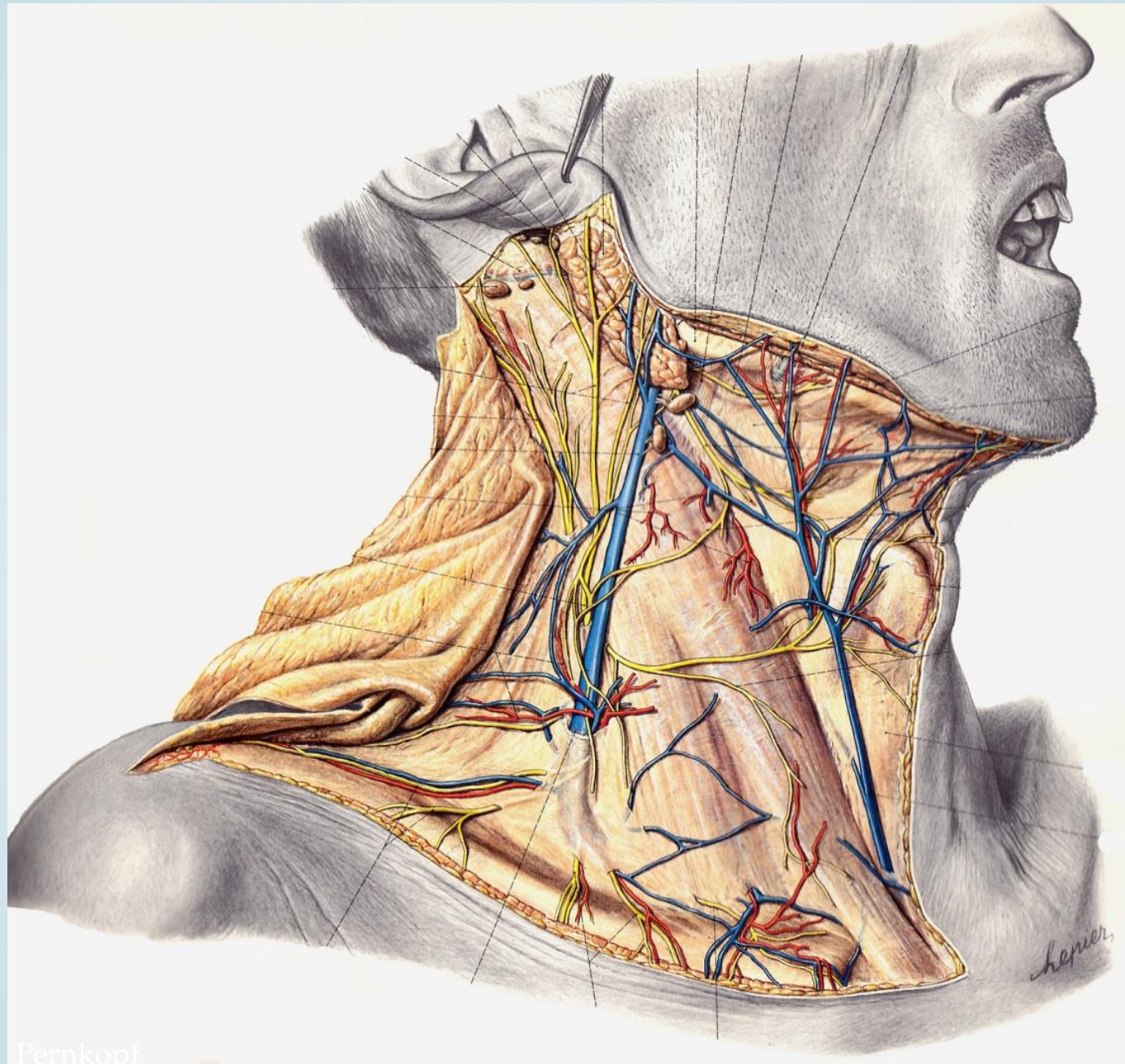


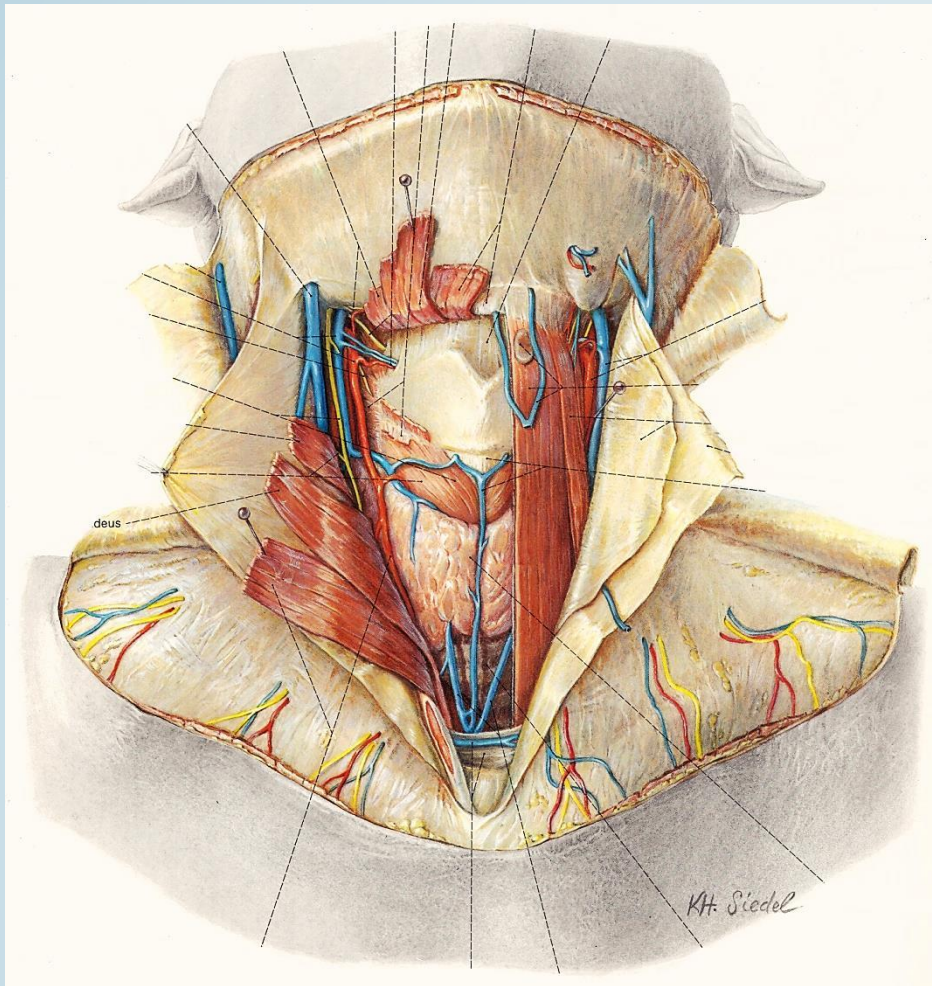
1. Lamina superficialis (hinten F. nuchalis superf.)
2. Lamina praetrachealis (visceralis)
3. Lamina praevertebralis

= Fascia cervicalis

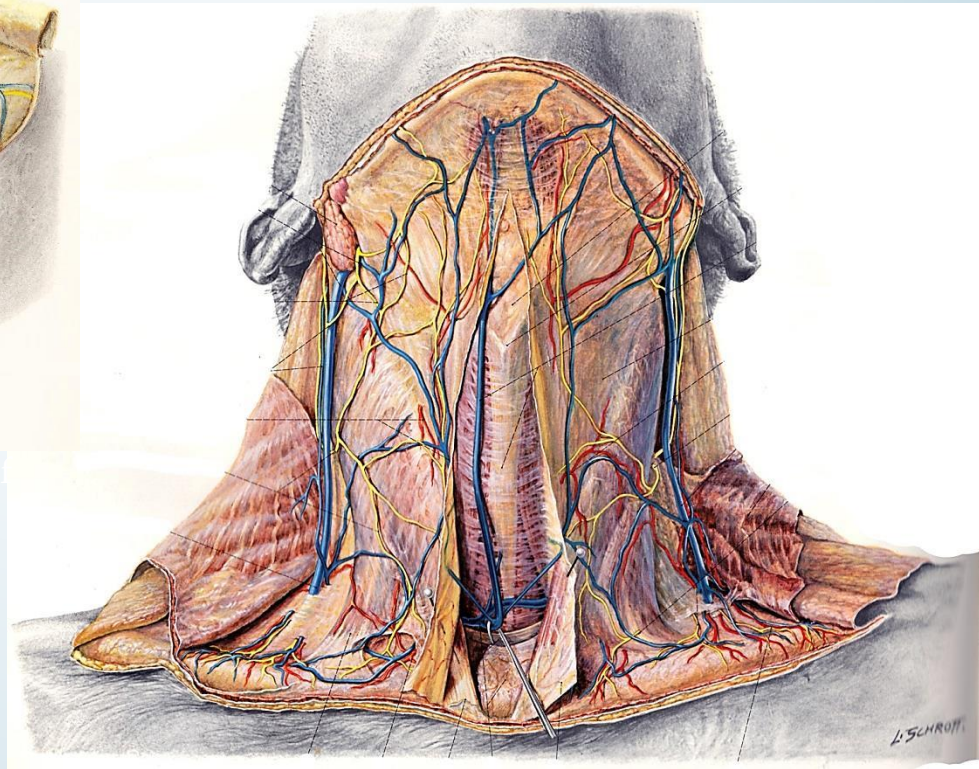


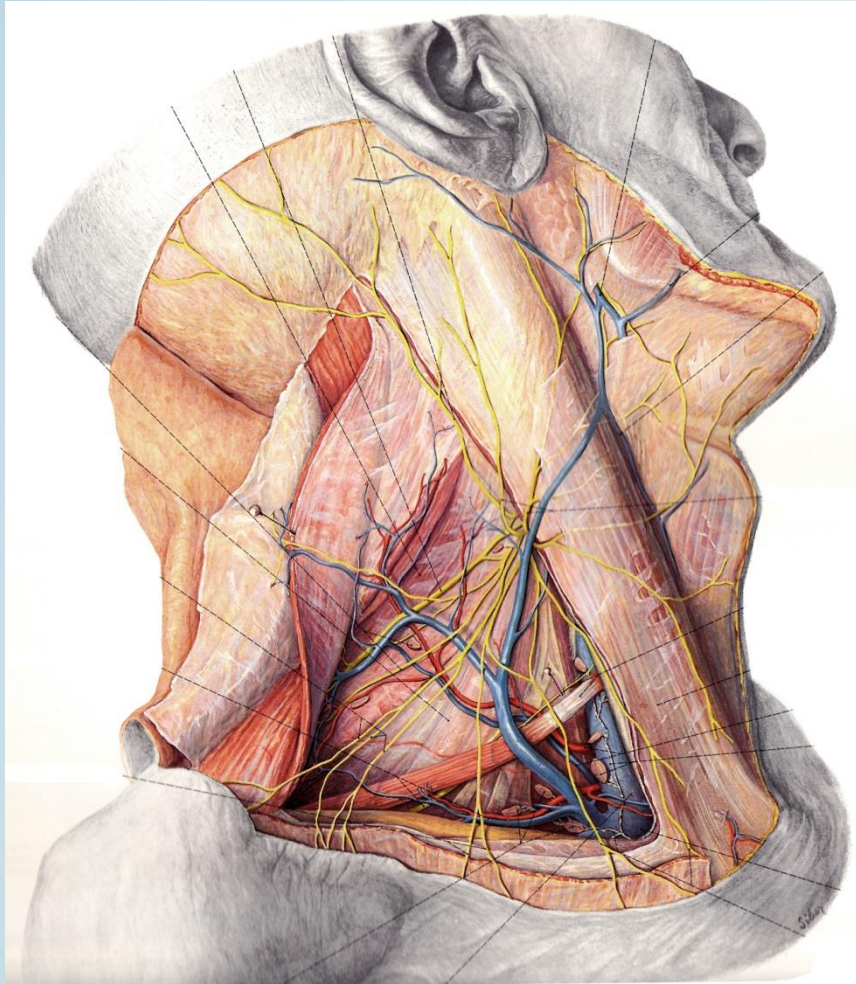
Tömböl



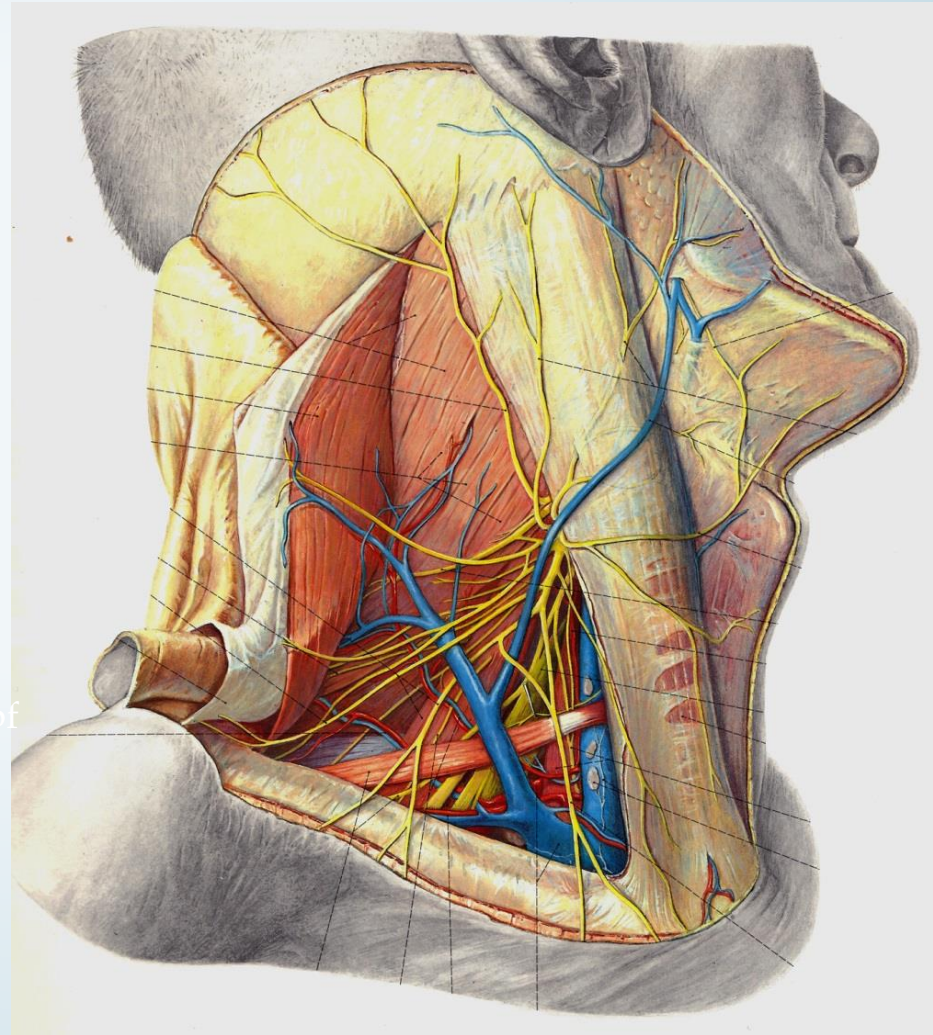


Pernkop





Pernkopf



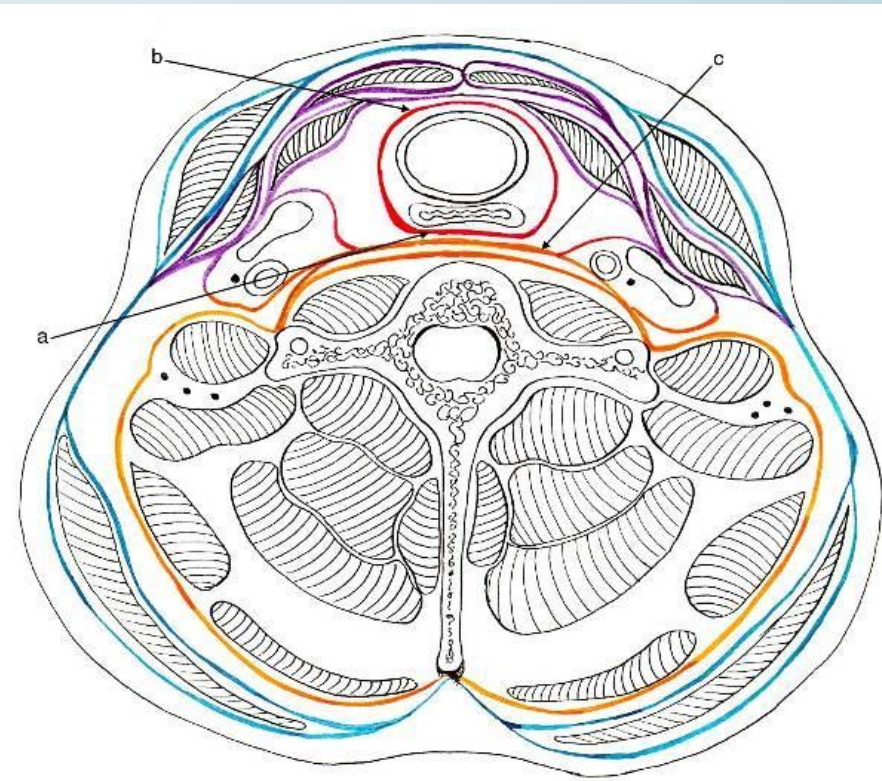
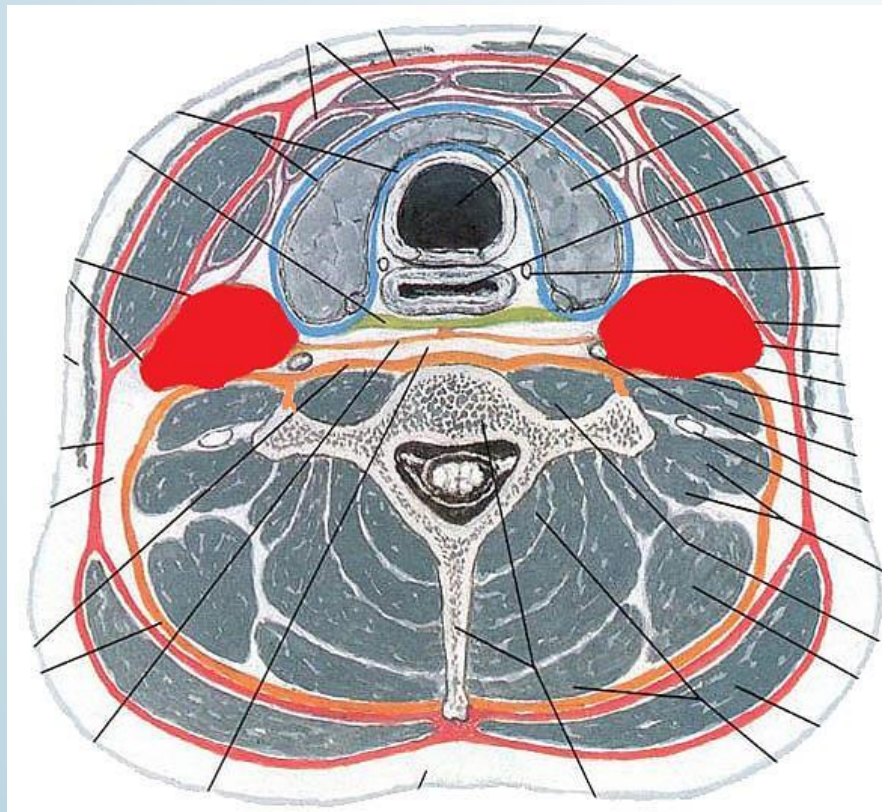
Lamina superficialis

Lamina visceralis

Lamina visceralis

Lamina visceralis

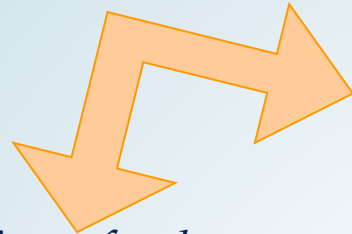
Lamina praevertebralis



Deep Layers of Cervical Fascia

- Investing Layer
- Middle Layer
- Visceral Layer
- a- Retrovisceral (esophageal) fascia
- b- Pretracheal fascia
- Vertebral Layer
- c- Alar fascia
- Carotid Sheath

HALSFASZIEN



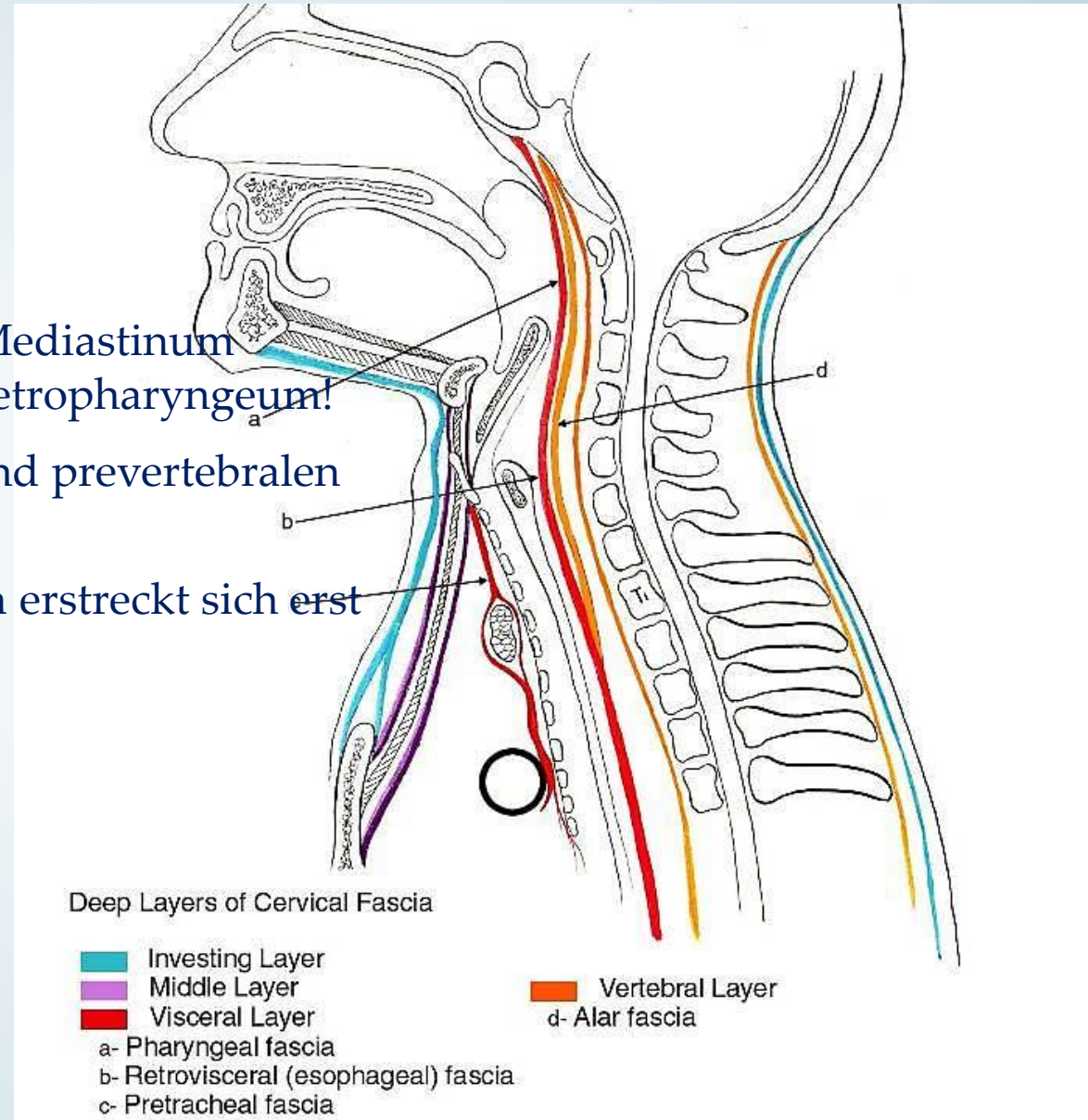
● Fascia cerv. spf. /Platysma/

- *Fascia cervicalis profunda*
 - Lamina *superficialis* /USA: investing fascial/
 - Lamina *visceralis* /pretrachealis/
 - 3 Schichten – hyoidale Muskulatur
 - um die Eingeweiden: Schilddrüse, Pharynx, Trachea
 - Lamina *prevertebralis*
 - Fascia alaris!
 - axillare Scheide
 - *Vagina carotica*

„Danger-Space“ ↔ Spatium retropharyngeum

„Danger-Space“:

- Beschreiber: Grodzinsky 1938.
- eigentlich führt sie selbst ins Mediastinum posterius, nicht das Spatium retropharyngeum!
- befindet sich zw. den alaren und prevertebralen Faszienblättern
- das Spatium retropharyngeum erstreckt sich erst bis Höhe Th1 – Th2



Wesentlicher Unterschied:

Die Unterhautfascia wird Fascia cervicalis superficialis genannt

Die Fascia cervicalis profunda entspricht den 3 „klassischen“ Blättern

wobei:

das mittlere Fasciablatt (Fascia visceralis) wird noch weiter unterteilt:

Fasciablatt der infrahyoidalen Muskeln

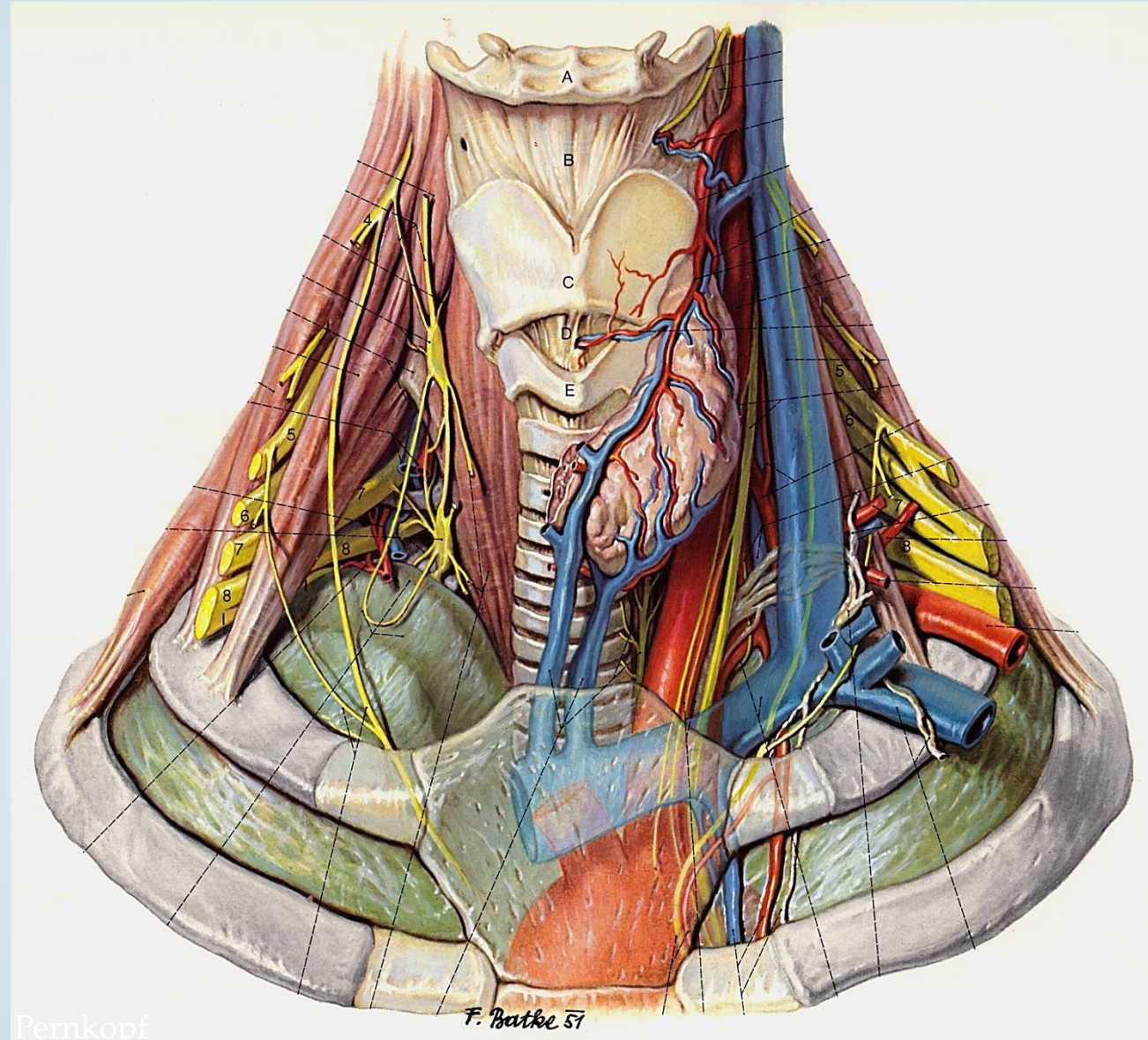
Praetracheales Blatt

Retropharyngeales Blatt

das tiefe (originell praevertebrale) Blatt auch:

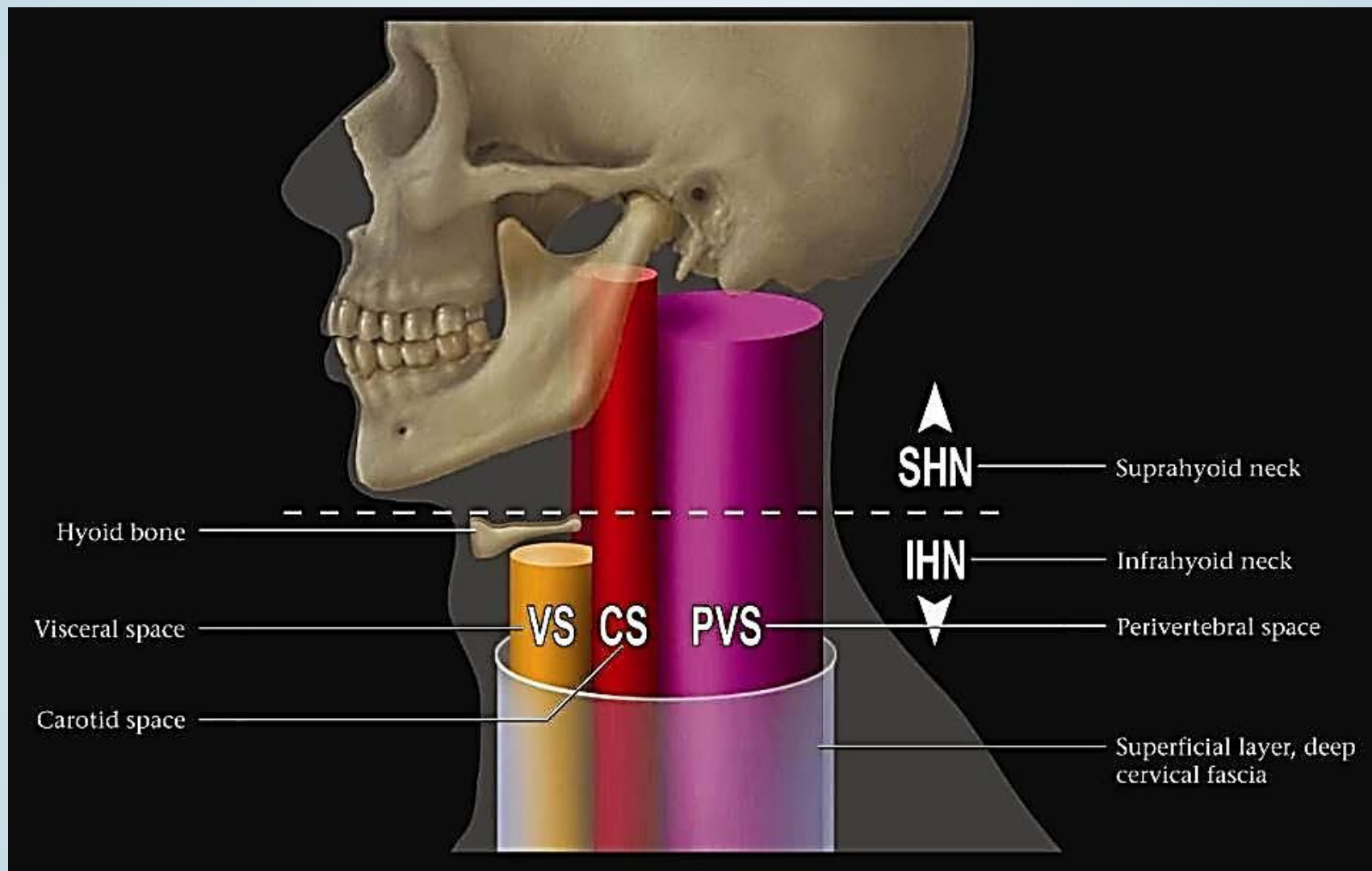
Lamina alaris / Fascia alaris

Fascia praevertebralis



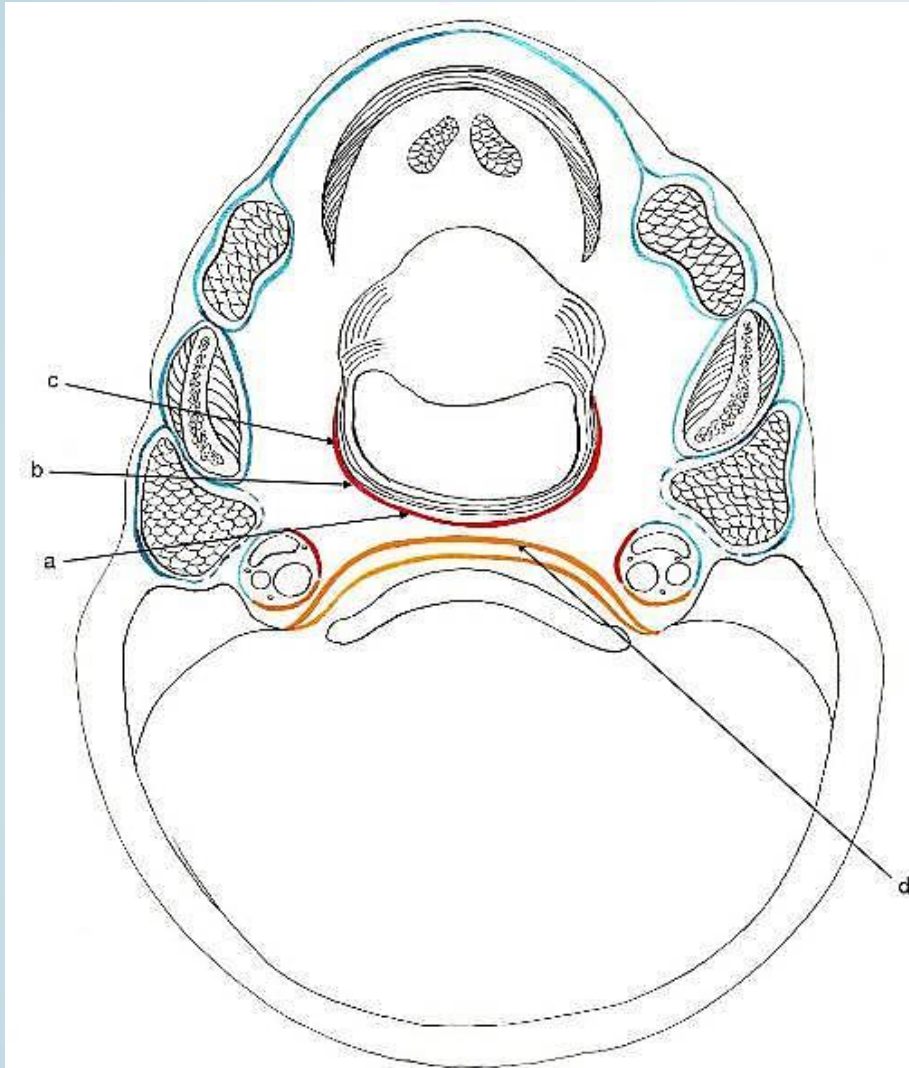
Pernkopf

F. Batke 51





aus der Vorlesung vom Herrn Dr. Péter Magyar

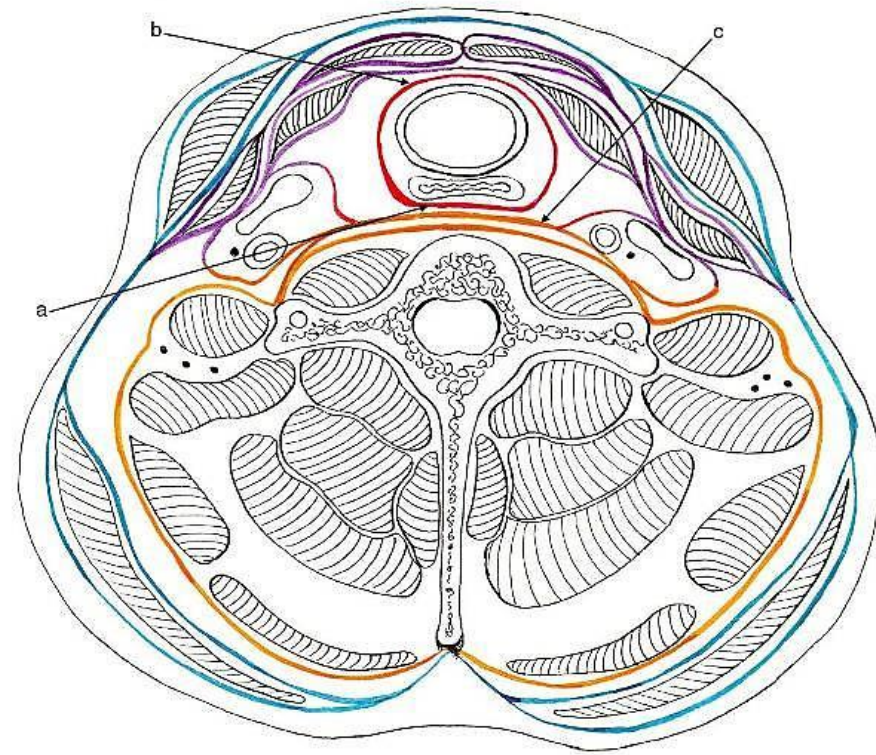
Über dem Zungenbein








Deep Layers of Cervical Fascia

- | | |
|--|---|
|  Investing Layer |  Vertebral Layer |
|  Pharyngeal Layer | d- Alar fascia |
| a- Retropharyngeal | |
| b- Lateral pharyngeal | |
| c- Buccopharyngeal | |

Unter dem Zungenbein



Deep Layers of Cervical Fascia

- | | |
|---|---|
|  Investing Layer |  Vertebral Layer |
|  Middle Layer | c- Alar fascia |
|  Visceral Layer |  Carotid Sheath |
| a- Retrovisceral (esophageal) fascia | |
| b- Pretracheal fascia | |

SH

- pharyngealer mucosaler Raum
- Masticatorraum
- parapharyngealraum
 - prestyloid /
 - poststyloid
- Sublingualraum
- Submandibularraum
- buccaler Raum
- Parotisraum

IH

- anterior zervikaler Raum
- anterior viszeraler Raum
- posterior zervikaler R.

Ganze Länge

- Retropharyngealraum
- Danger-Space
- Vagina carotica
- Perivertebralraum
 - prevert./ paraspin.

Regio parotideomasseterica

Fossa retromandibularis

Fossa infratemporalis

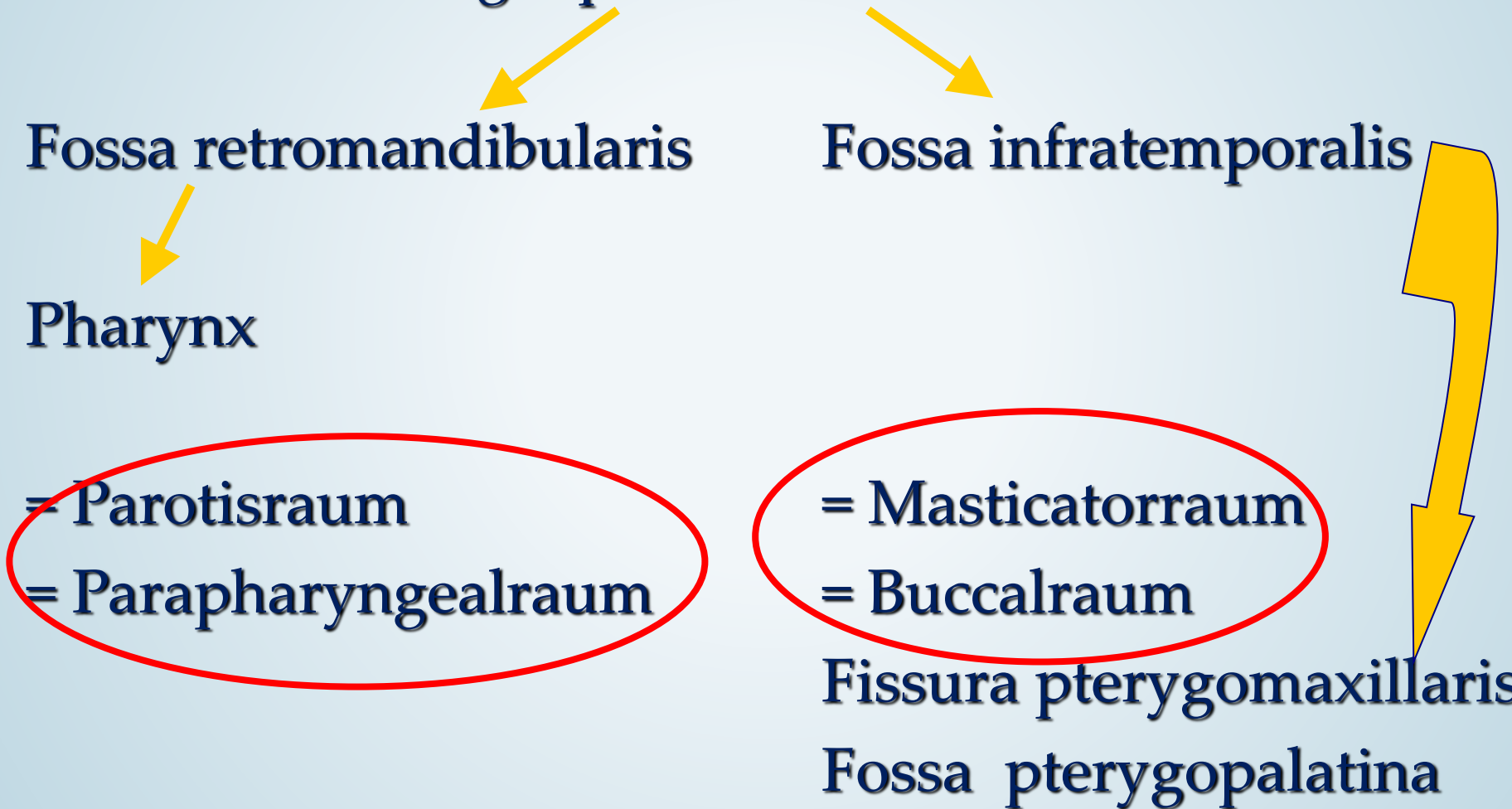
Pharynx

= Parotisraum
= Parapharyngealraum

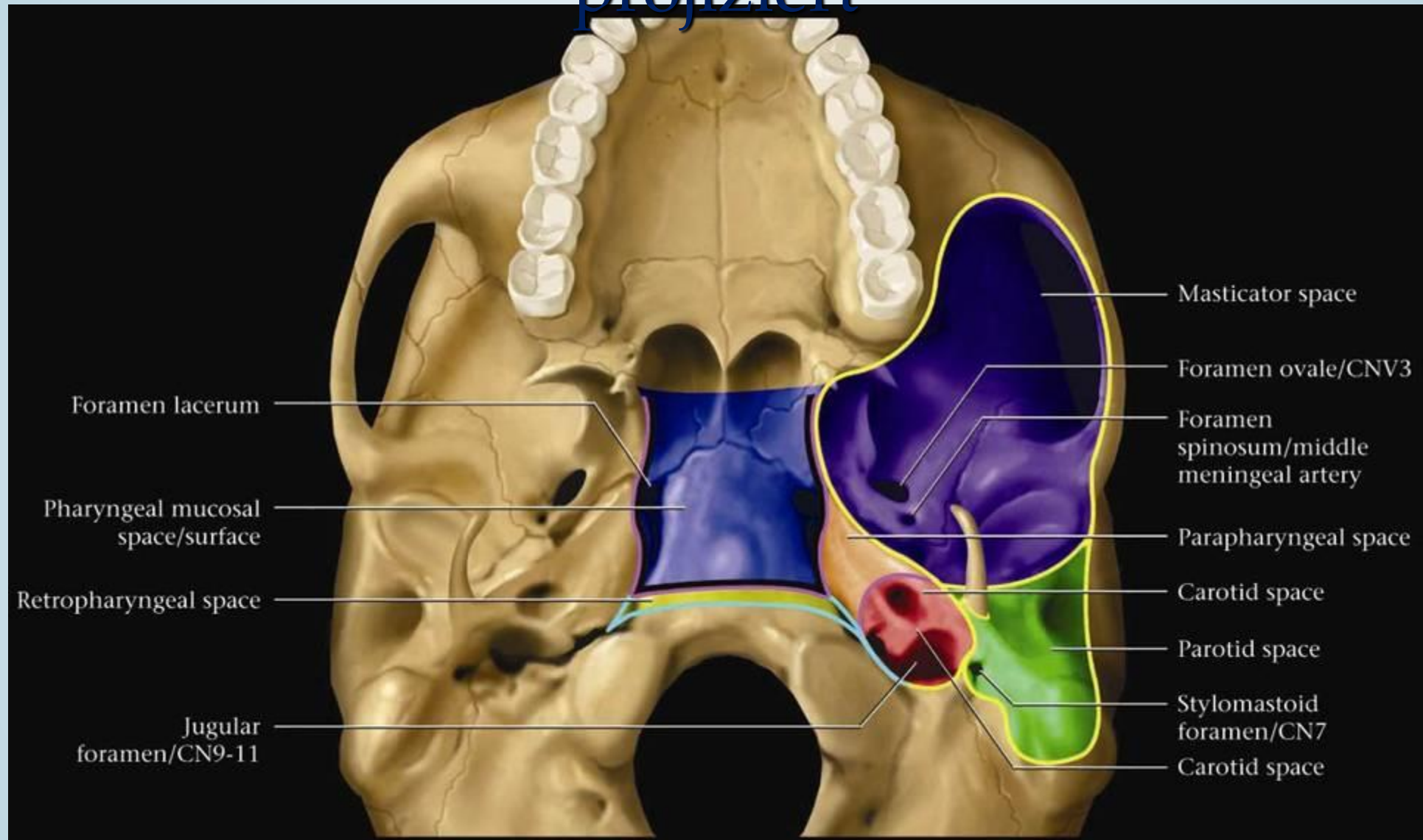
= Masticatorraum
= Buccalraum

Fissura pterygomaxillaris

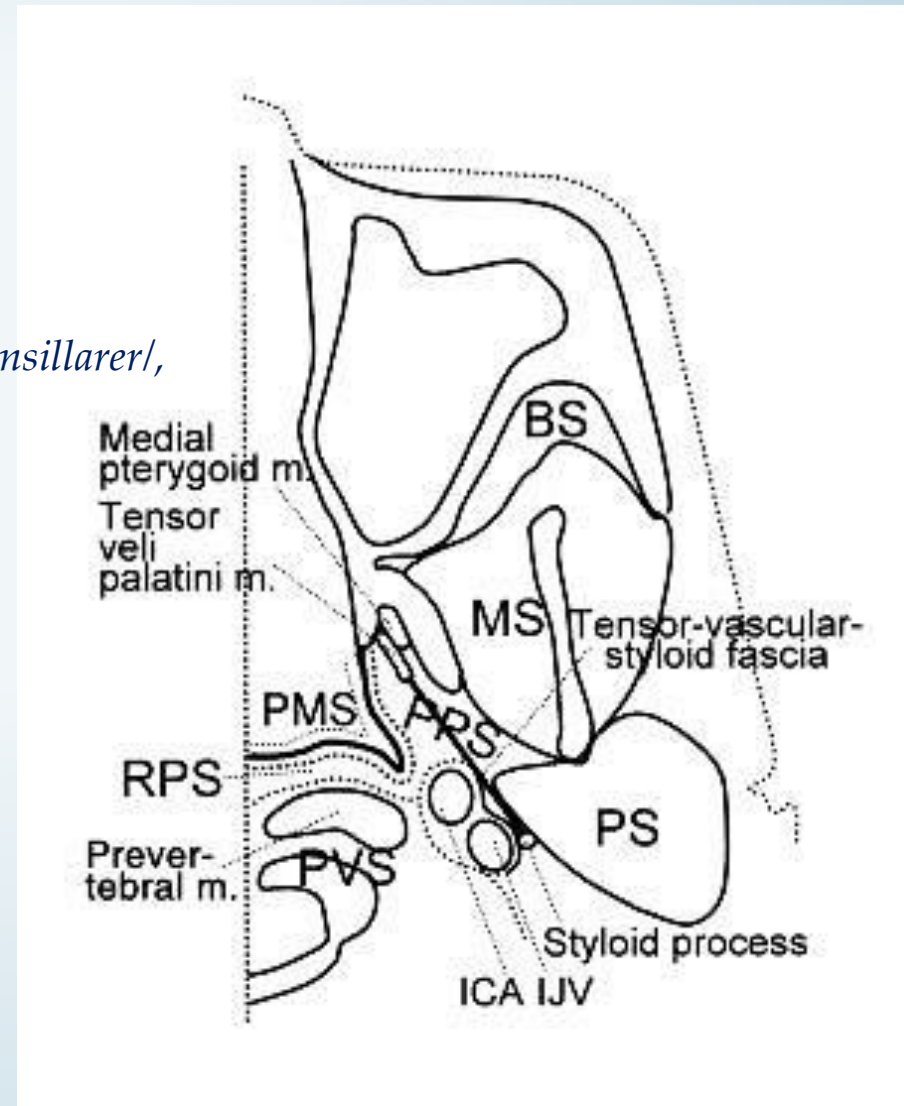
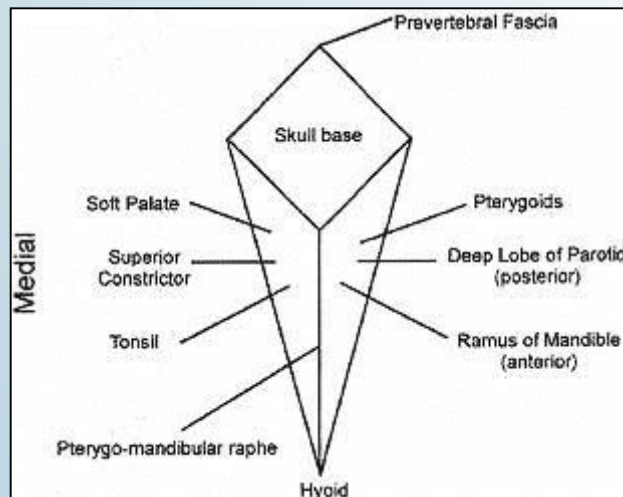
Fossa pterygopalatina



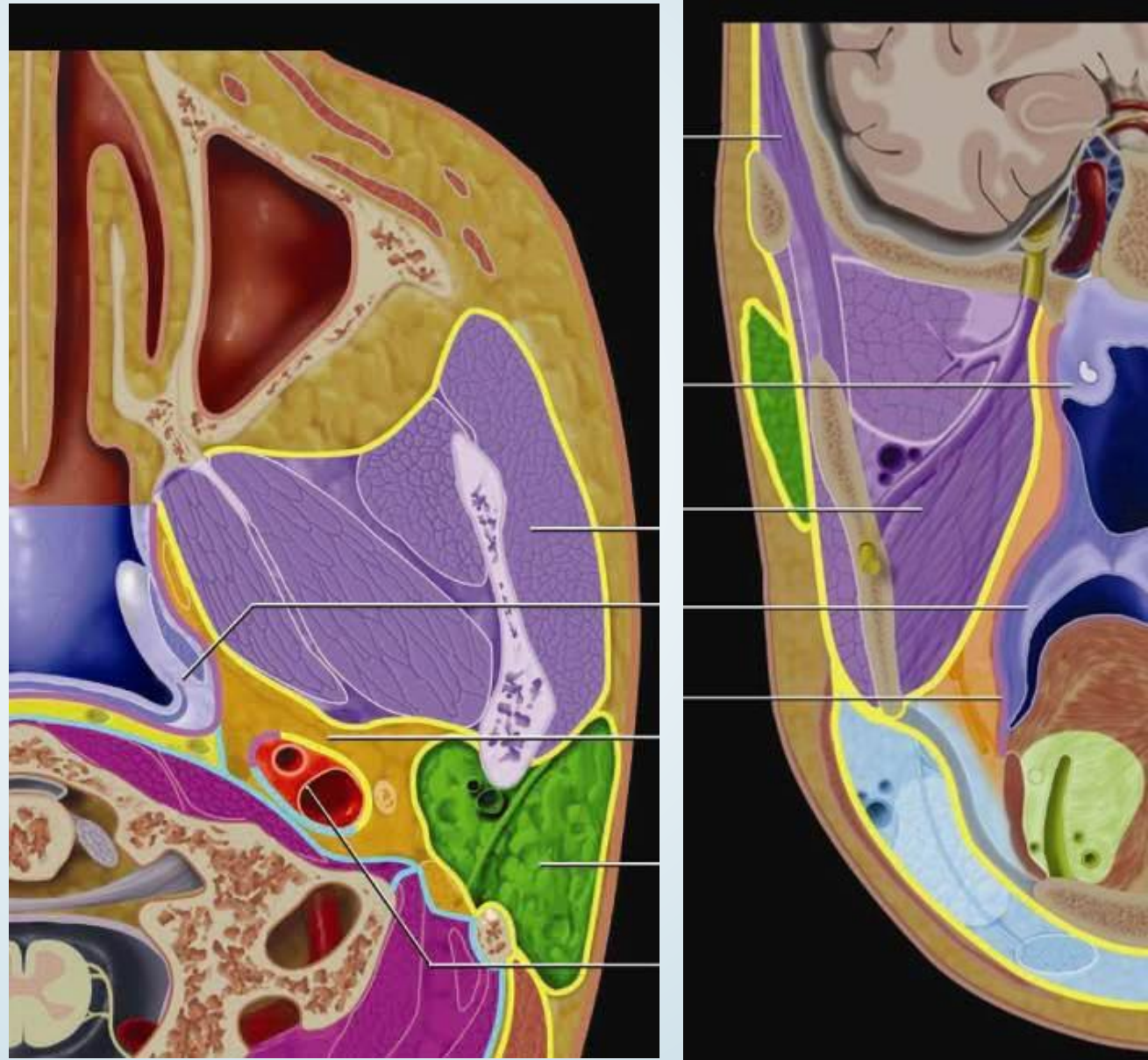
Kopf-Hals Raume an die Schadelbasis projiziert



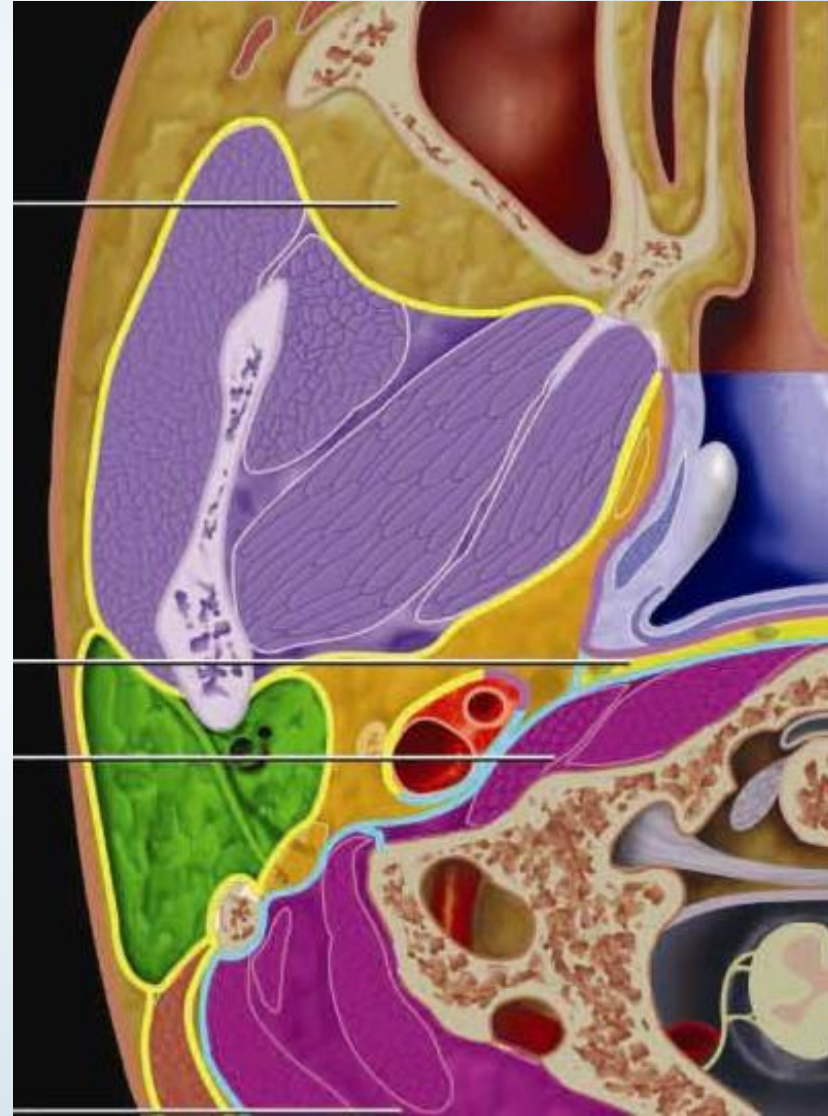
- Fettgewebe
- Gefäße
- Kompaß vom Suprahyoidalraum
- Faszie des M. tensor veli palatini
- prestyloid
- poststyloid
- Grenzen: Masticator-, pharyngealer mucosaler /peritonsillarer/, Parotis-, Submandibularraum



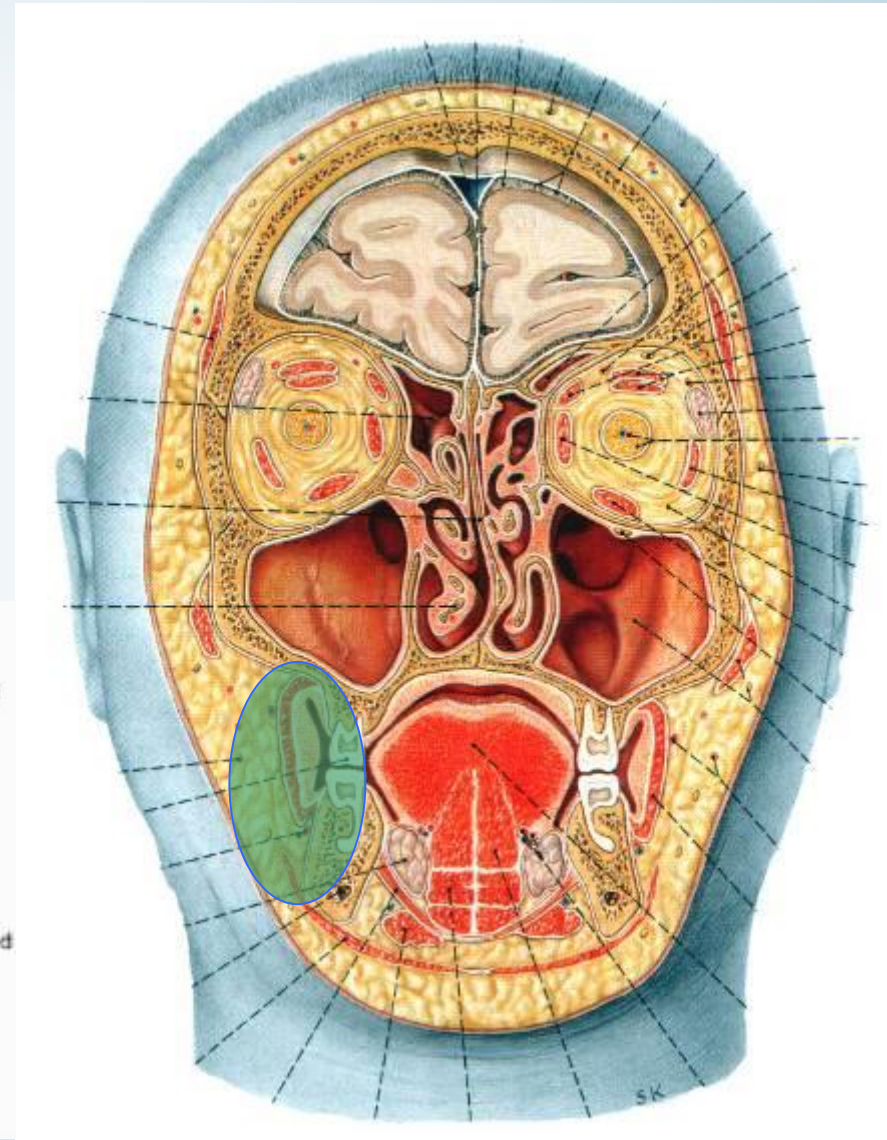
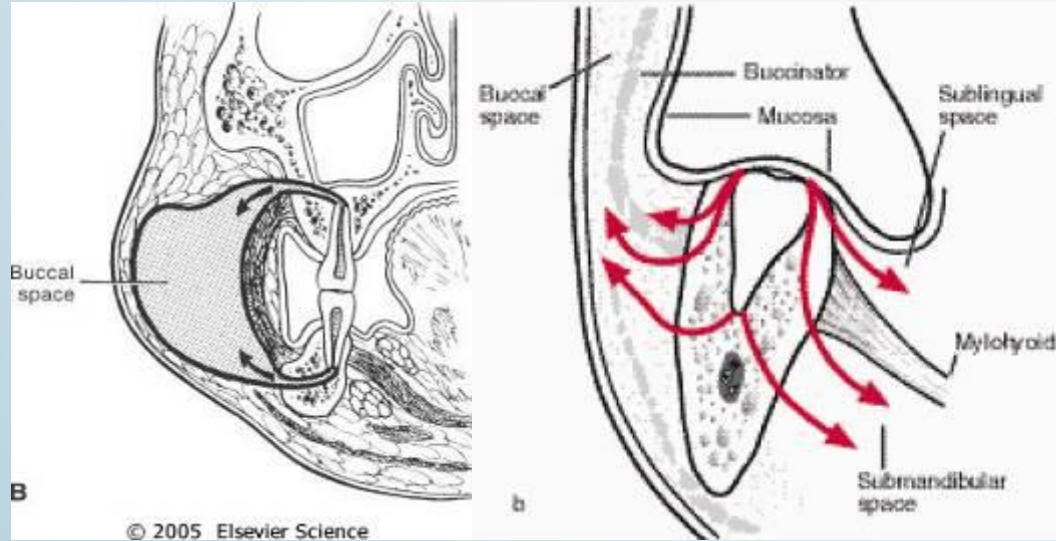
- *Kaumuskulatur*
 - *PM, PL, M, T*
- *Gefäße*
- *Äste des N. V/3*



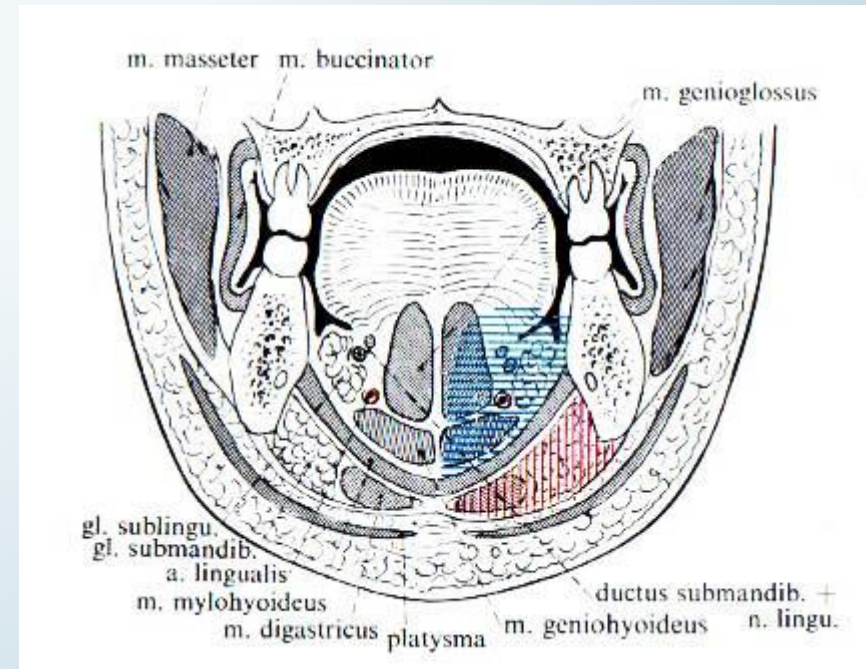
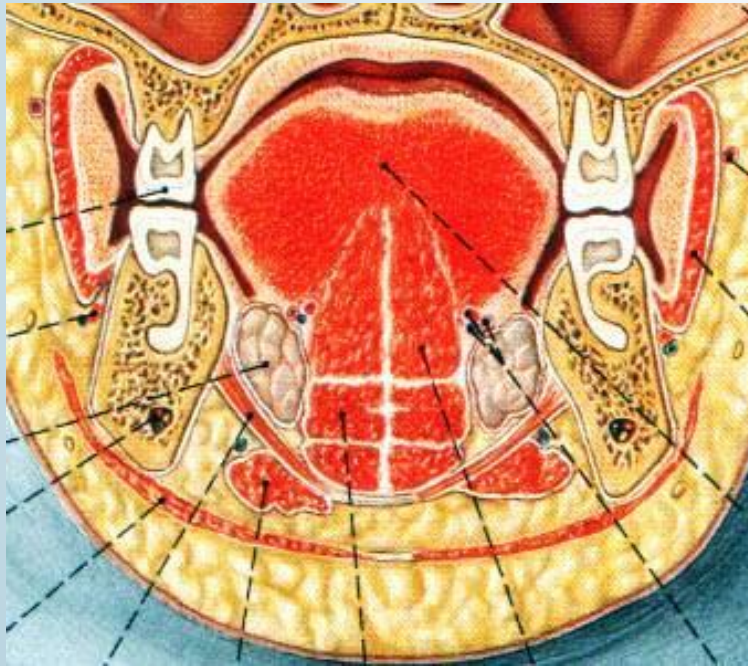
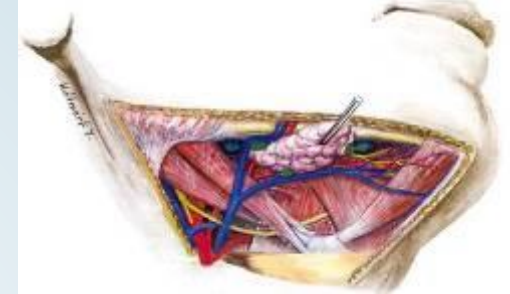
- *Gl. parotidea*
- *Teilung vom N. VII.*
- *N. auriculotemporalis*
- *Gefäße: ACE, VRM*

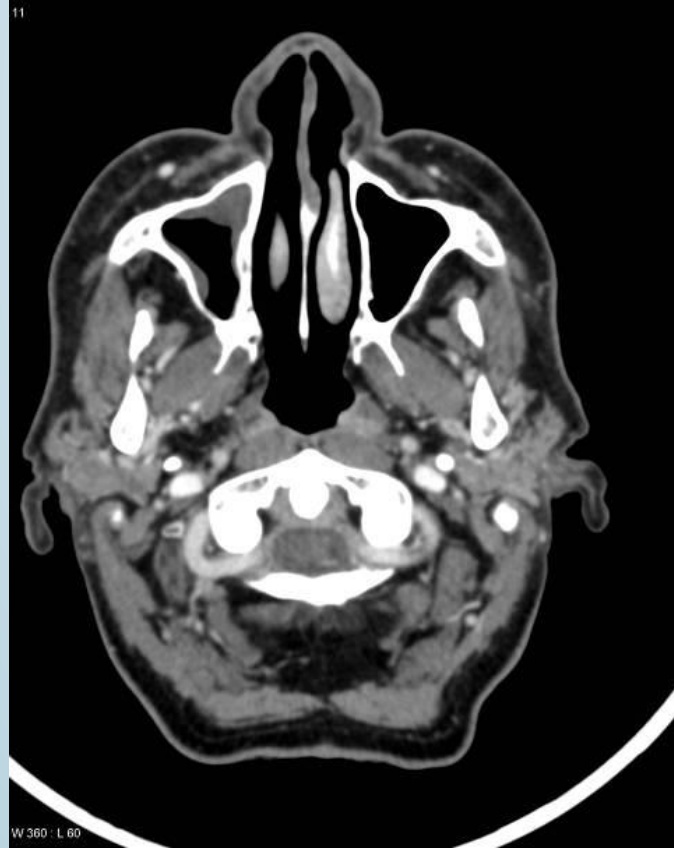
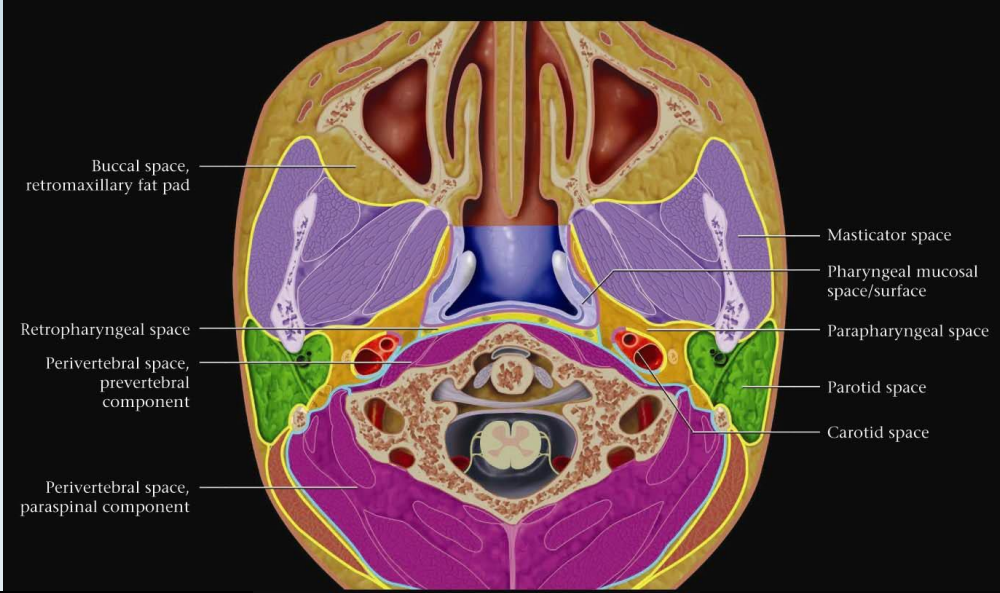


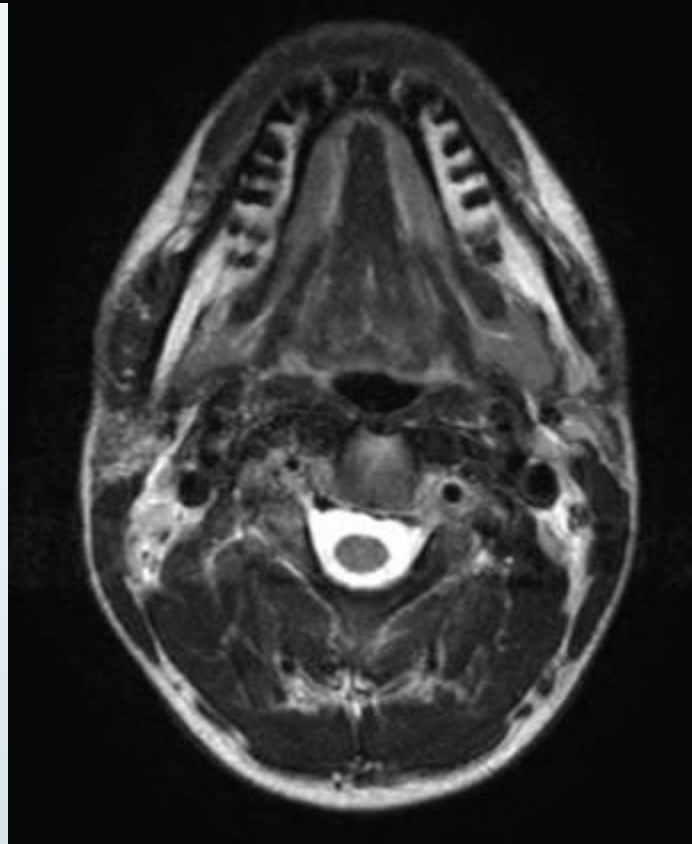
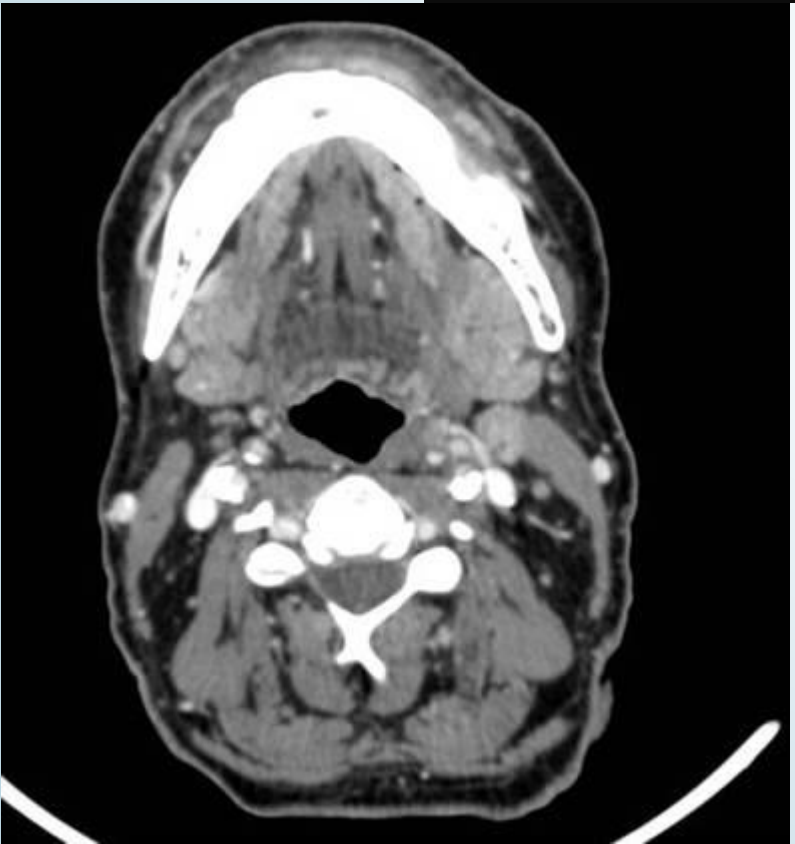
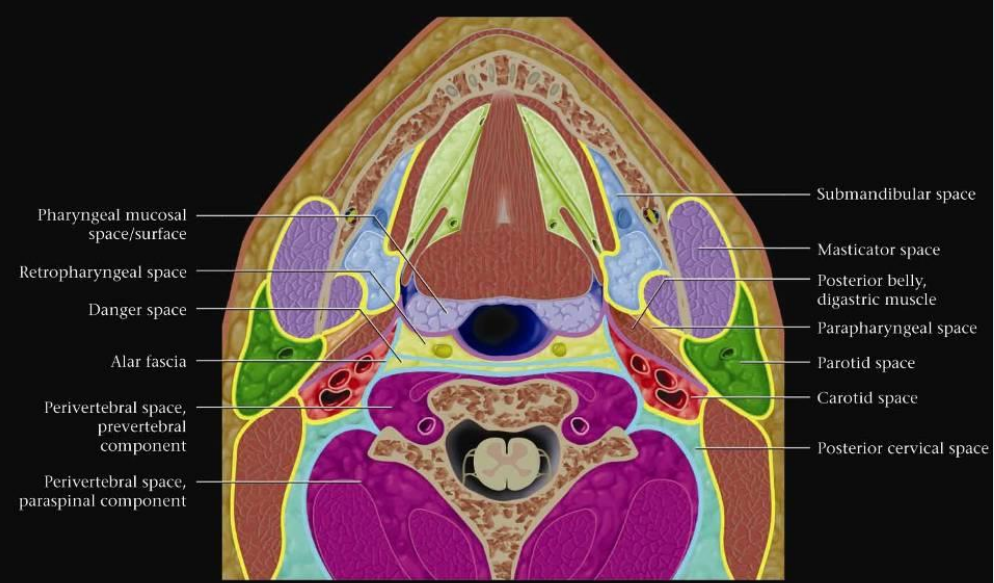
- *M. buccinator*
- *Stenonscher gang /Parotis/*

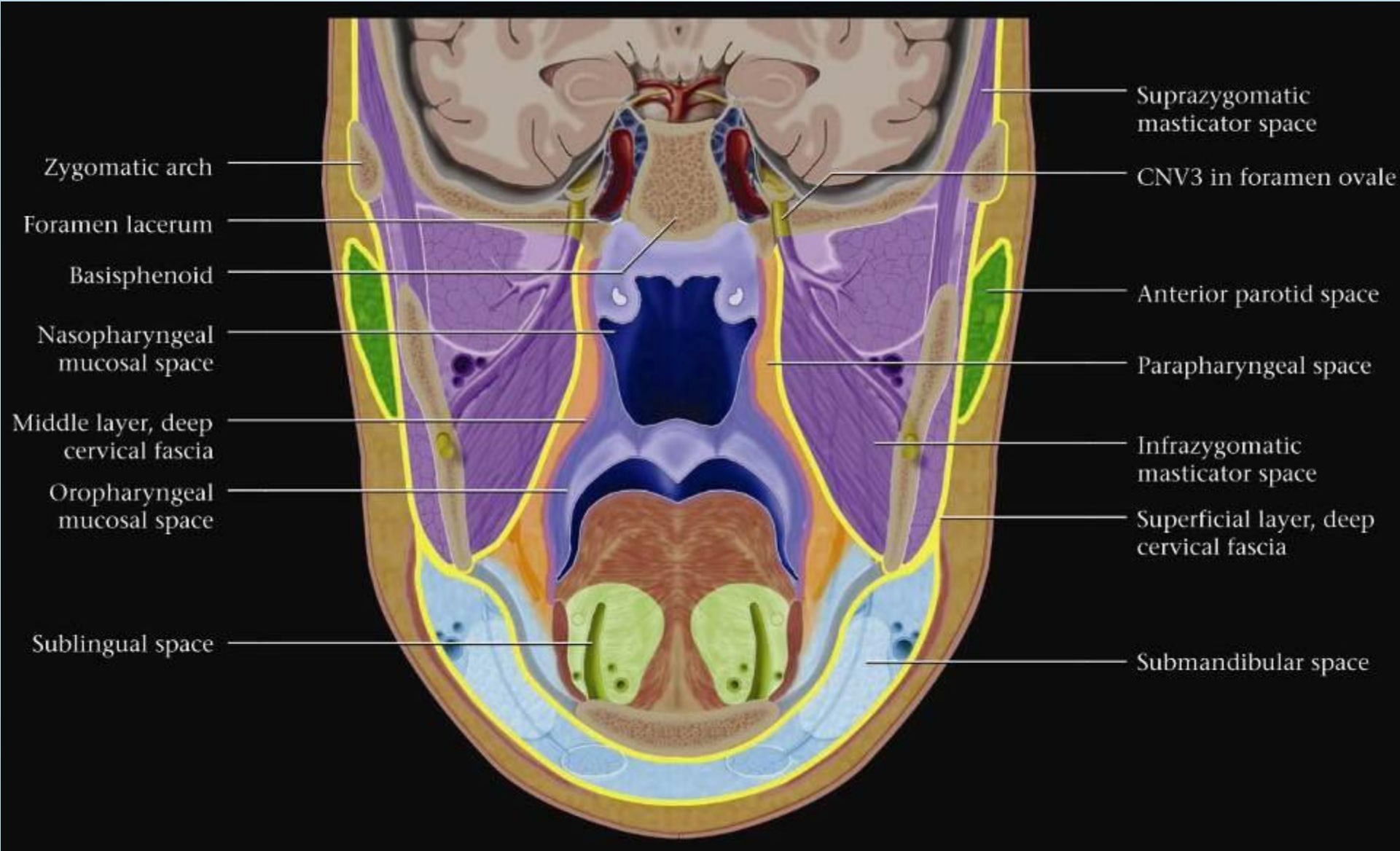


- *M. mylohyoideus* /Hinterrand/
- SML: *A. lingualis*
- SLL: *N. lingualis*, Whartonscher Gang, *Gl. sublingualis*
- SM: *Gl. submandibularis*









Zygomatic arch

Foramen lacerum

Basisphenoid

Nasopharyngeal mucosal space

Middle layer, deep cervical fascia

Oropharyngeal mucosal space

Sublingual space

Suprazygomatic masticator space

CNV3 in foramen ovale

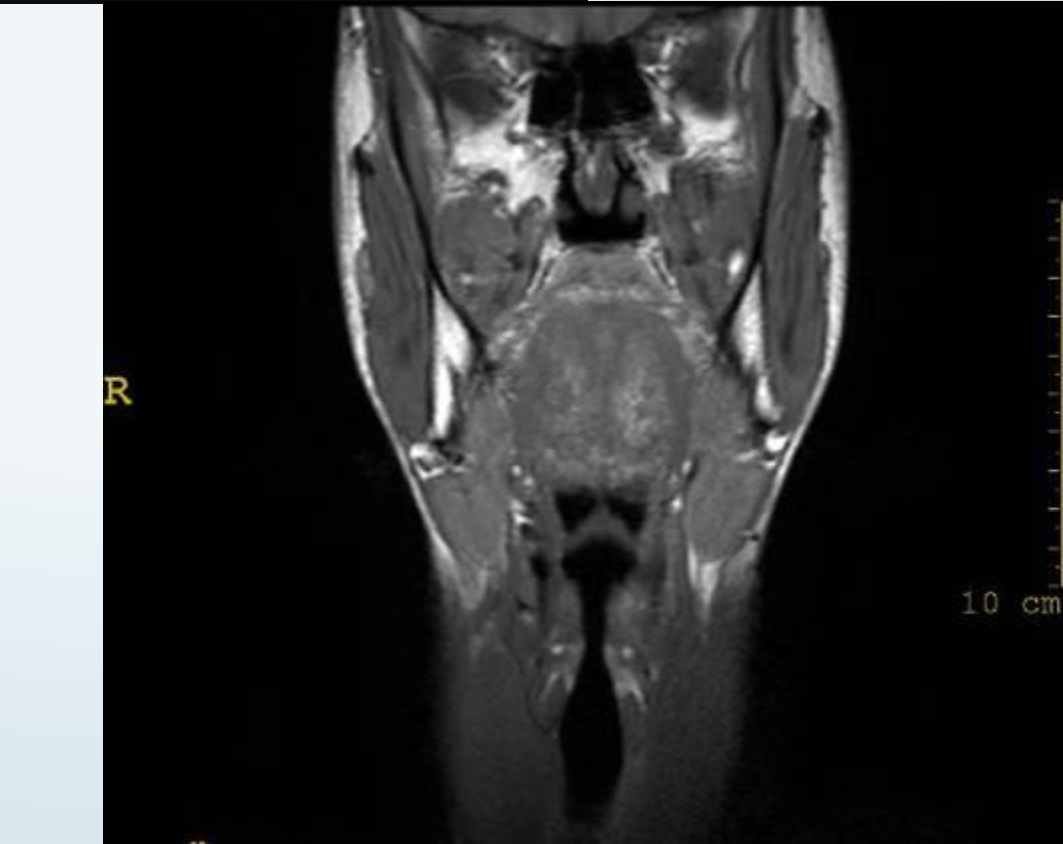
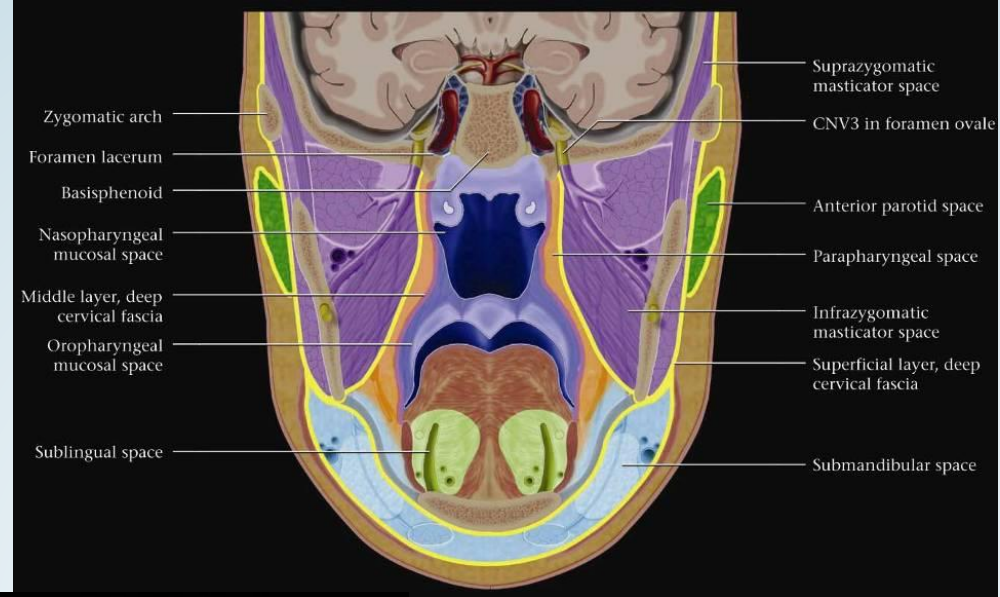
Anterior parotid space

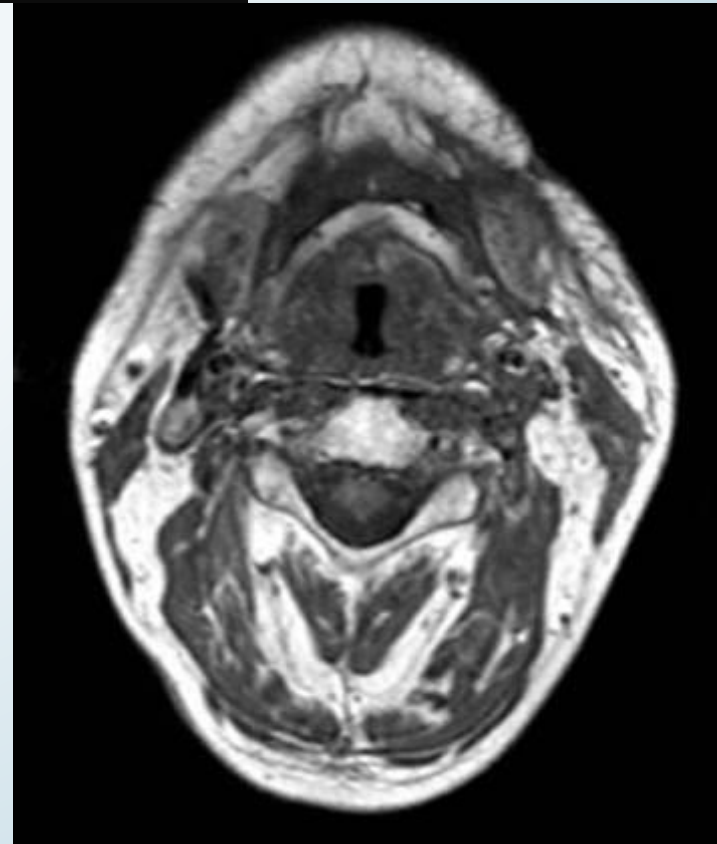
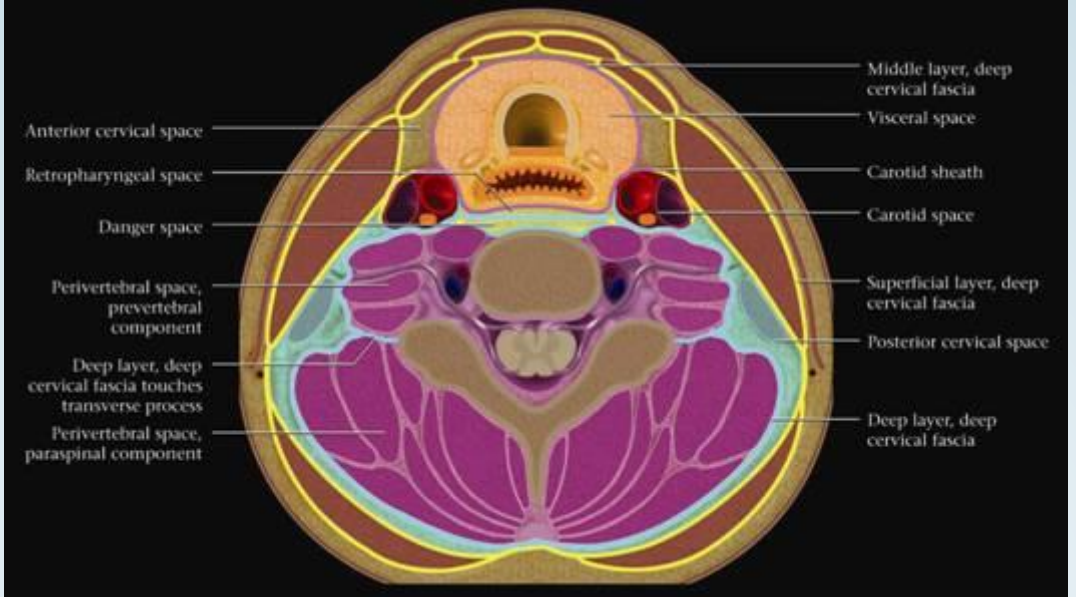
Parapharyngeal space

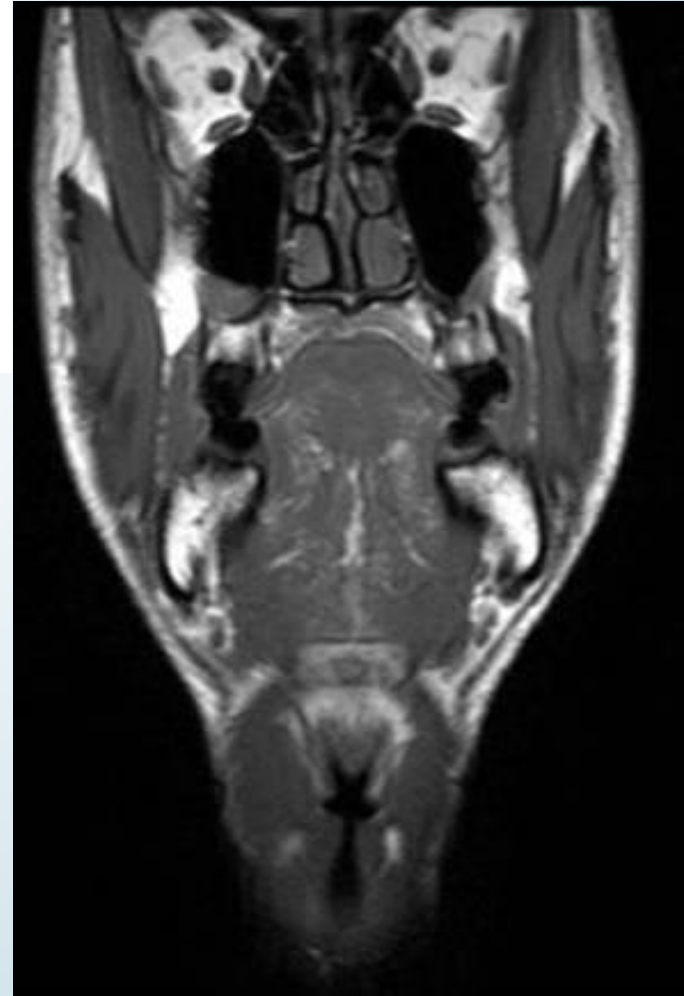
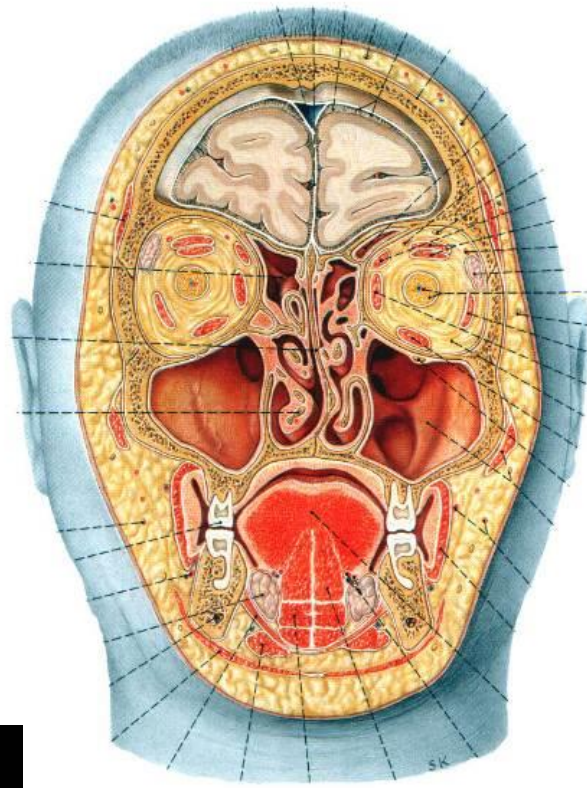
Infrazygomatic masticator space

Superficial layer, deep cervical fascia

Submandibular space



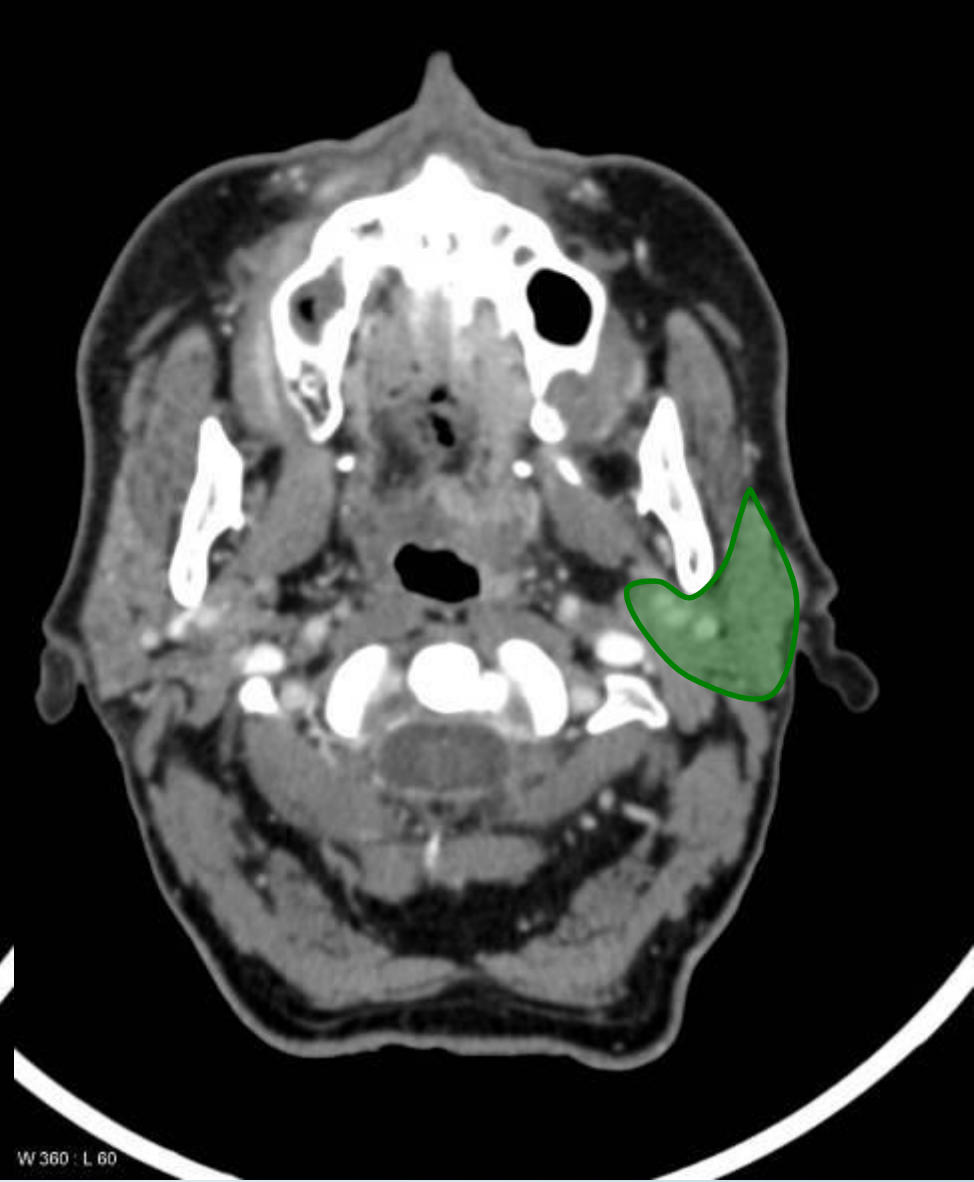




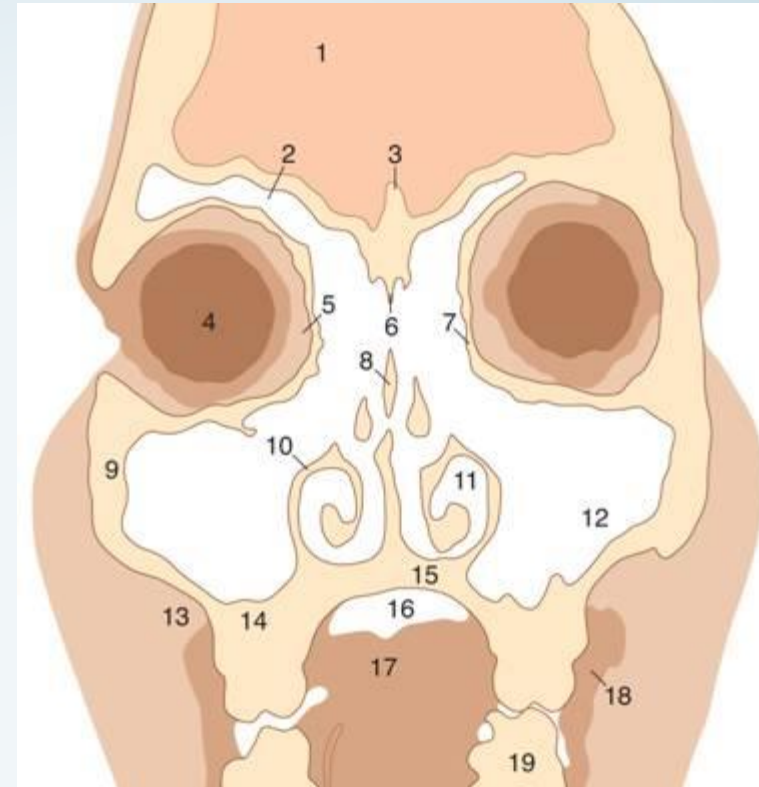
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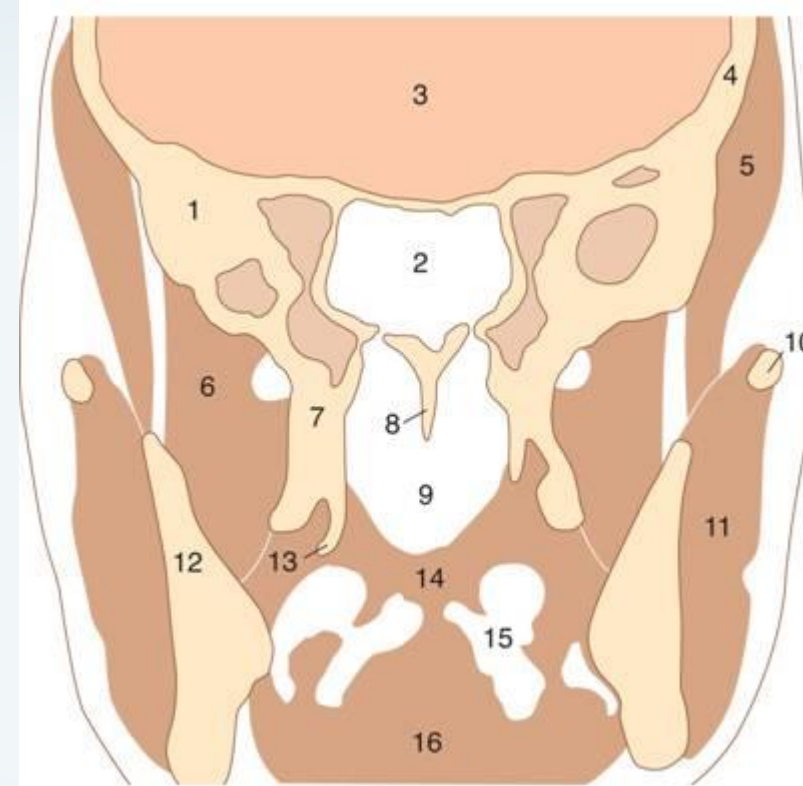
Querschnitt vom Kopf, koronale CT-Aufnahme / 1.



1. Gehirn
2. Sinus frontalis (supraorbitale Ausdehnung)
3. Crista galli
4. Bulbus oculi
5. Corpus adiposum orbitae
6. Lamina perpendicularis ossis ethmoidalis
7. Lamina orbitalis
8. Septum nasi
9. Corpus maxillae
10. Concha nasalis inf.

11. Meatus nasi inf.
12. Sinus maxillaris (Highmore Bucht)
13. Corpus adiposum buccae
14. Processus alveolaris maxillae
15. Palatum durum
16. Cavum oris
17. Zunge
18. M. buccinator
19. Arcus dentalis inf.

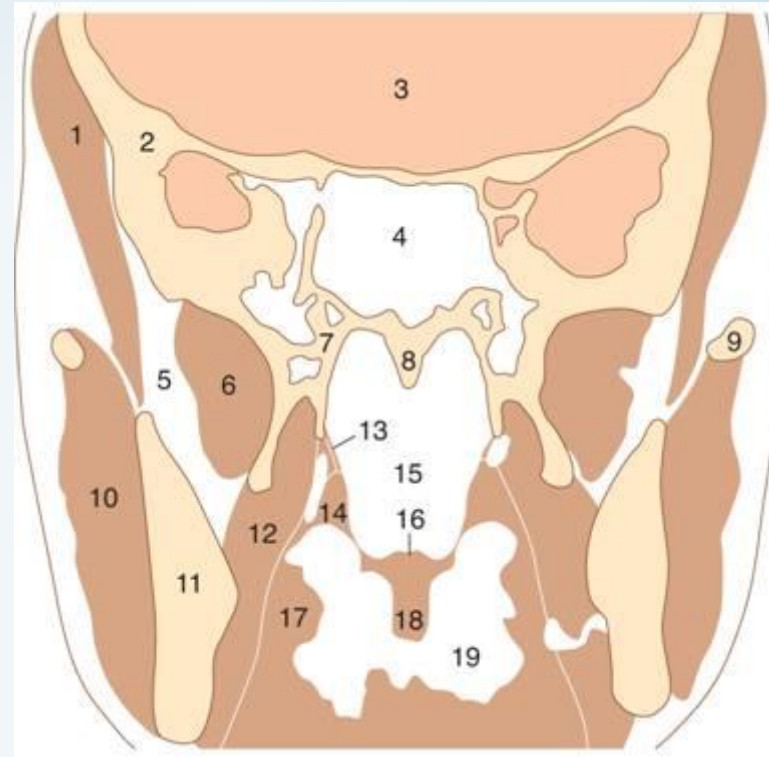
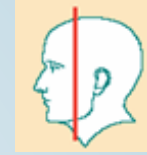
Querschnitt vom Kopf, koronale CT-Aufnahme / 3.



1. Ala major
2. Sinus sphenoidalis
3. Gehirn
4. Squama temporalis
5. M. temporalis
6. Fossa infratemporalis
7. Proc. pterygoideus
8. Vomer

9. Nasopharynx
10. Arcus zygomaticus
11. M. masseter
12. Mandibula
13. Hamulus pterygoideus
14. Palatum molle
15. Cavum oris
16. Zunge

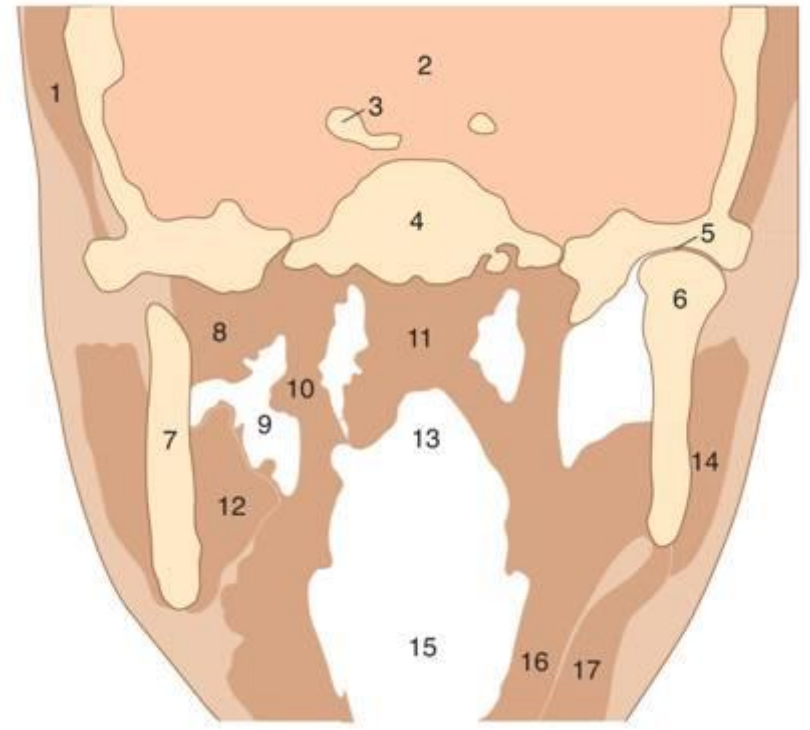
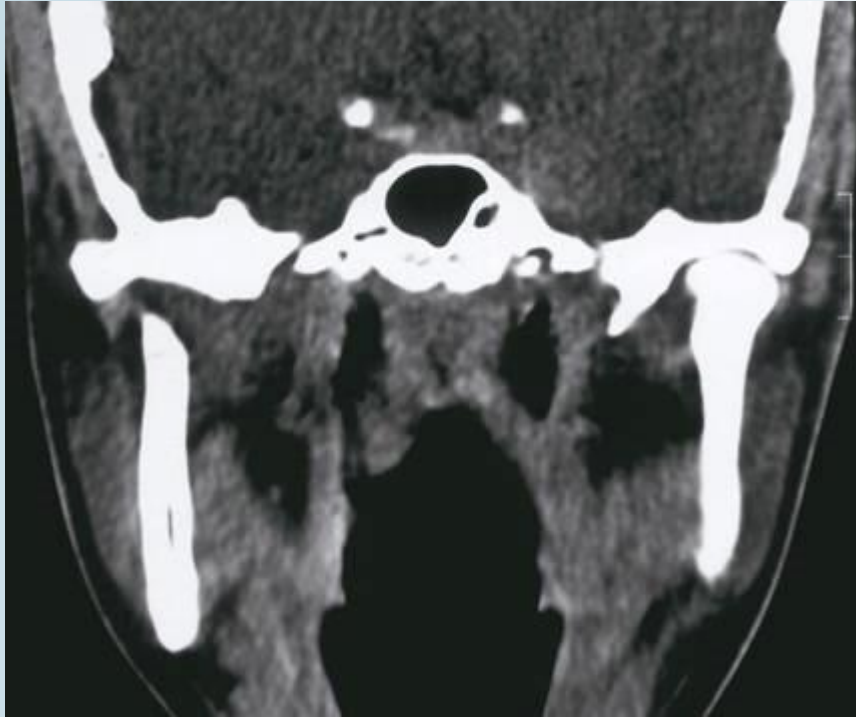
Querschnitt vom Kopf, koronale CT-Aufnahme / 4.



1. M. temporalis
2. Ala major
3. Gehirn
4. Sinus sphenoidalis
5. Fossa infratemporalis
6. M. pterygoid. lat.
7. Proc. pterygoideus
8. Vomer
9. Arcus zygomaticus
10. M. masseter

11. Mandibula
12. M. pterygoideus med.
13. M. levator veli palatini
14. M. tensor veli palatini
15. Nasopharynx
16. Palatum molle
17. Tonsilla palatina
18. Uvula
19. Cavum oris

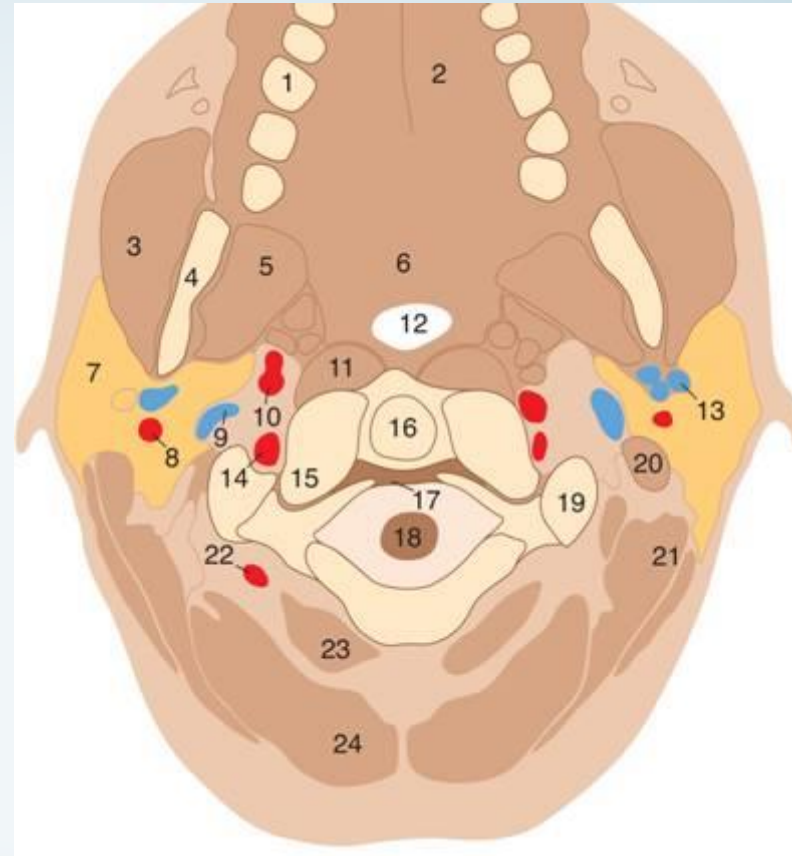
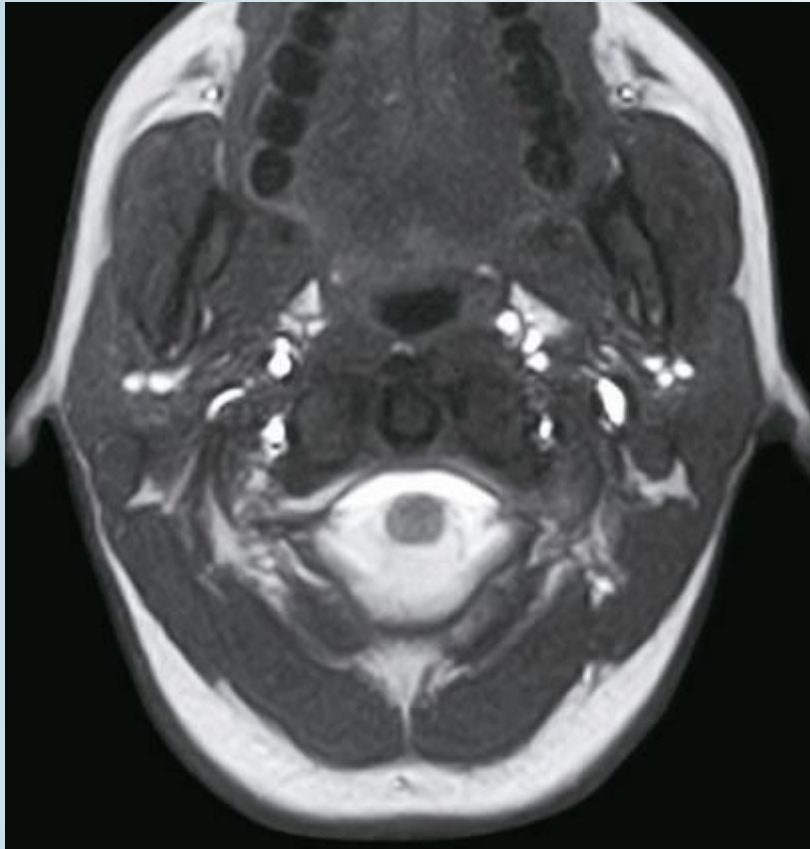
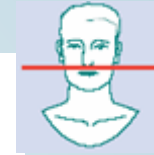
Querschnitt vom Kopf, koronale CT-Aufnahme / 6.



1. M. temporalis
2. Gehirn
3. Proc. clinoideus ant.
4. Corpus ossis sphenoidalis
5. Art. temporomandibularis
6. Proc. condylaris mandibulae
7. Ramus mandibulae
8. M. pterygoid. lat.
9. Spatium parapharyngeum

10. M. constrictor pharyng. sup.
11. Paries dors. nasopharyngis
12. M. pterygoid. med.
13. Nasopharynx
14. M. masseter
15. Oropharynx
16. M. mylohyoideus
17. M. digastricus

Querschnitt vom Kopf, axiale MRT-Aufnahme / 1.

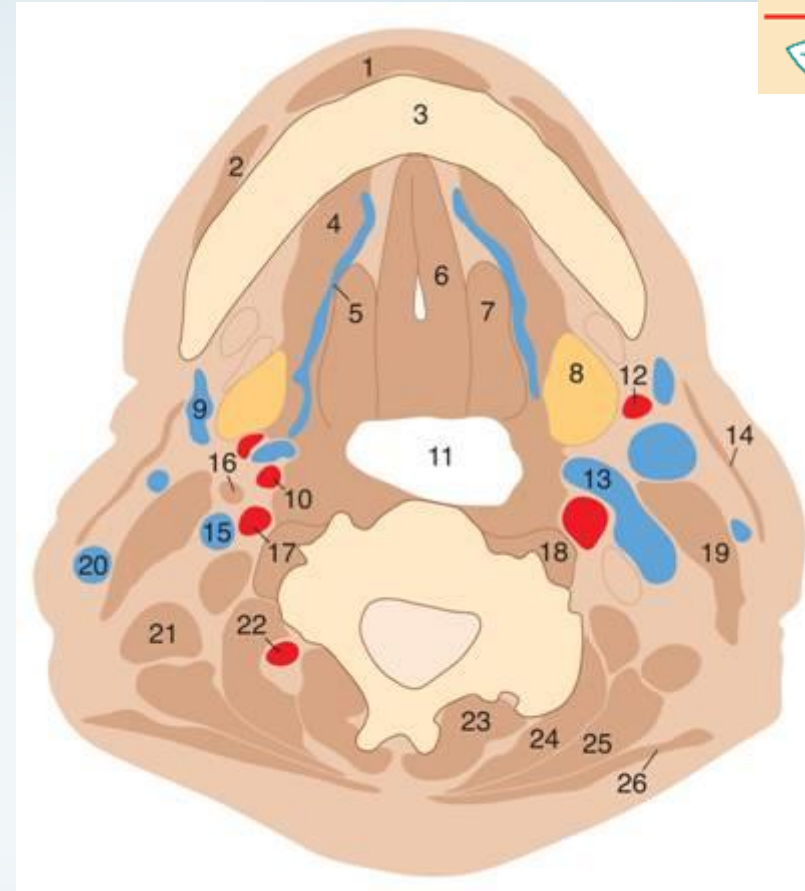
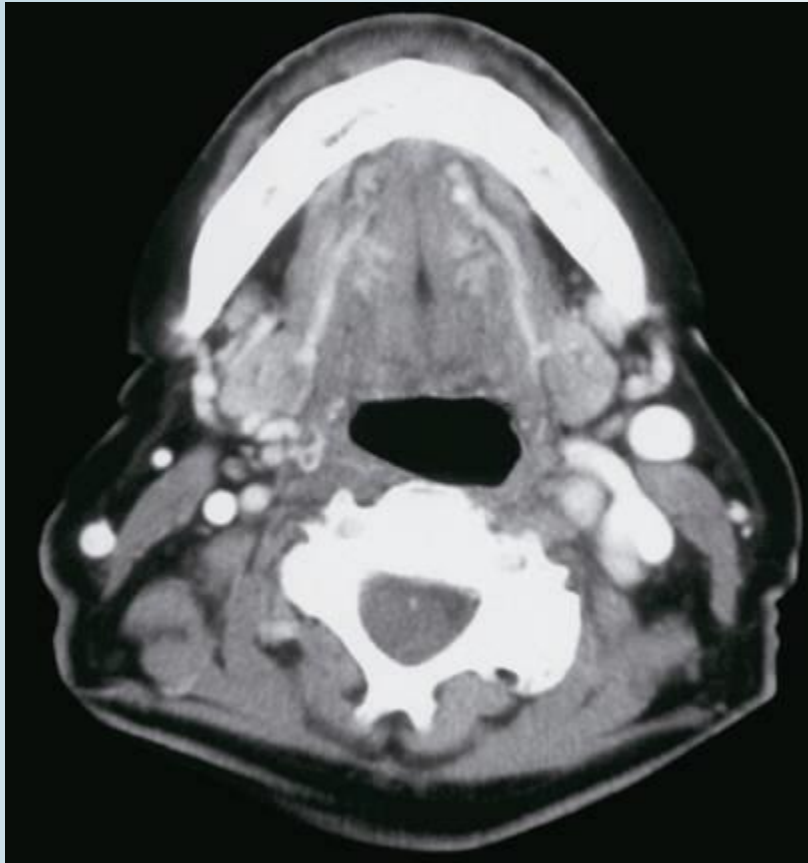
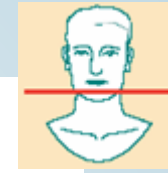


1. Arcus dentalis sup.
2. Palatum durum
3. M. masseter
4. Ramus mandibulae
5. M. pterygoideus med.
6. Palatum molle
7. Gl. parotis (Lob. superf.)
8. A. carotis ext.

9. V. jugularis int.
10. A. carotis int.
11. Mm. longi colli et capitis
12. Nasopharynx
13. V. retromandibularis
14. A. vertebralis
15. Facies artic. sup. atlantis
16. Dens axis

17. Lig. transversum atlantis
18. Medulla spinalis
19. Massa lateralis atlantis
20. Venter post. m. digastrici
21. Mm. sternocleidomastoideus et splenius capitis
22. A. et v. cervicales proff.
23. Mm. suboccipitales
24. M. semispinalis capitis

Querschnitt vom Hals, axiale CT-Aufnahme / 2.

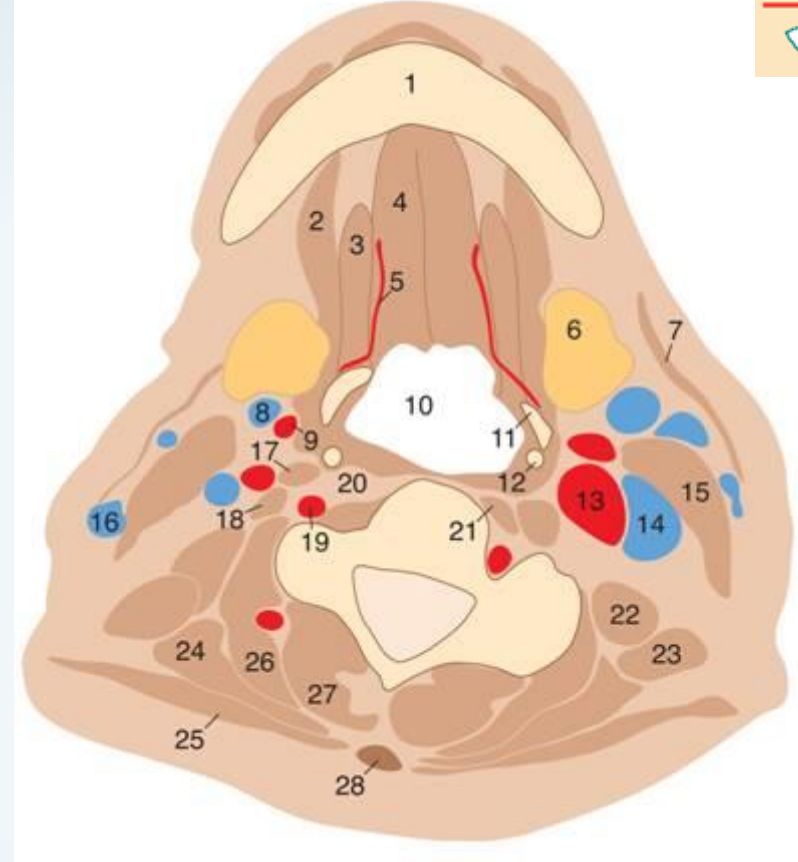
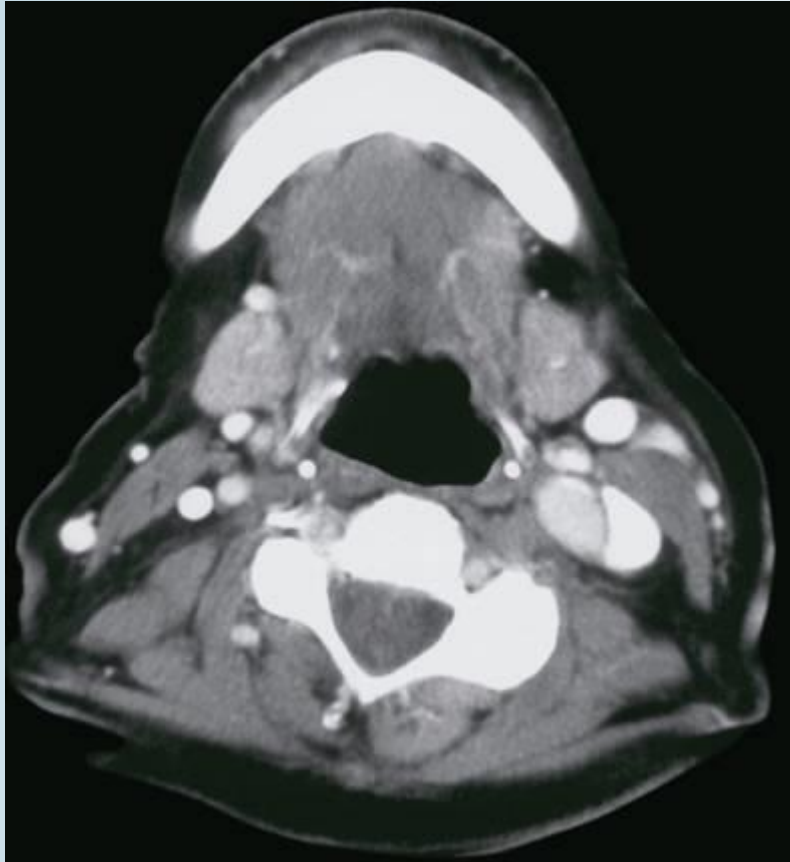
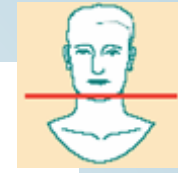


1. M. mentalis
2. M. depressor angulis oris
3. Mandibula
4. M. mylohyoideus
5. V. sublingualis, Sulcus lateralis linguae
6. M. genioglossus
7. M. hyoglossus
8. Gl. submandibularis
9. V. facialis

10. A. carotis ext.
11. Oropharynx
12. A. facialis
13. V. facialis communis
14. Platysma
15. V. jugularis int.
16. M. stylohyoideus
17. A. carotis int.
18. Mm. longi capitis et colli

19. M. sternocleidomast.
20. V. jugularis ext.
21. M. levator scapulae
22. A. cervic. prof.
23. M. semispin. cerv.
24. M. semispin. capit.
25. M. splenius capitis
26. M. trapezius

Querschnitt vom Hals, axiale CT-Aufnahme / 3.

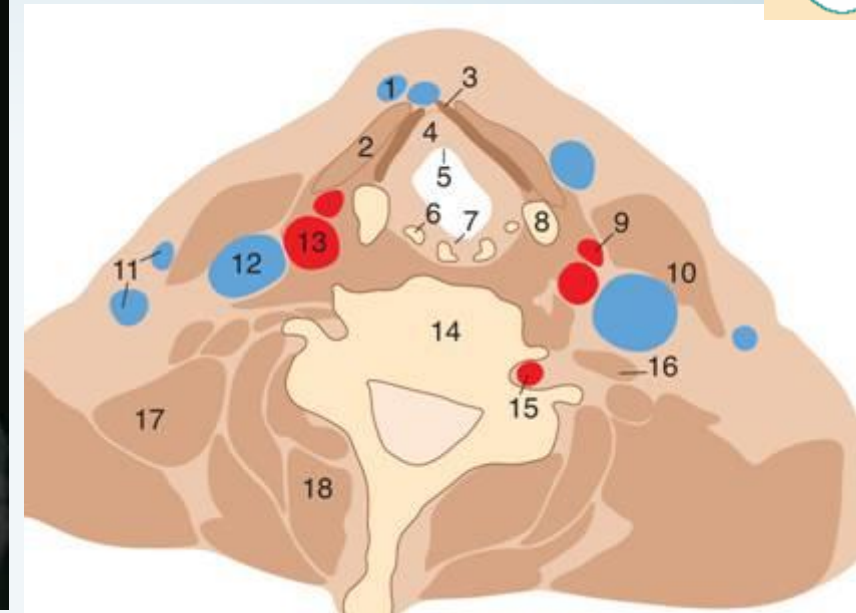
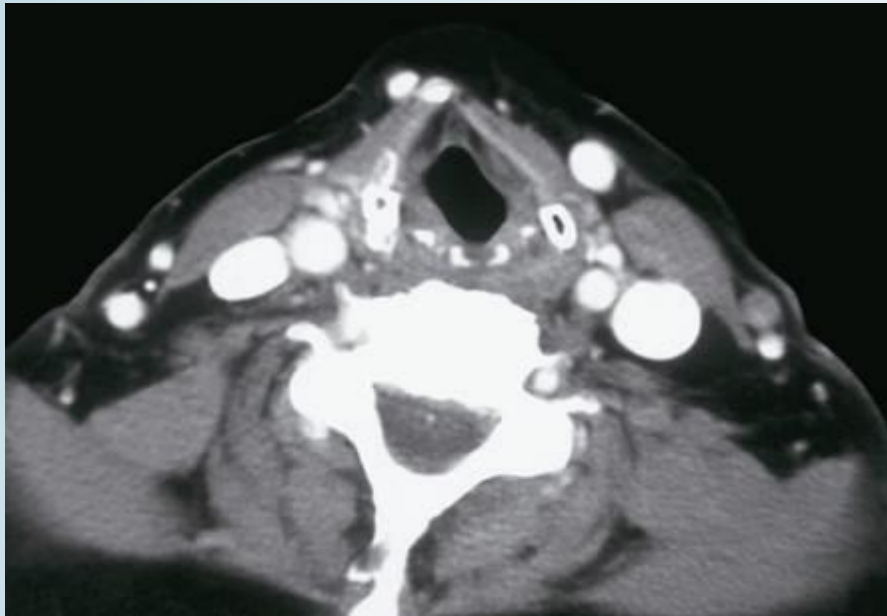
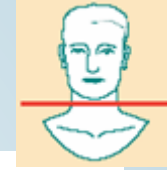


1. Mandibula
2. M. mylohyoideus
3. M. hyoglossus
4. M. genioglossus
5. A. lingualis
6. Gl. submandibularis
7. Platysma
8. V. facialis
9. A. carotis ext.

10. Oropharynx
11. Os hyoideum
12. Cart. thyroidea, cornu sup.
13. A. carotis int.
14. V. jugularis int.
15. M. sternocleidomastoideus
16. V. jugularis ext.
17. M. scalenus ant.
18. M. scalenus medius

19. A. vertebralis
20. Spatium retropharyngeum
21. Mm. longi capitis et colli
22. M. scalenus post.
23. M. levator scapulae
24. M. splenius capitis
25. M. trapezius
26. Mm. longissimi et semispin. capit.
27. M. semispinalis cervicis
28. Lig. nuchae

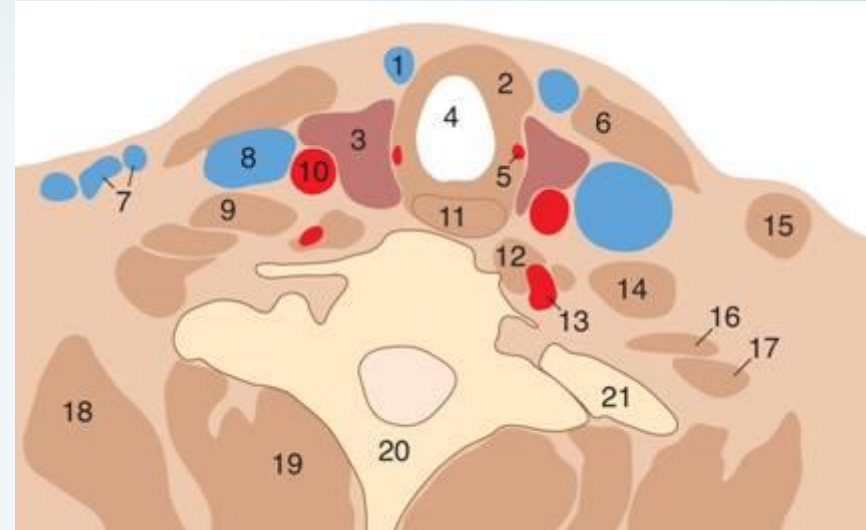
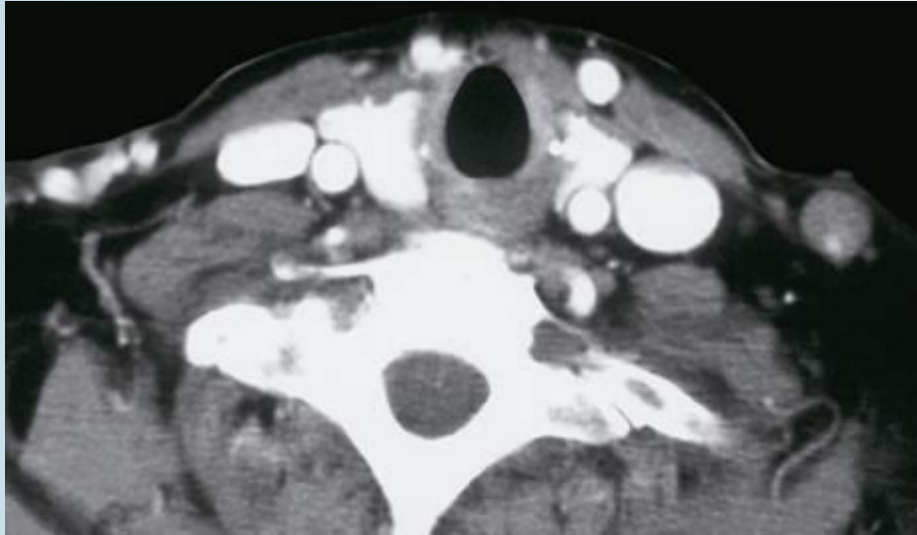
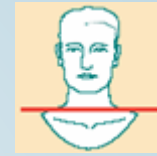
Querschnitt vom Hals, axiale CT-Aufnahme / 4.



1. V. jugularis ant.
2. Mm. infrahyoidei
3. Membrana thyrohyoidea
4. Corpus adiposum laryngis
5. Epiglottis
6. Cartilago cuneiformis
7. Cartilago corniculata
8. Cartilago thyroidea
9. A. thyroidea sup.

10. M. sternocleidomastoideus
11. V. jugularis ext.
12. V. jugularis int.
13. A. carotis comm.
14. Vertebra cervicalis V.
15. A. vertebralis
16. M. scalenus medius
17. M. levator scapulae
18. M. erector spinae

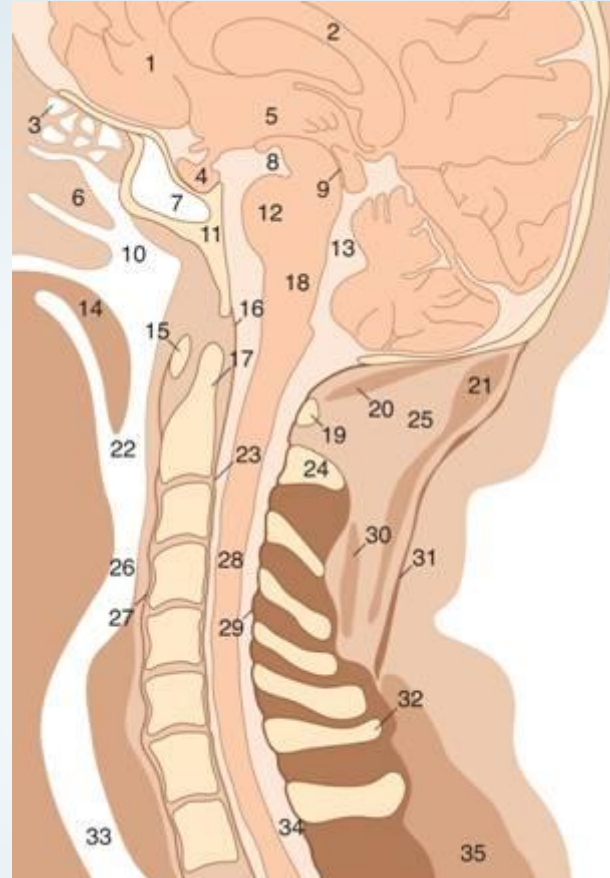
Querschnitt vom Hals, axiale CT-Aufnahme / 6.



1. V. jugularis ant.
2. Trachea et Mm. infrahyoidei
3. Gl. thyroidea
4. Trachea, Lumen
5. A. laryngea inf.
6. M. sternocleidomastoideus, Insertio sternalis
7. V. jugularis ext.
8. V. jugularis int.
9. M. scalenus ant.
10. A. carotis comm.
11. Oesophagus

12. M. longus colli
13. A. vertebralis
14. M. scalenus ant.
15. M. sternocleidomastoideus, Insertio clavicularis
16. M. scalenus medius
17. M. scalenus post.
18. M. levator scapulae
19. M. erector spinae
20. Vertebra thoracica I., Lamina et Proc. spinosus
21. I. Rippe

Kopf – Hals, sagittale MRT-Aufnahme

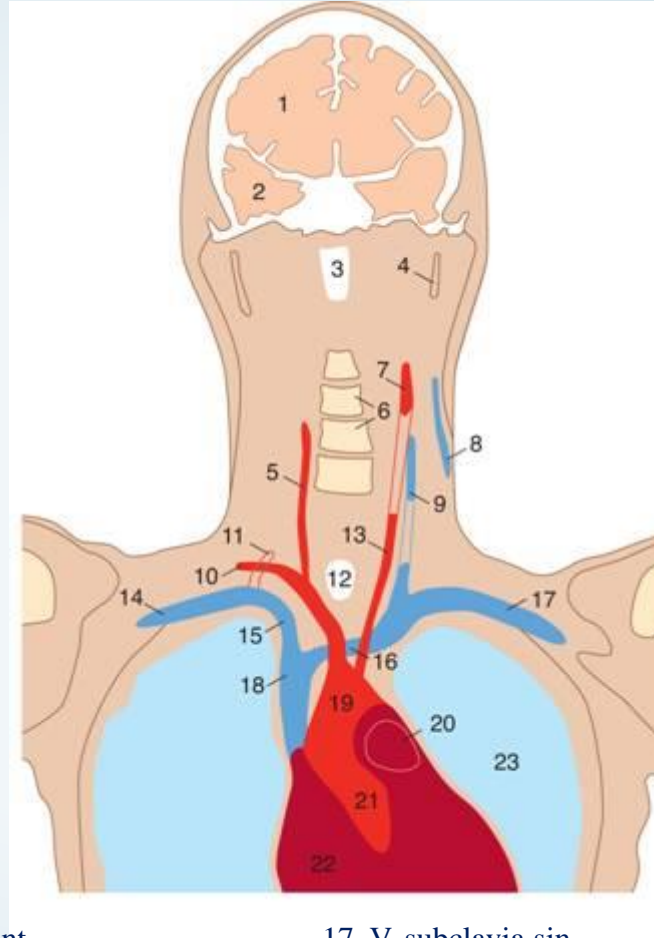
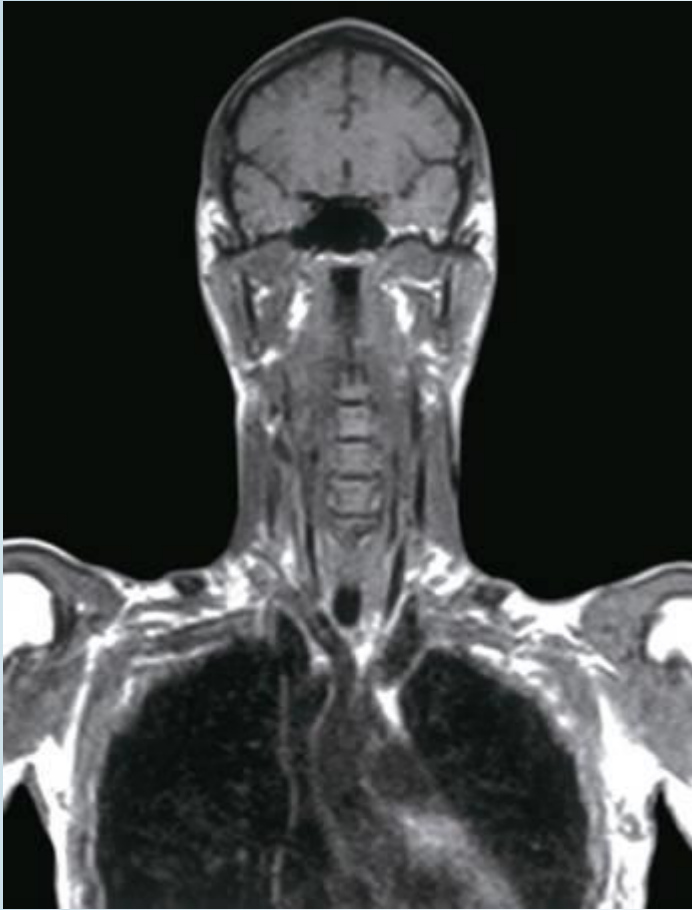


1. Gehirn, Lobus frontalis
2. Corpus callosum
3. Cellulae ethmoidales
4. Hypophyse
5. III. Hirnventrikel
6. Nasenhöhle
7. Sinus sphenoidalis
8. Fossa interpeduncularis
9. Aqueductus cerebri, Mesencephalon
10. Nasopharynx
11. Clivus
12. Pons
13. IV. Hirnventrikel
14. Palatum molle
15. Atlas, Arcus ant.
16. Membrana tectoria
17. Dens axis
18. Medulla oblongata
19. Atlas, Arcus post.
20. M. rectus capitis post. minor

21. M. semispinalis capitis
22. Oropharynx
23. Lig. longitudinale post.
24. Axis, Proc. spinosus
25. Suboccipitales Fettgewebe
26. Laryngopharynx
27. Lig. longitudinale ant.

28. Medulla spinalis
29. Ligamenta flava
30. M. semispinalis cervicis
31. Lig. nuchae
32. Vertebra cervicalis VII., Proc. spinosus
33. Trachea
34. Spatium subarachnoideale (Theca)
35. M. erector spinae

Kopf – Hals, koronale MRT-Aufnahme / 1.

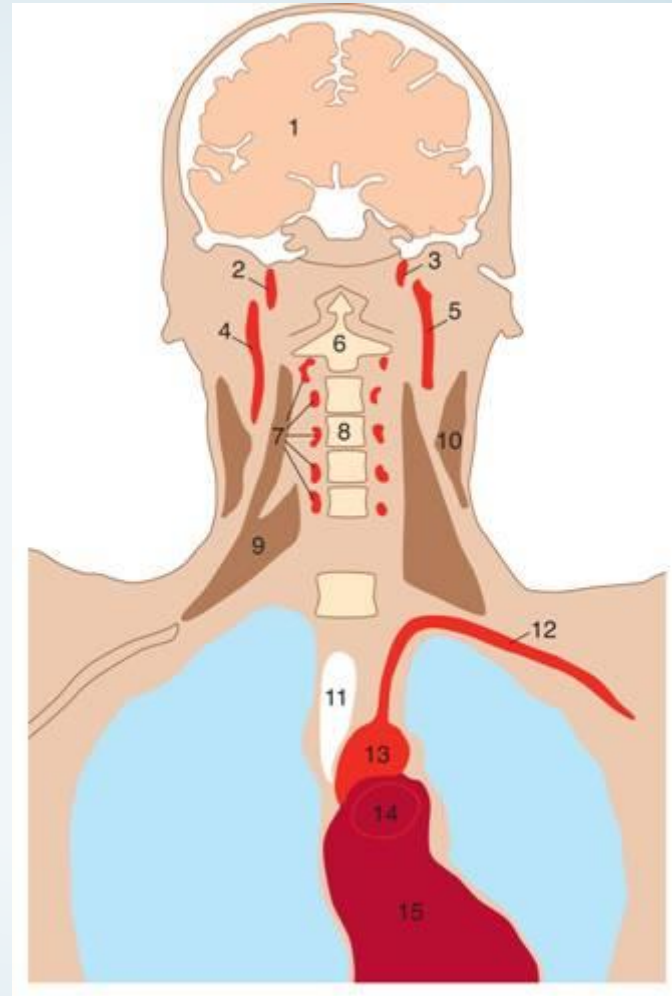
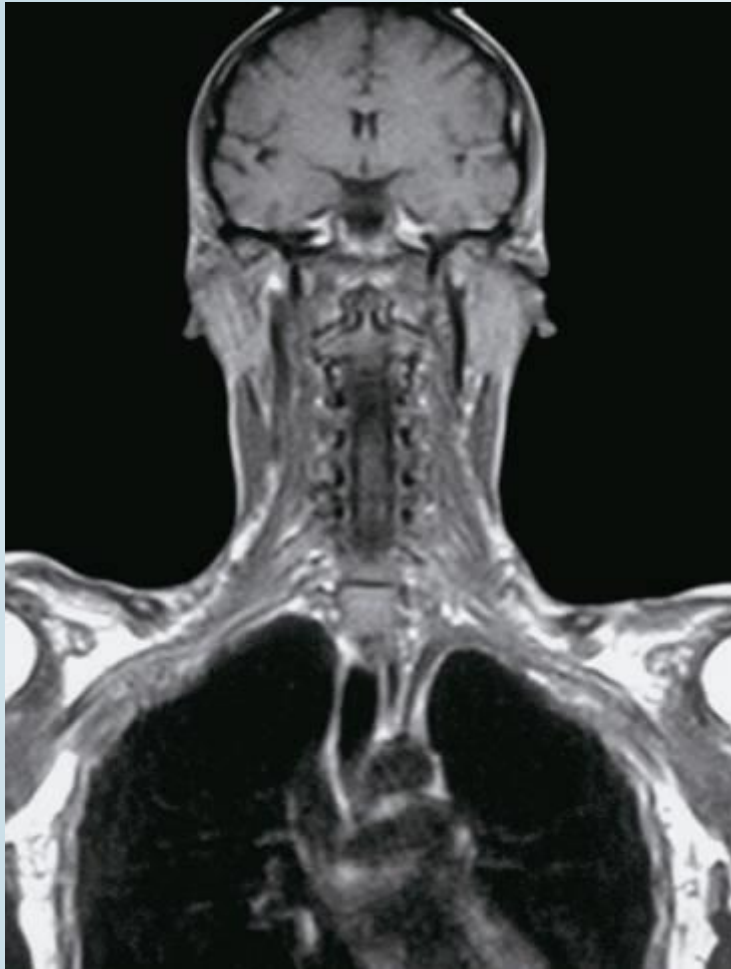


1. Gehirn, Lobus parietalis
2. Gehirn, Lobus temporalis
3. Nasopharynx
4. Ramus mandibulae
5. A. carotis comm. dextra
6. Vertebrae cervicales
7. A. carotis int. sin.
8. V. jugularis ext.

9. V. jugularis int.
10. A. subclavia dextra
11. Ansatz des M. scalenus ant.
12. Trachea
13. A. carotis comm. sin.
14. V. subclavia dext.
15. V. brachiocephalica dext.
16. V. brachiocephalica sin.

17. V. subclavia sin.
18. V. cava sup.
19. Arcus aortae
20. A. pulmonalis
21. Aorta ascendens
22. Herz
23. Lunge

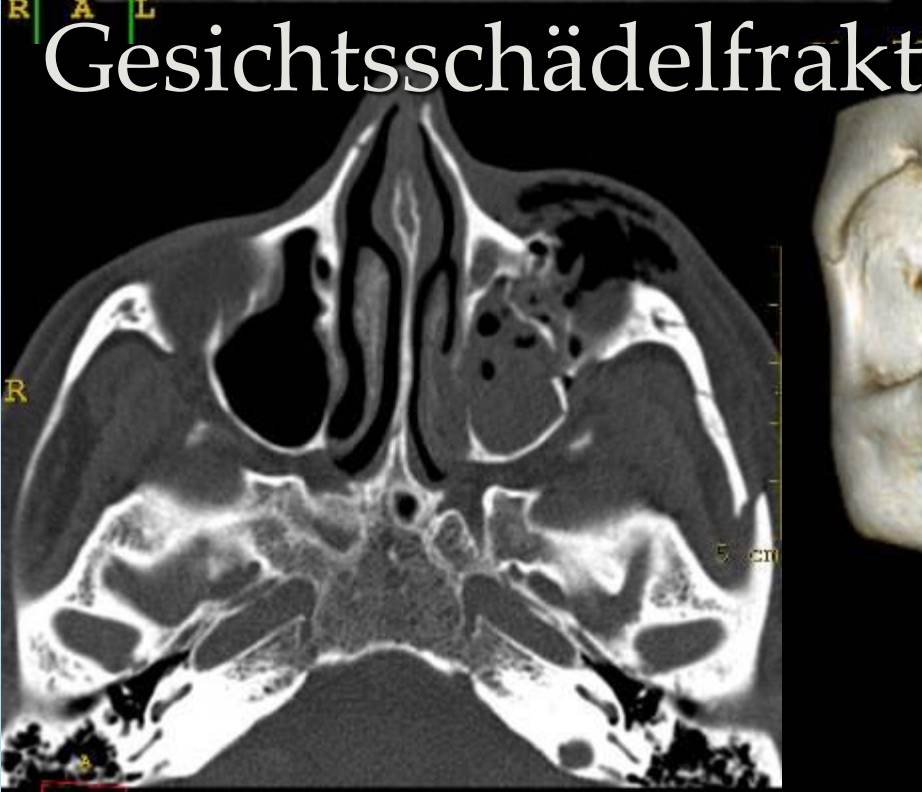
Kopf – Hals, koronale MRT-Aufnahme / 3.



1. Gehirn
2. A. vertebralis dext.
3. A. vertebralis sin.
4. A. carotis int. dext.
5. A. carotis int. sin.

6. Dens axis
7. A. vertebralis
8. Vertebra cervicalis IV.
9. M. scalenus medius et post.
10. M. sternocleidomastoideus

11. Trachea
12. A. subclavia sin.
13. Arcus aortae
14. A. pulmonalis
15. Herz

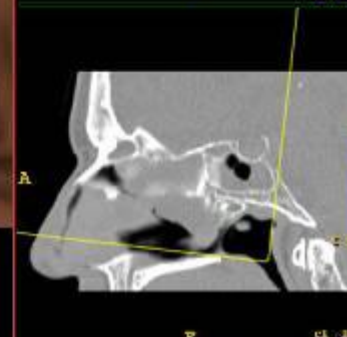
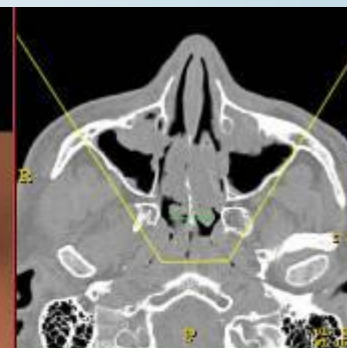
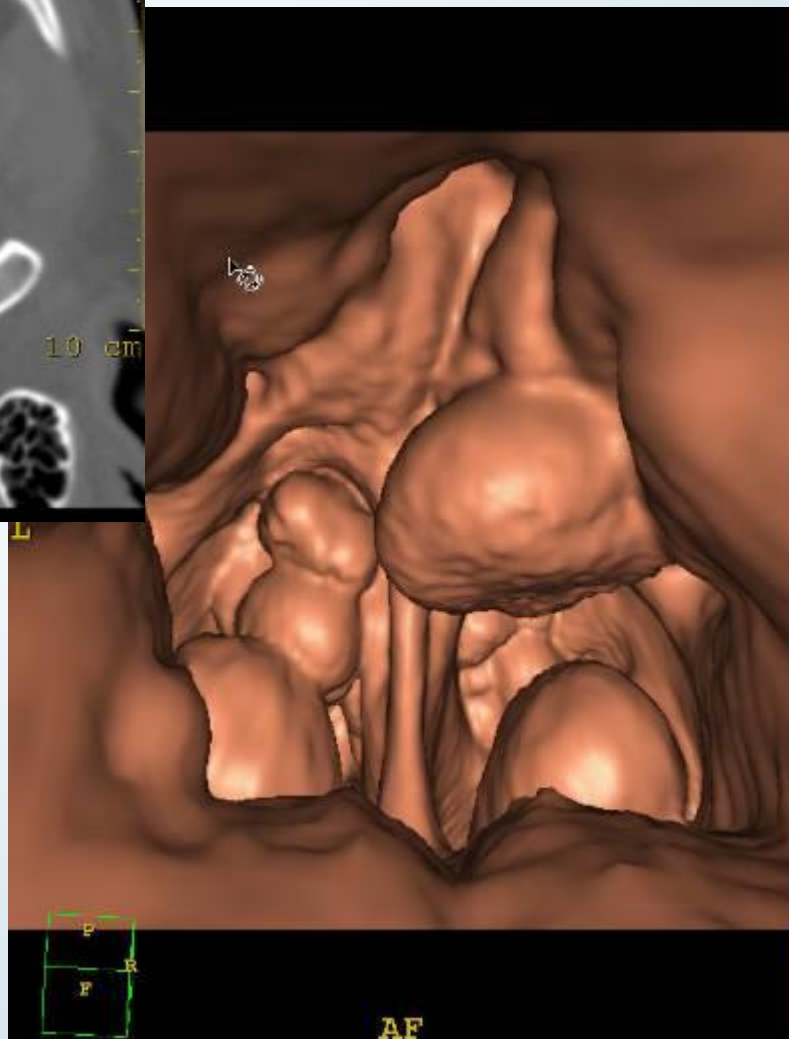
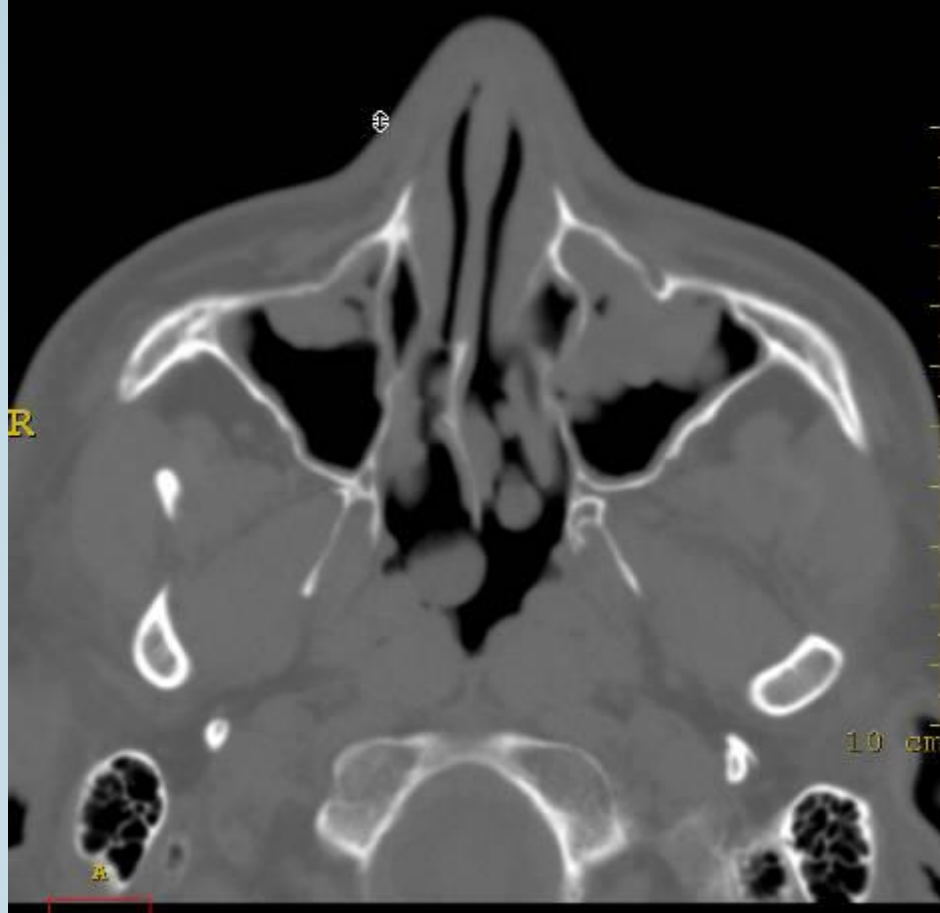


Gesichtsschädelfraktur

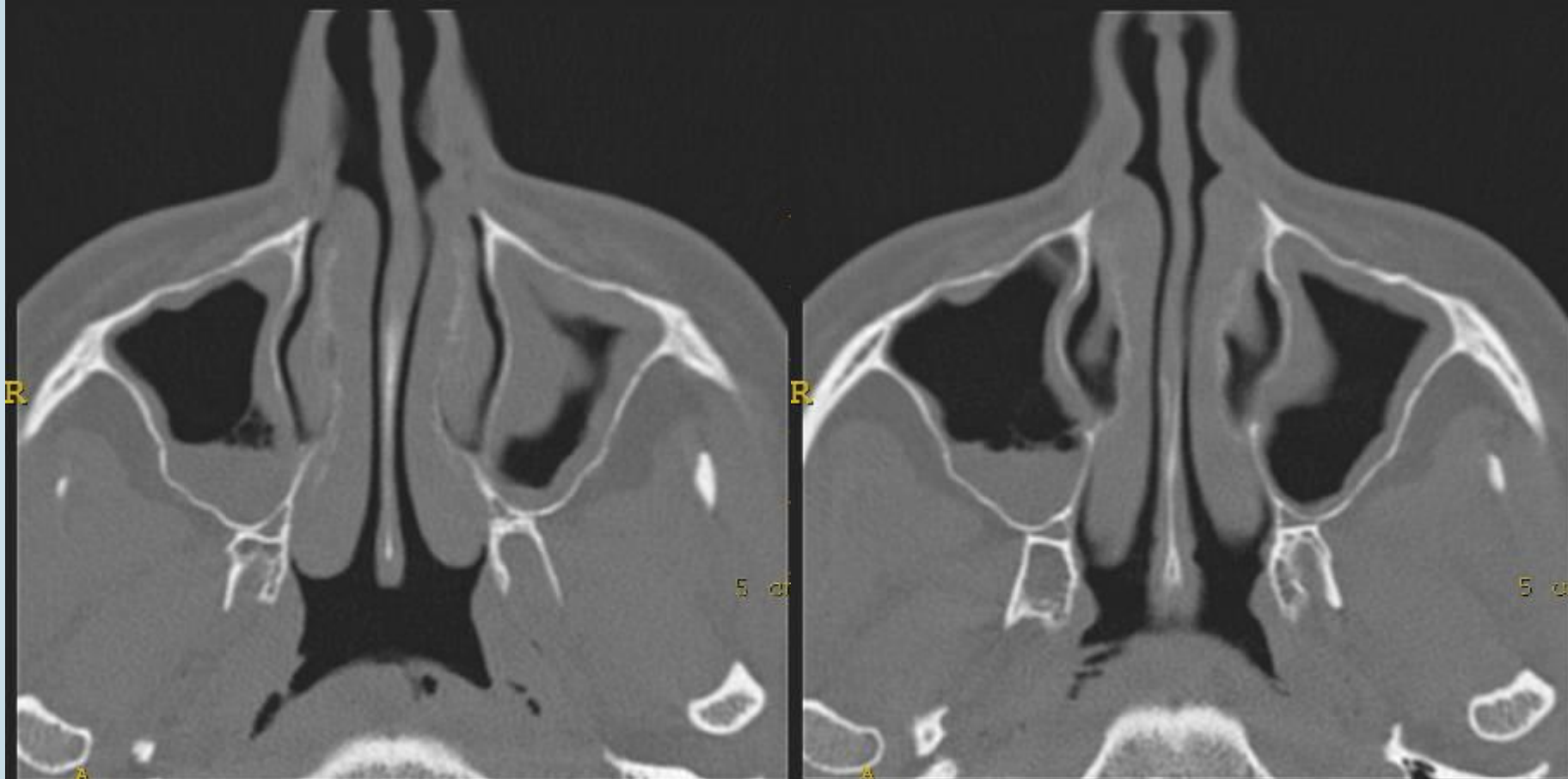
R
H
A
L

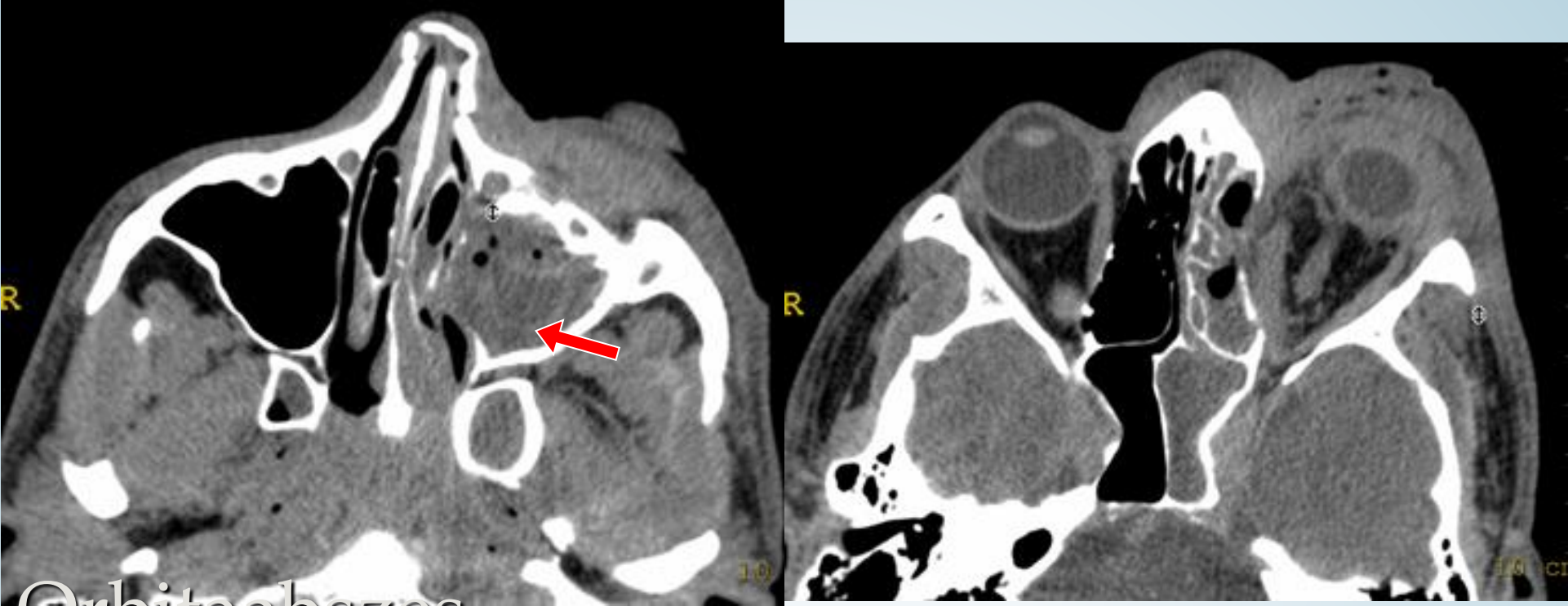
H
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P

sinonasale Polypose



Sinusitis acuta





Orbitaabszess

S

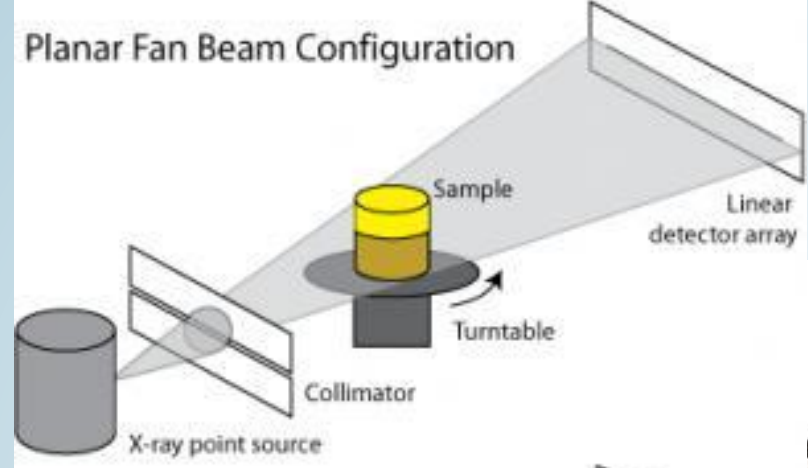


SCHWERPUNKTE DER ANWENDUNG CONEBEAM CT UNTERSUCHUNG

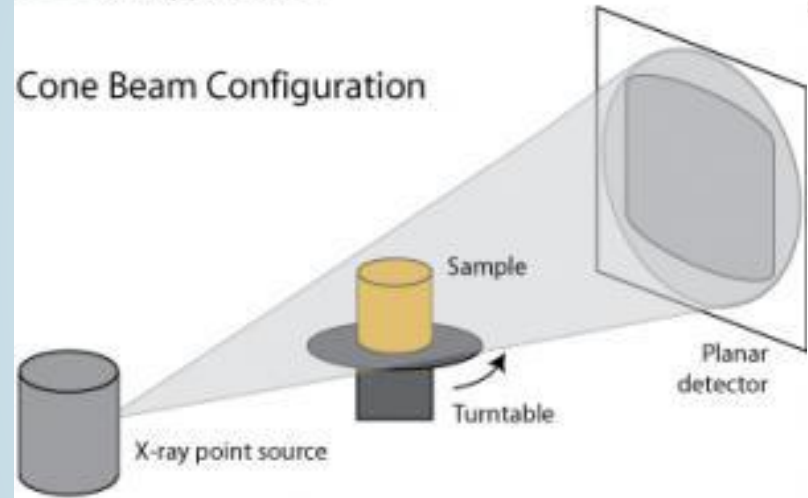
- *Rtg-Strahlung*
- *native Technik*
 - *2D flat panel Detektor (0.4 mm Auflösung)*
 - *Strahlenbelastung wesentlich geringer als beim CT*
 - *max. 100 μSv (\leftrightarrow multidetektor CT ca. 1200-3300 μSv)*
 - *Panoramaaufnahme 10-12 μSv (tägliche Hintergrundstrahlung 8 μSv)*
- *Indikation: Implantologie, MK- Chirurgie, Impactation, TM-Gelenk, Darstellung der Atemwege, Wirbelsäulenuntersuchung, Zahnregulierung*



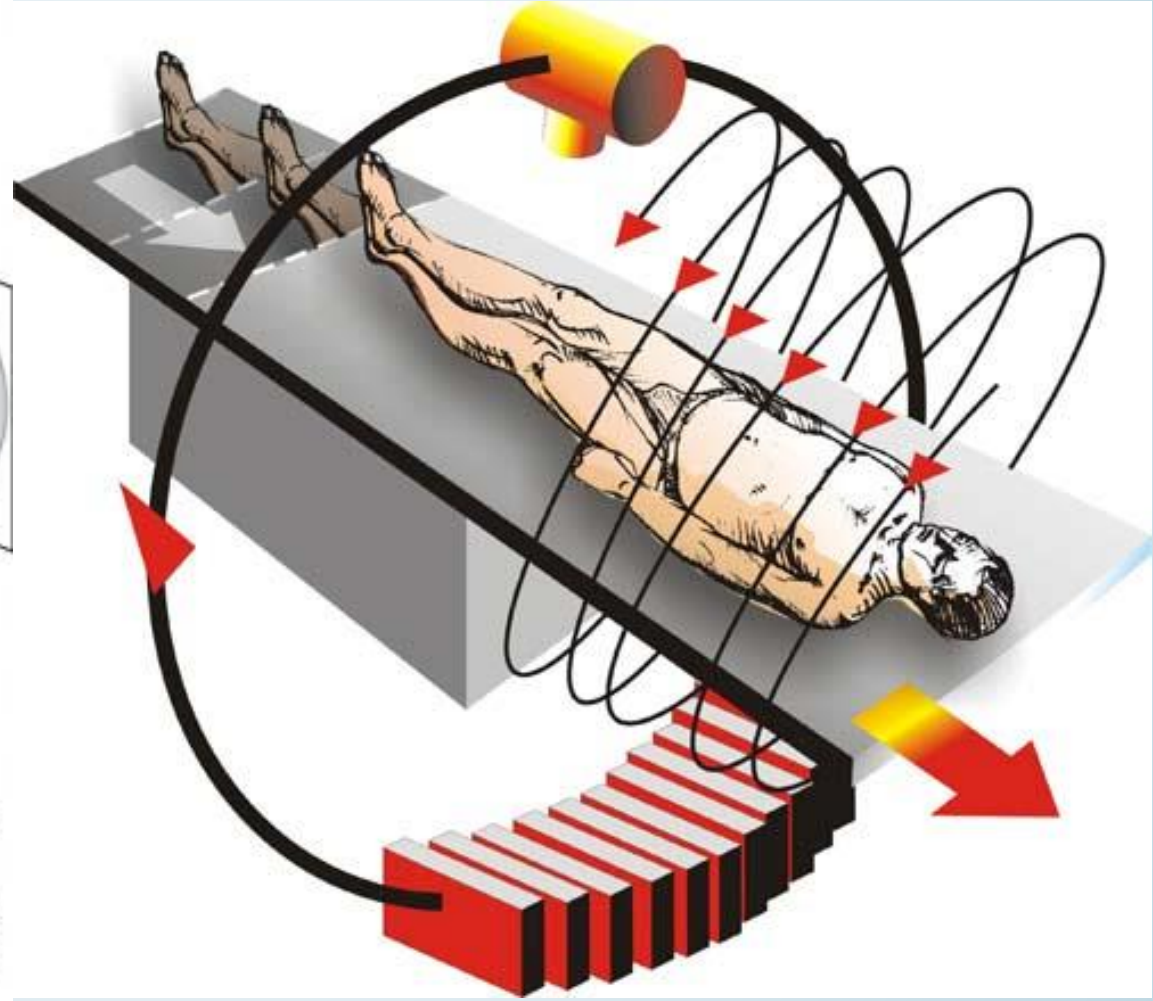
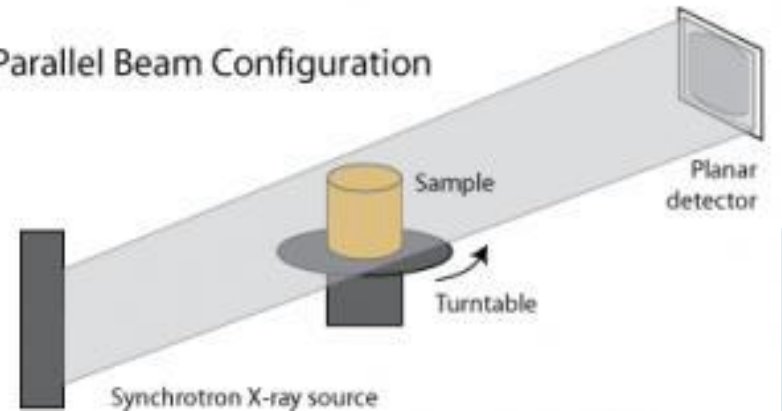
Planar Fan Beam Configuration

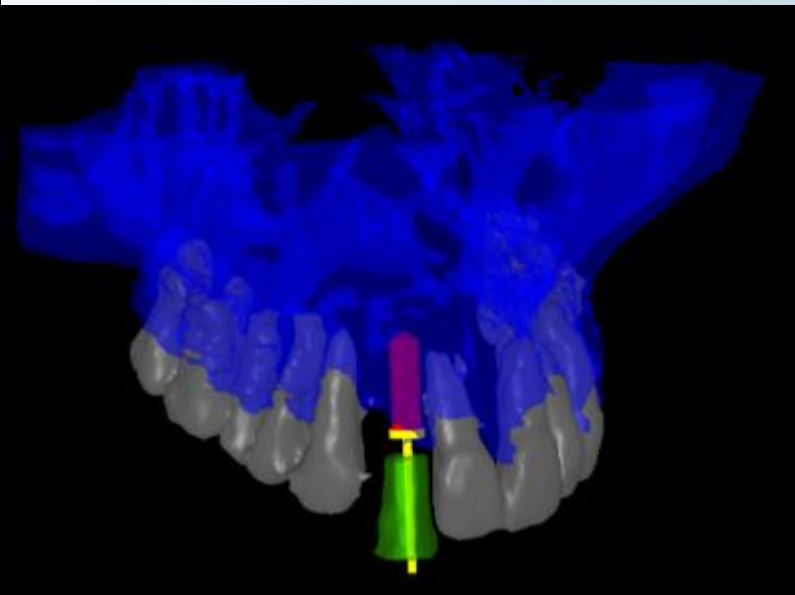
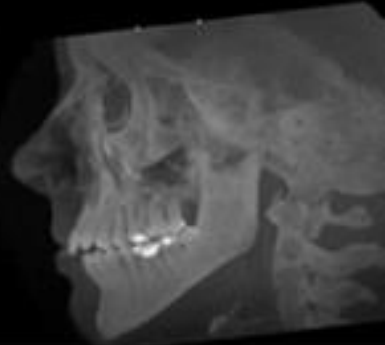
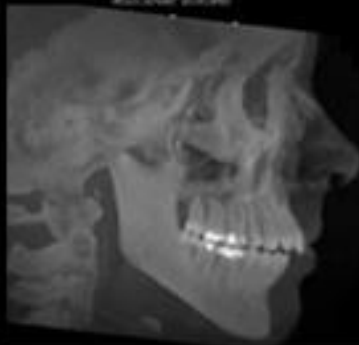
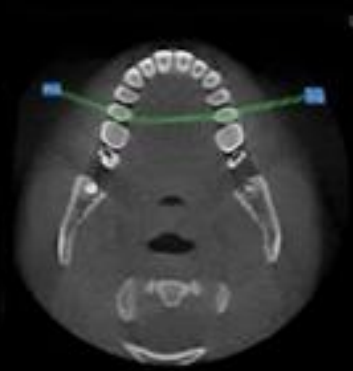


Cone Beam Configuration



Parallel Beam Configuration





VIELEN DANK FÜR IHRE AUFMERKSAMKEIT!

