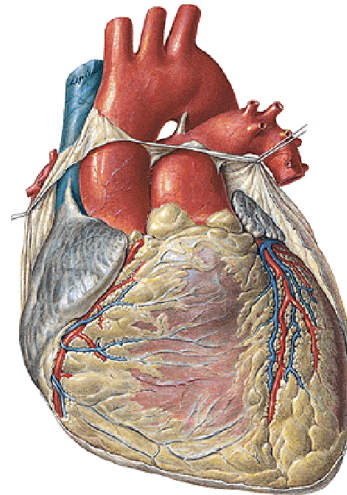
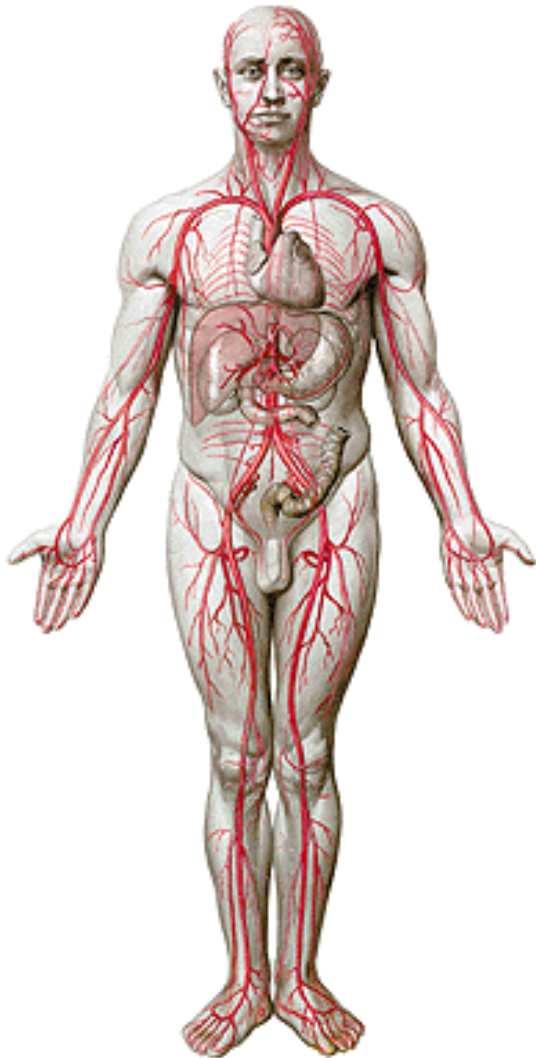


# SYSTEMA CARDIOVASCULARE



# **SOUČÁSTI KARDIOVASKULÁRNÍ SOUSTAVY**

**SRDCE (COR)**

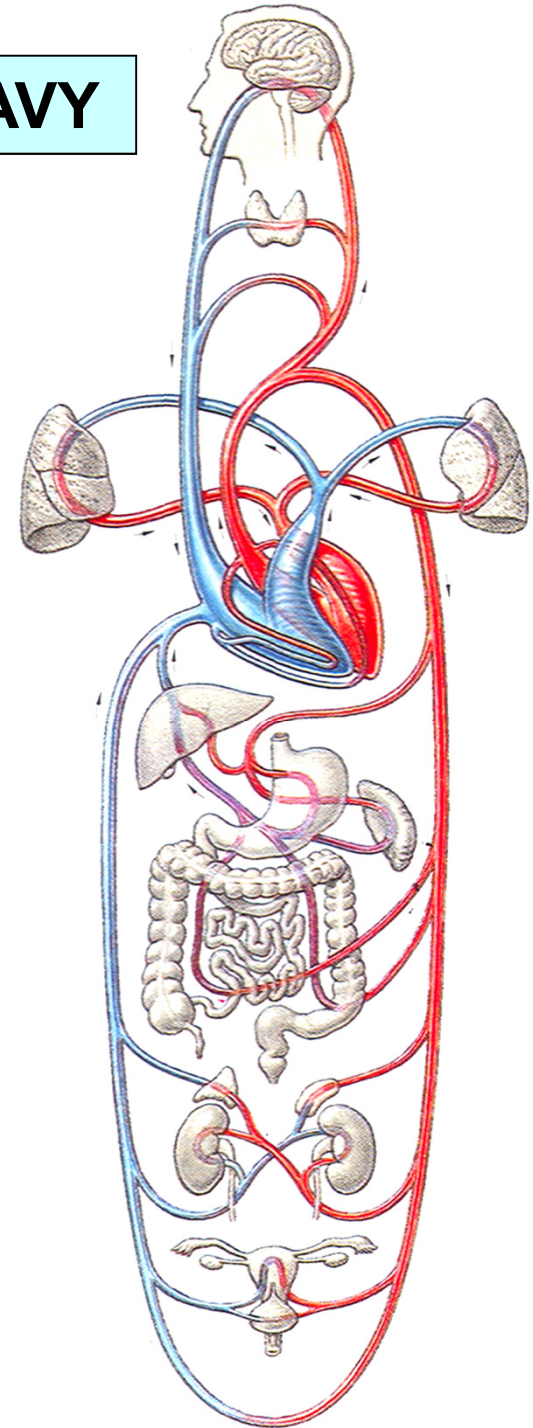
**CÉVY (VASA)**

**KREV (SANGUIS)**

**VELKÝ KREVNÍ OBĚH**

**MALÝ KREVNÍ OBĚH (PLICNÍ)**

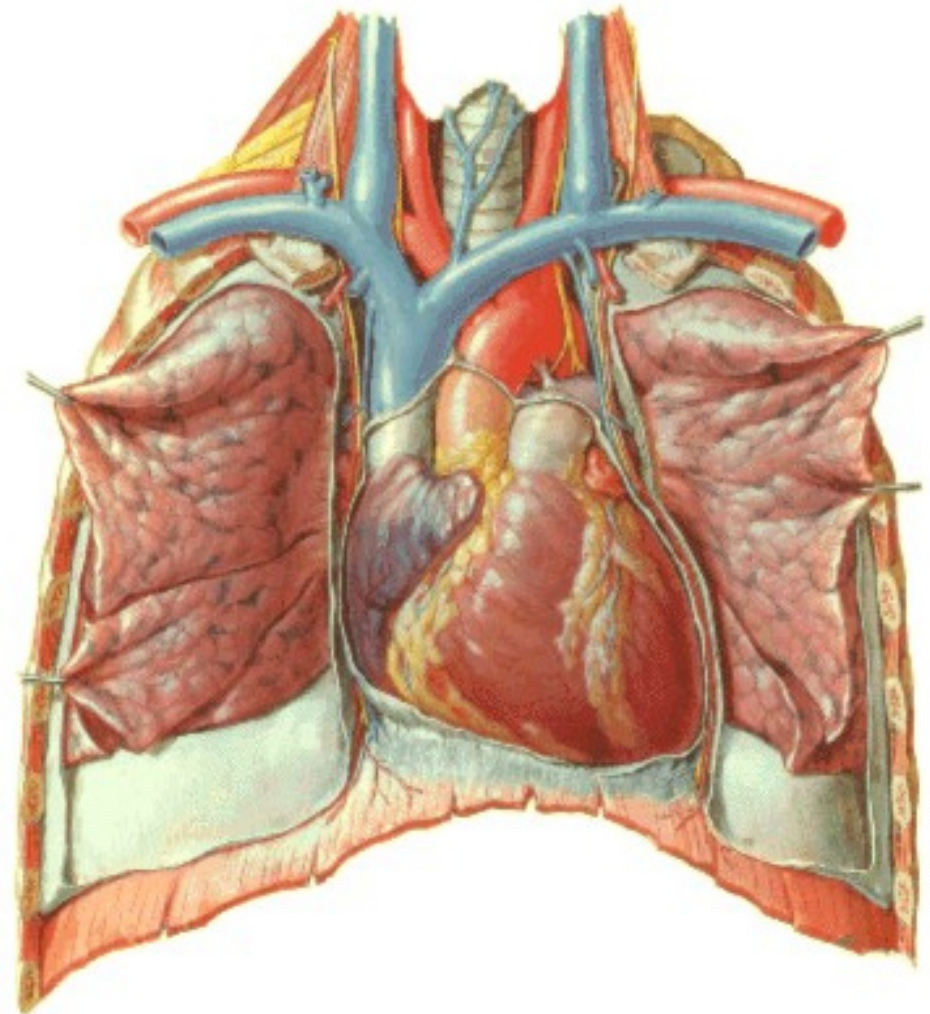
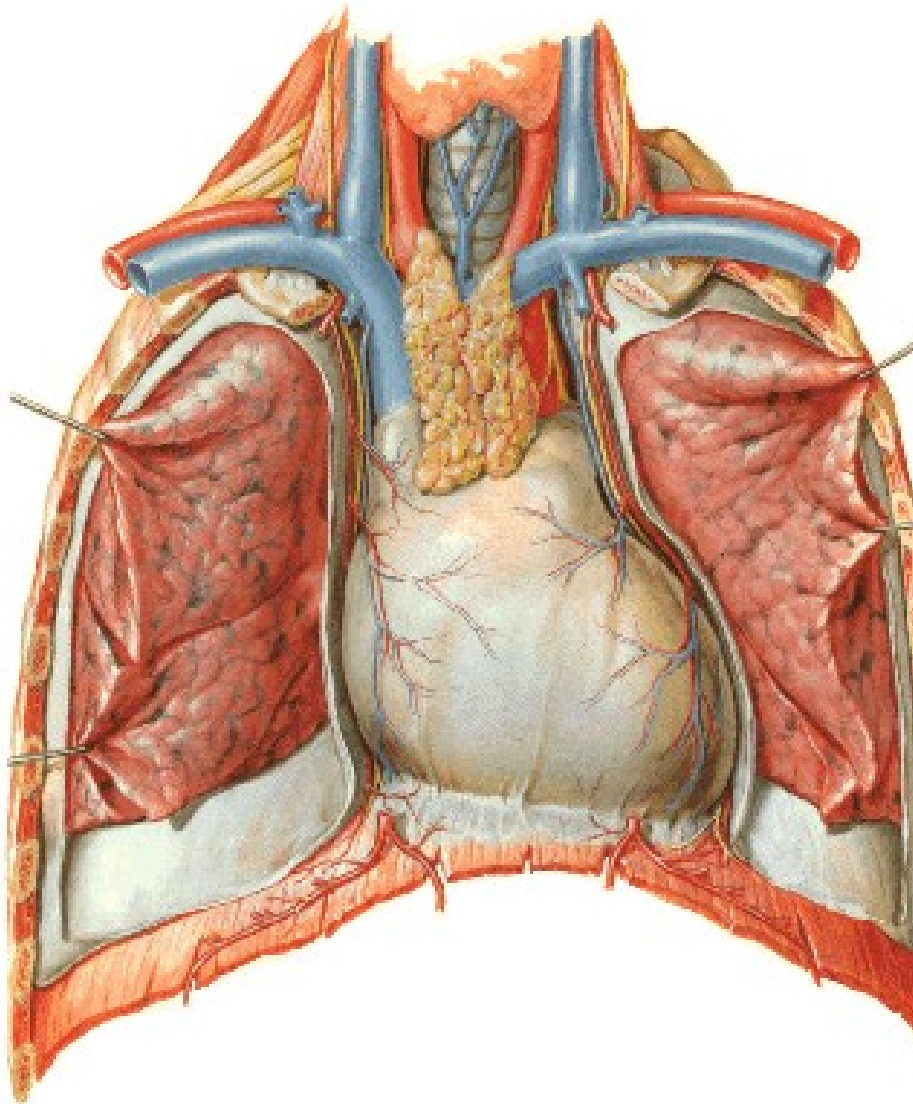
**PORTÁLNÍ OBĚH (JATERNÍ)**



# COR (SRDCE)

270-320 g

2/3 vlevo, 1/3 vpravo



## ZEVNÍ POPIS SRDCE

**Basis cordis**

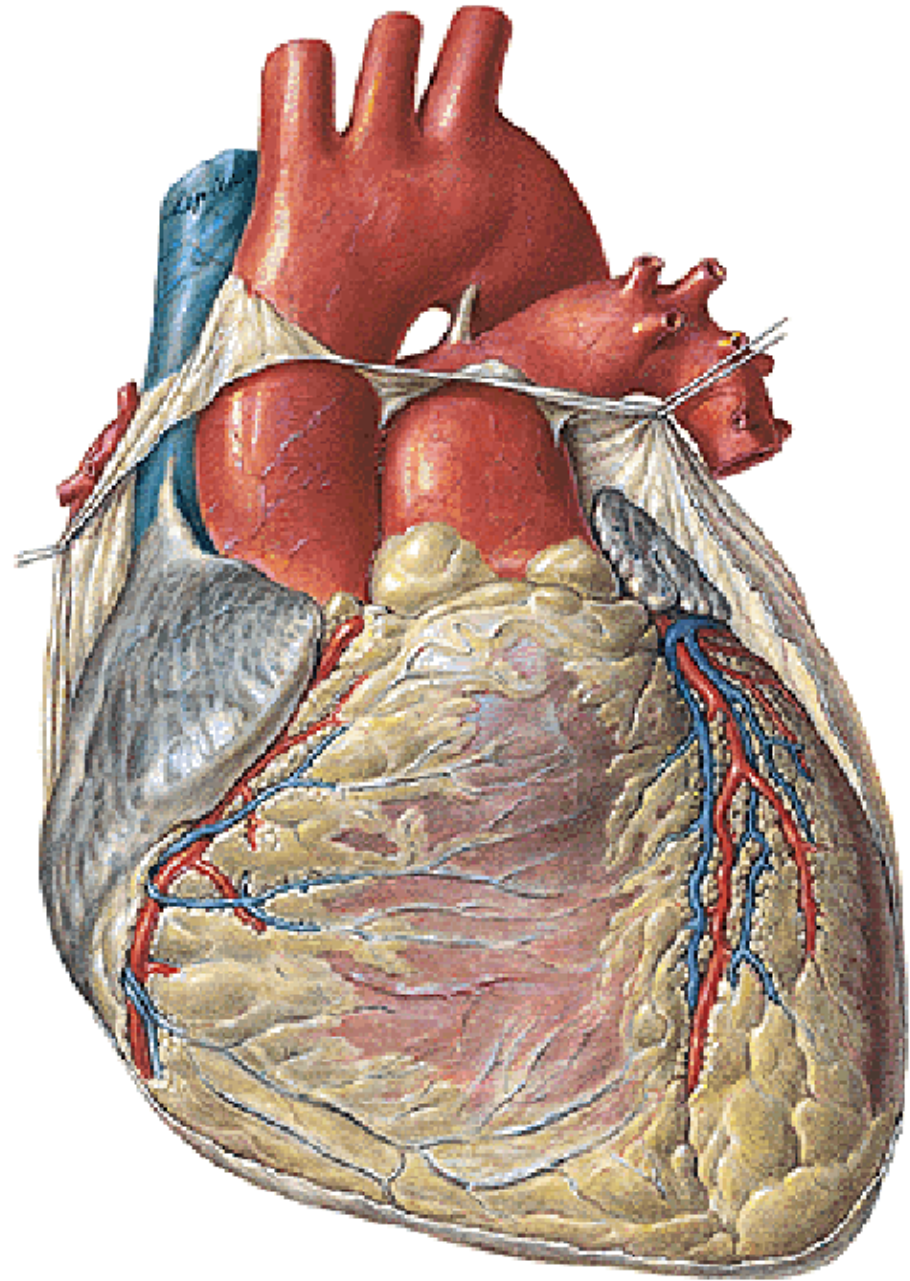
**Apex cordis**

**Facies sternocostalis (ant.)**

**Facies diaphragmatica (post.)**

**Margo acutus (dexter)**

**Margo obtusus (sinister)**  
**= facies pulmonalis**



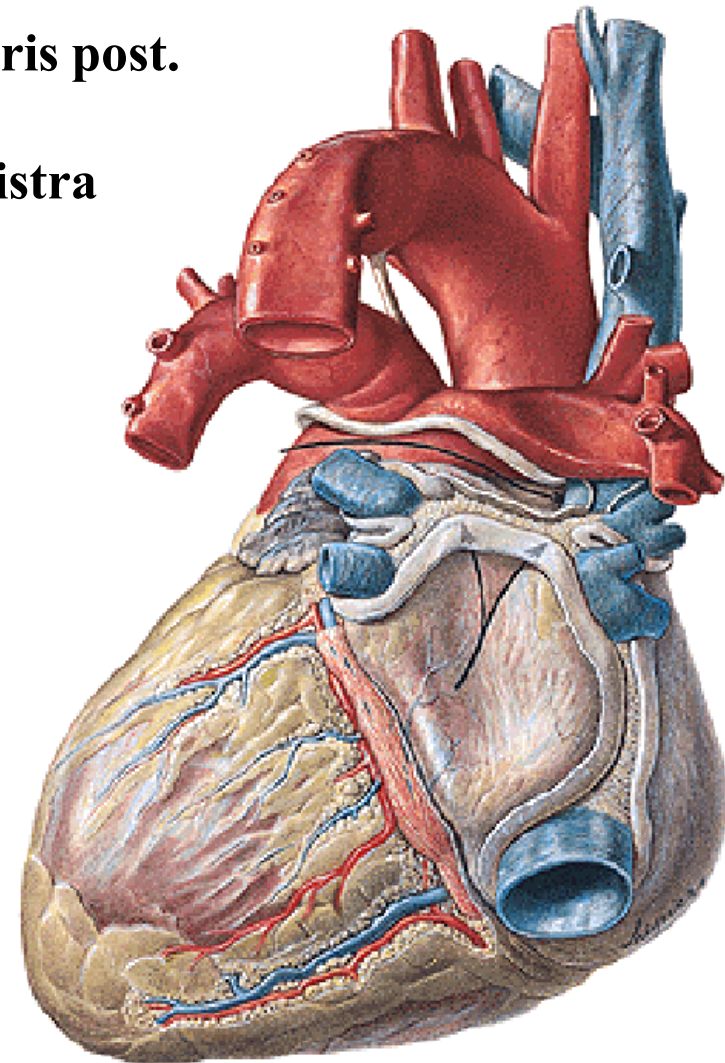
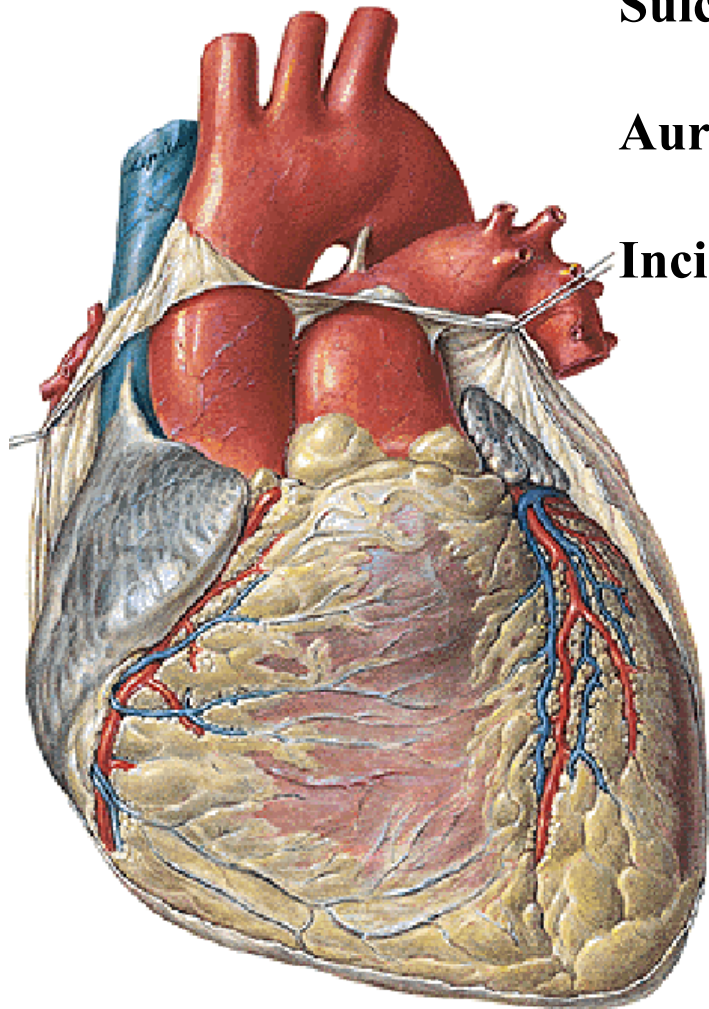
**Sulcus coronarius**

**Sulcus interventricularis ant.**

**Sulcus interventricularis post.**

**Auricula dextra et sinistra**

**Incisura apicis cordis**



## ROZDĚLENÍ SRDCE

**Septum cordis (interatriale, interventriculare)**

**Septum atrioventriculare dx., sin.**

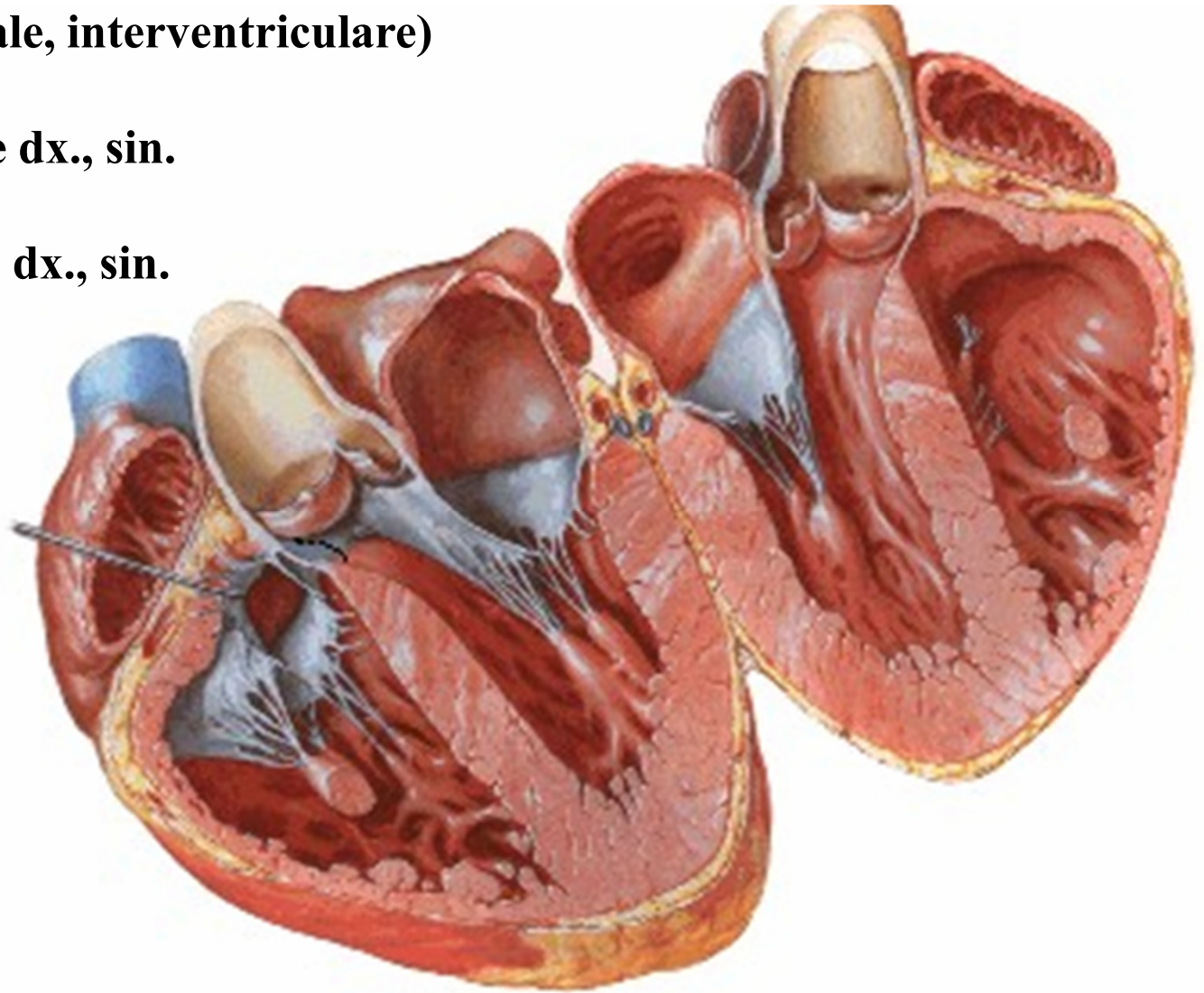
**Ostium atrioventriculare dx., sin.**

**Valva tricuspidalis**

**Valva bicuspidalis**

**Atrium dx. et sin.**

**Ventriculus dx. et sin.**

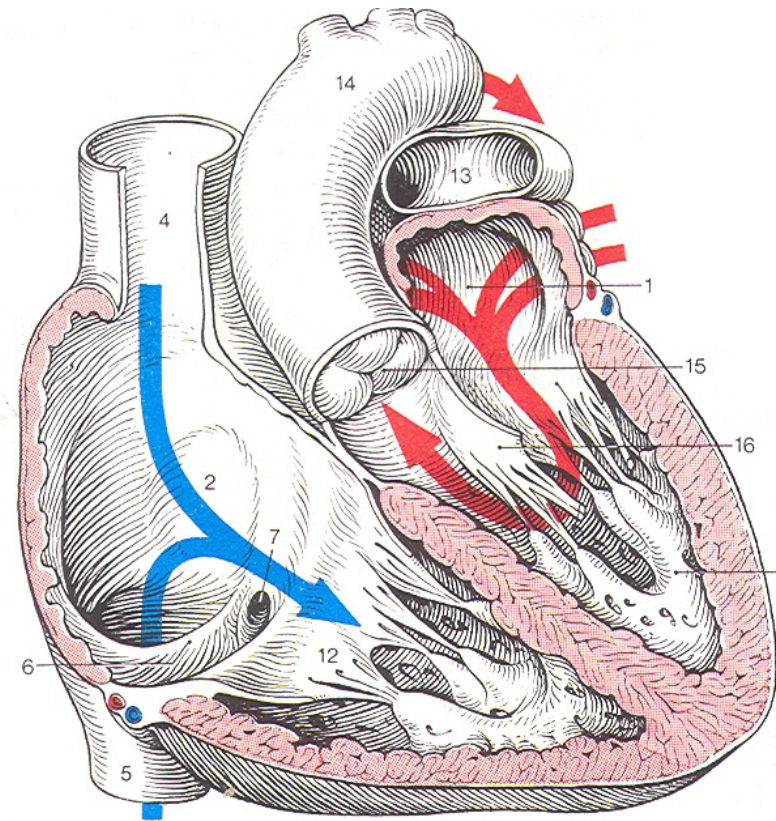
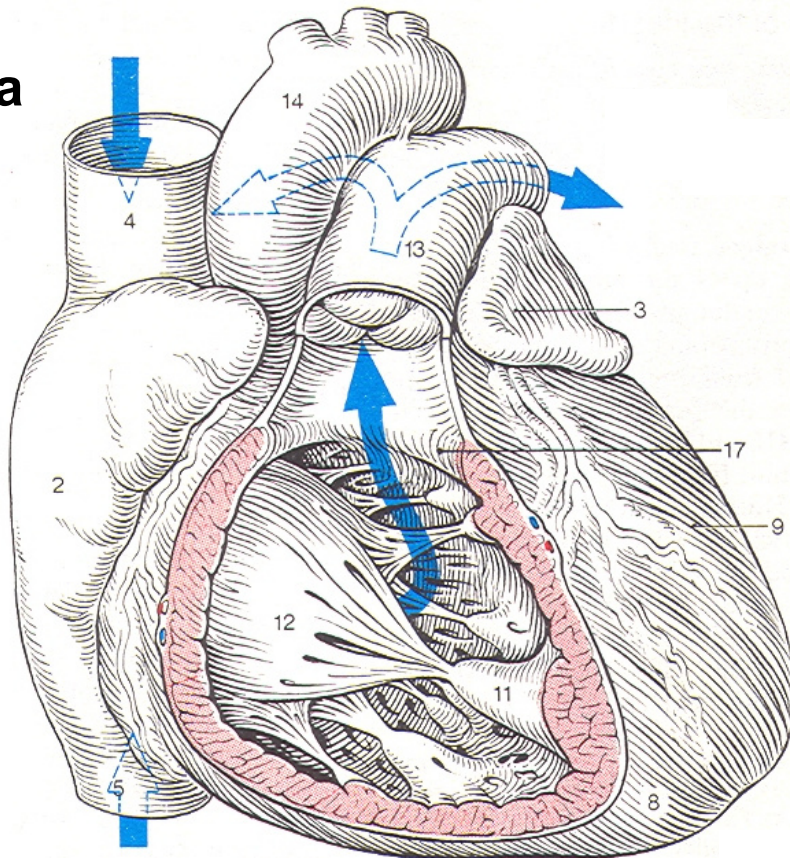


**Vena cava sup. et inf.**

**Truncus pulmonalis**

**Vv. pulmonales**

**Aorta**



## **ATRIUM DEXTRUM**

**Ostium v. cavae sup.**

**Ostium v. cavae inf.  
(valvula v. cavae inf.)**

**Ostium sinus coronarii  
(valvula sinus coronarii)**

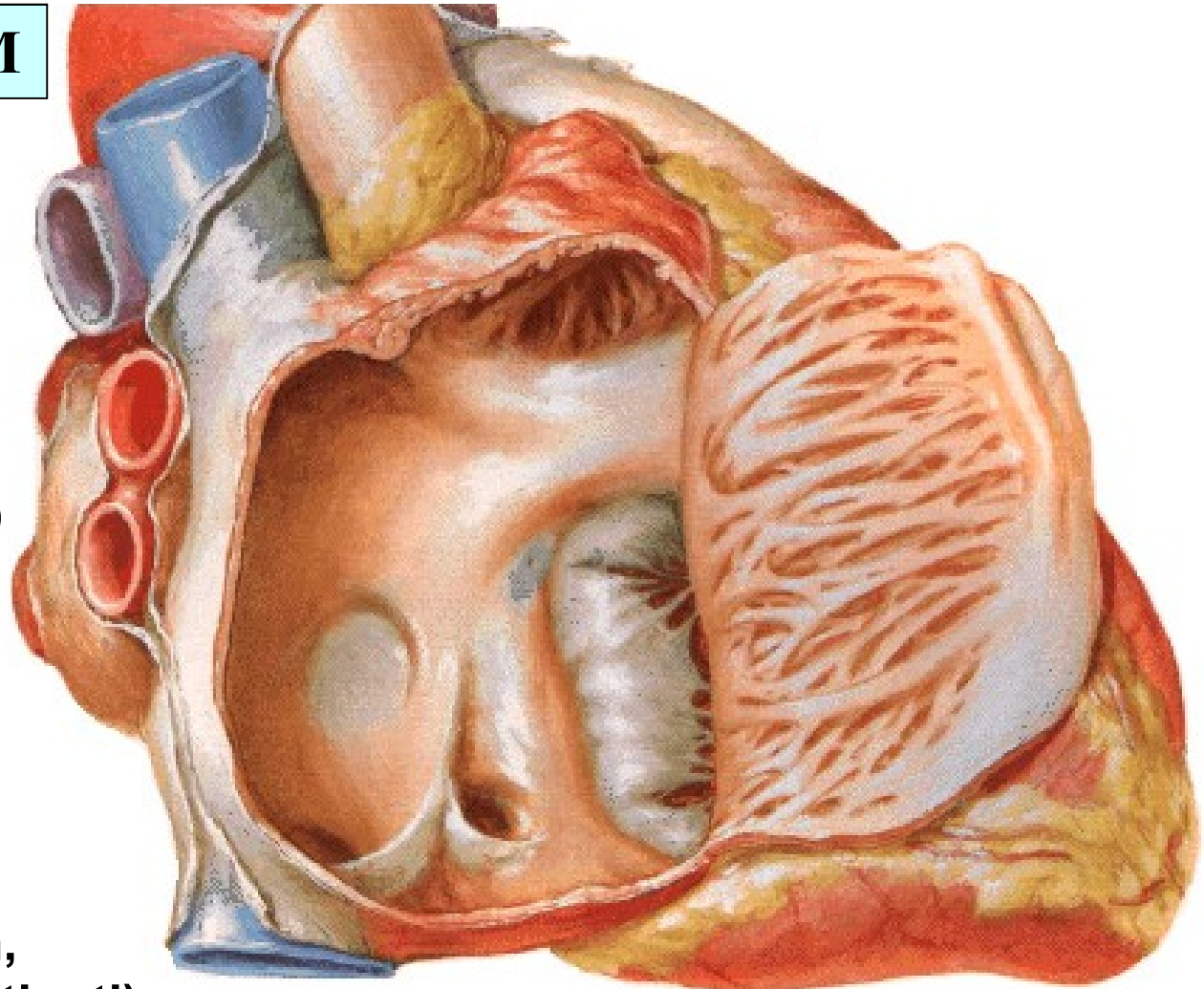
**Vv. cordis anteriores**

**Torus intervenosus**

**Crista terminalis  
(sinus venarum cavarum,  
auricula dextra, mm. pectinati)**

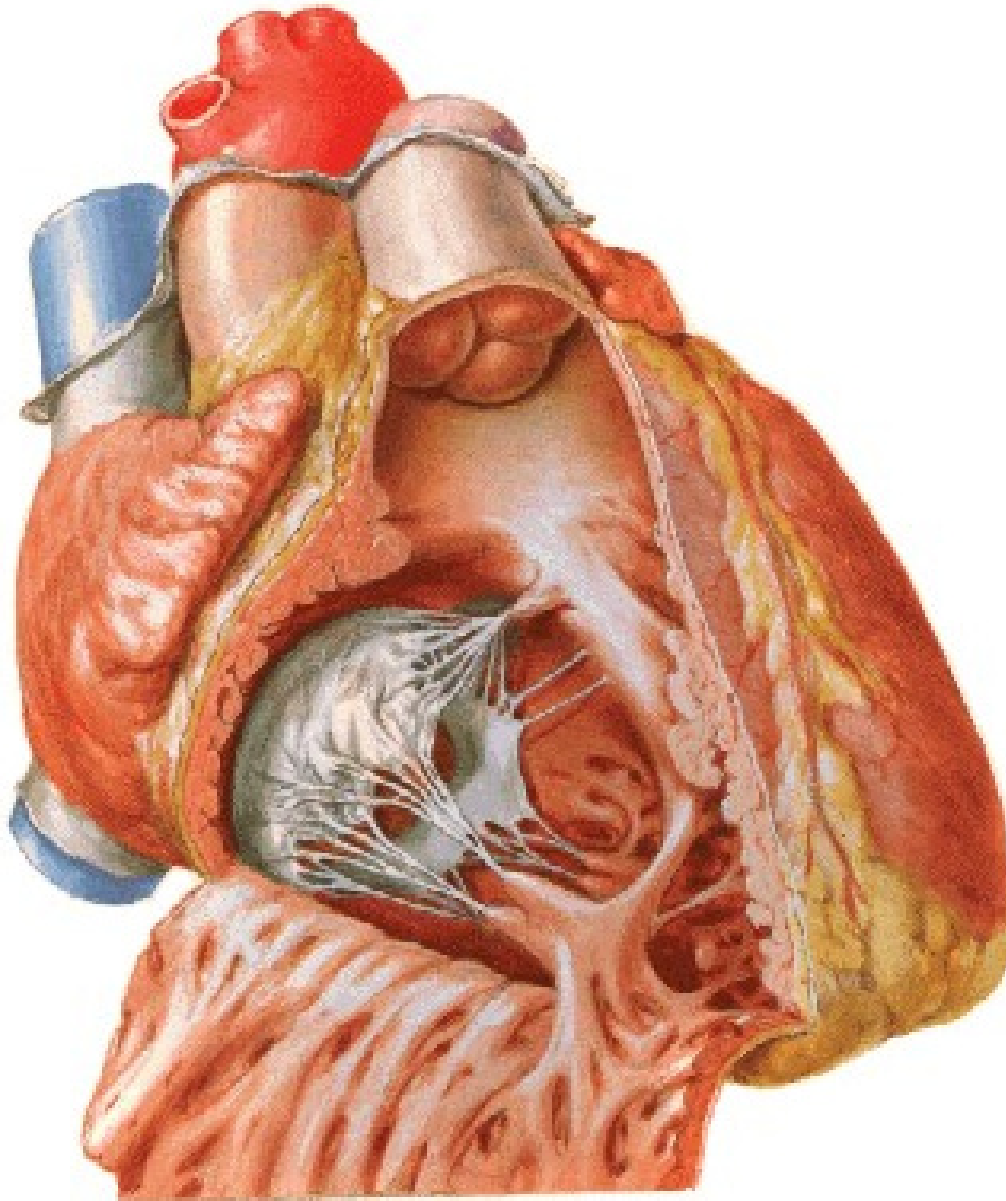
**Septum interatriale  
(fossa ovalis, limbus fossae ovalis)**

**Septum atrioventriculare dx.  
(ostium atrioventriculare dx.,  
valva tricuspidalis)**





# VENTRICULUS DEXTER



**Pars trabecularis**

**Pars glabra**

**Crista supraventricularis**

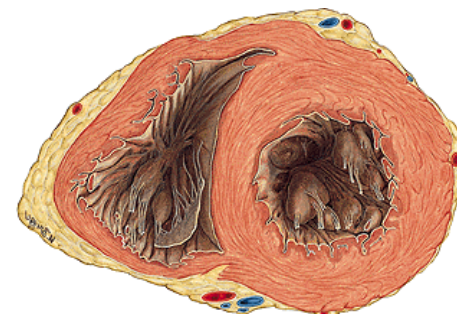
**Ostium atrioventriculare dextrum**

**Valva tricuspidalis**

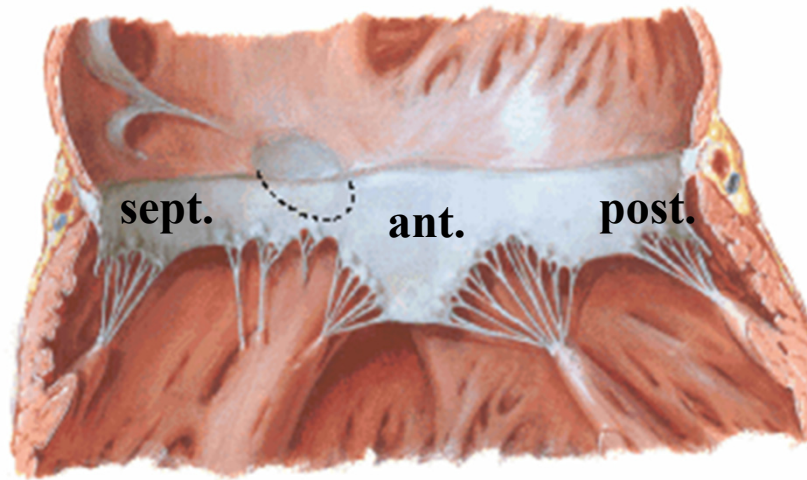
**Trabeculae carnae**

**Trabecula septomarginalis**

**Musculi papillares**



# VALVA TRICUSPIDALIS



**Cuspis anterior, septalis, posterior**

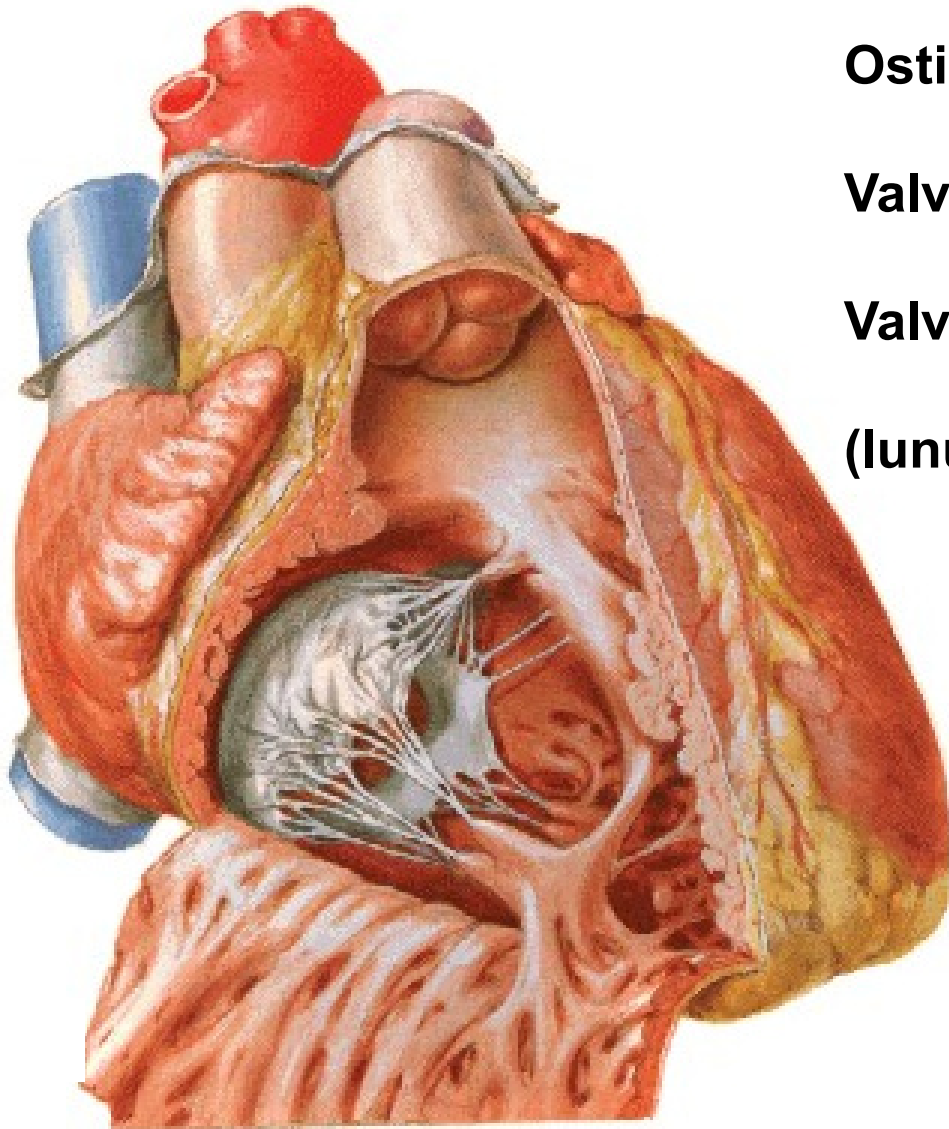
**Chordae tendineae**

**Musculi papillares**

**anterior, parvi - posterior, septales**



# VENTRICULUS DEXTER



**Pars glabra (conus arteriosus)**

**Ostium trunci pulmonalis**

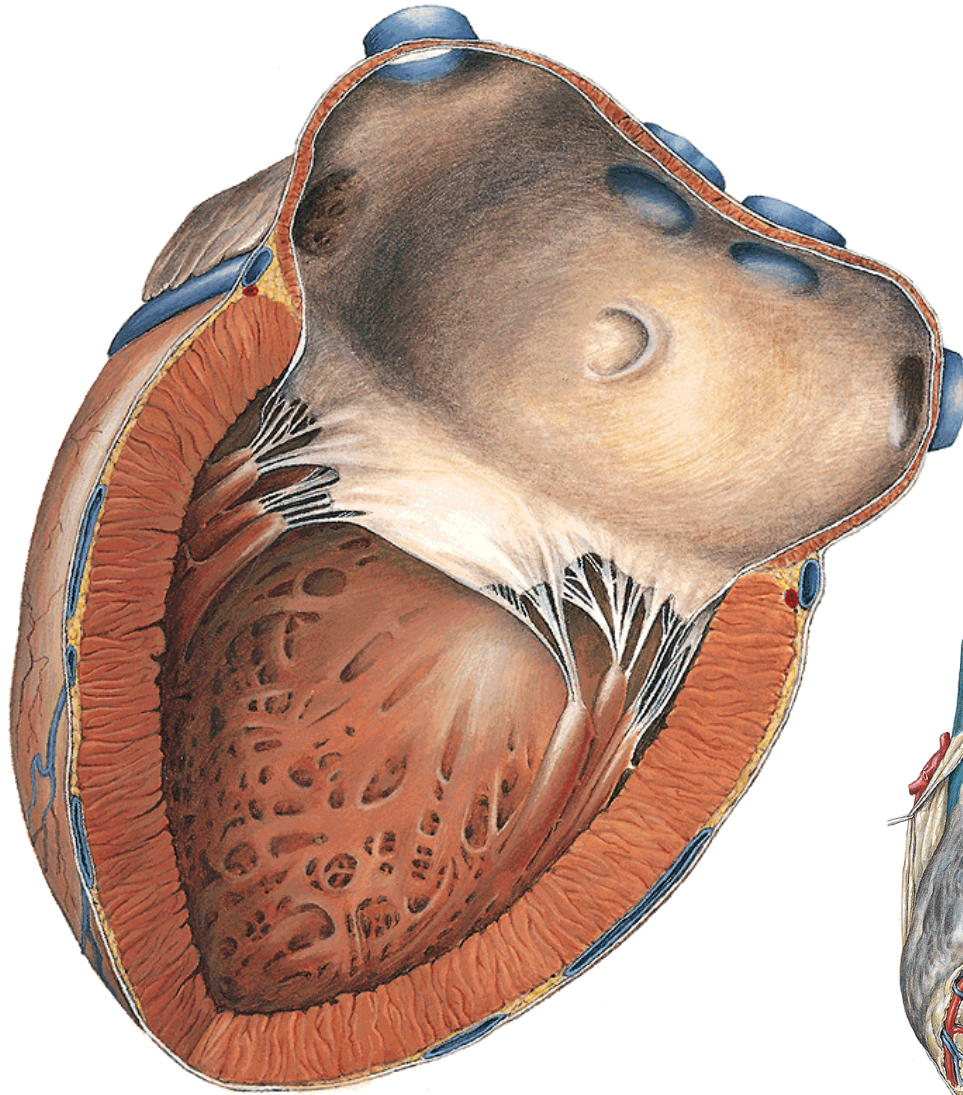
**Valva trunci pulmonalis**

**Valvula semilunaris ant., dx., sin.**

**(lunula, nodulus, sinus tr. pulmonalis)**



# ATRIUM SINISTRUM

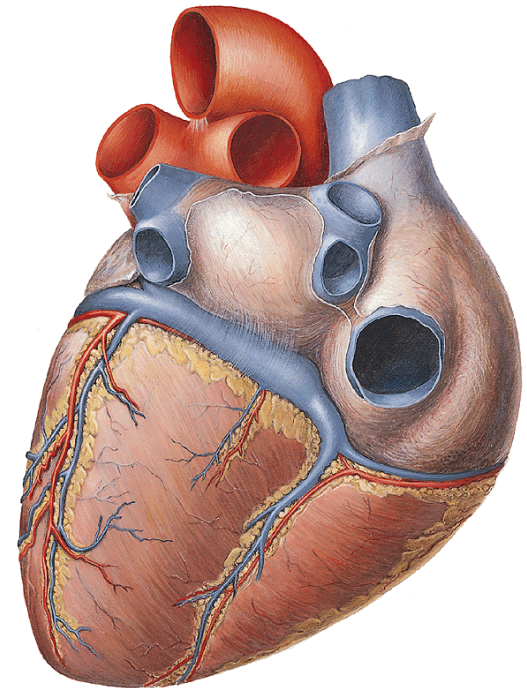
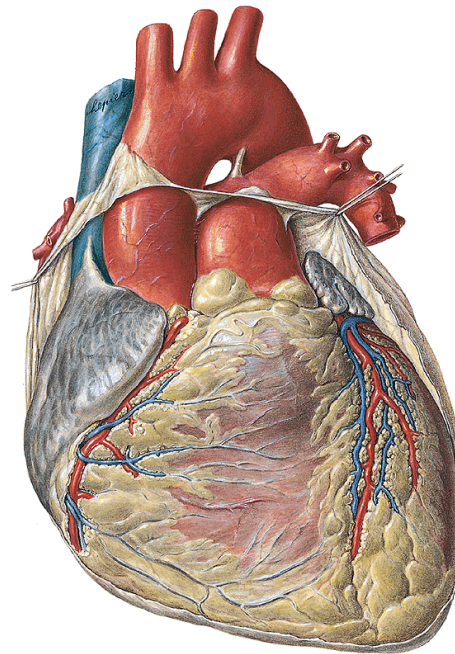


**Auricula sinistra (musculi pectinati)**

**Ostia venarum pulmonalium**

**Septum interatriale  
(fossa ovalis, falx septi)**

**Ostium atrioventriculare sin.  
(valva bicuspidalis)**



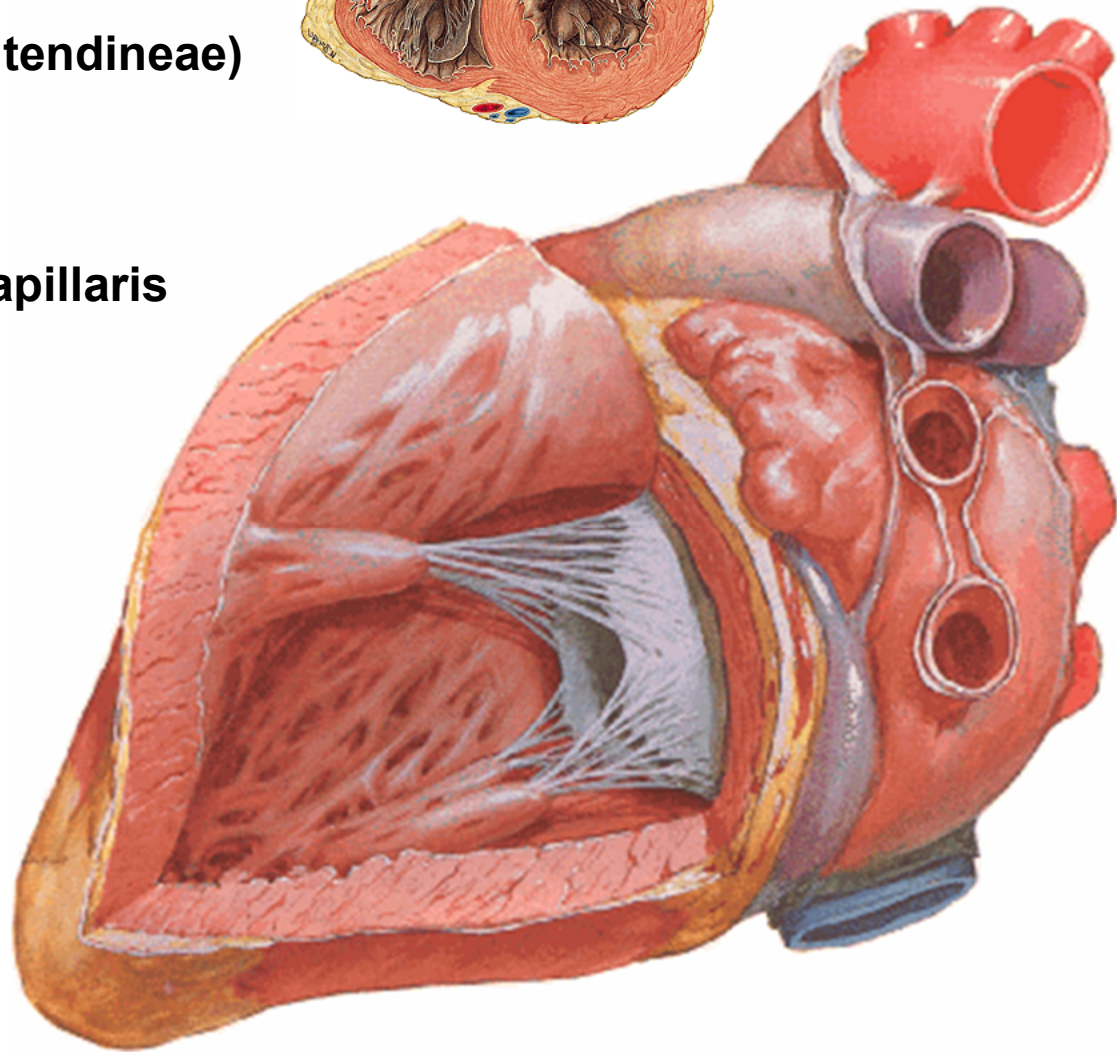
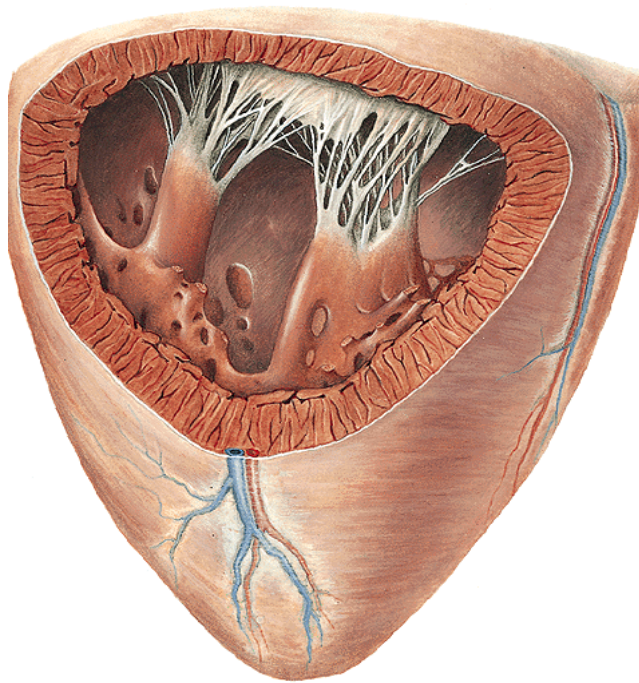
# VENTRICULUS SINISTER

**Ostium atrioventriculare sin.**

**Valva bicuspidalis - mitralis  
(cuspis ant. et post., chordae tendineae)**

**M. papillaris ant. et post.**

**Pars suprapapillaris et infrapapillaris**



**Ostium aortae**

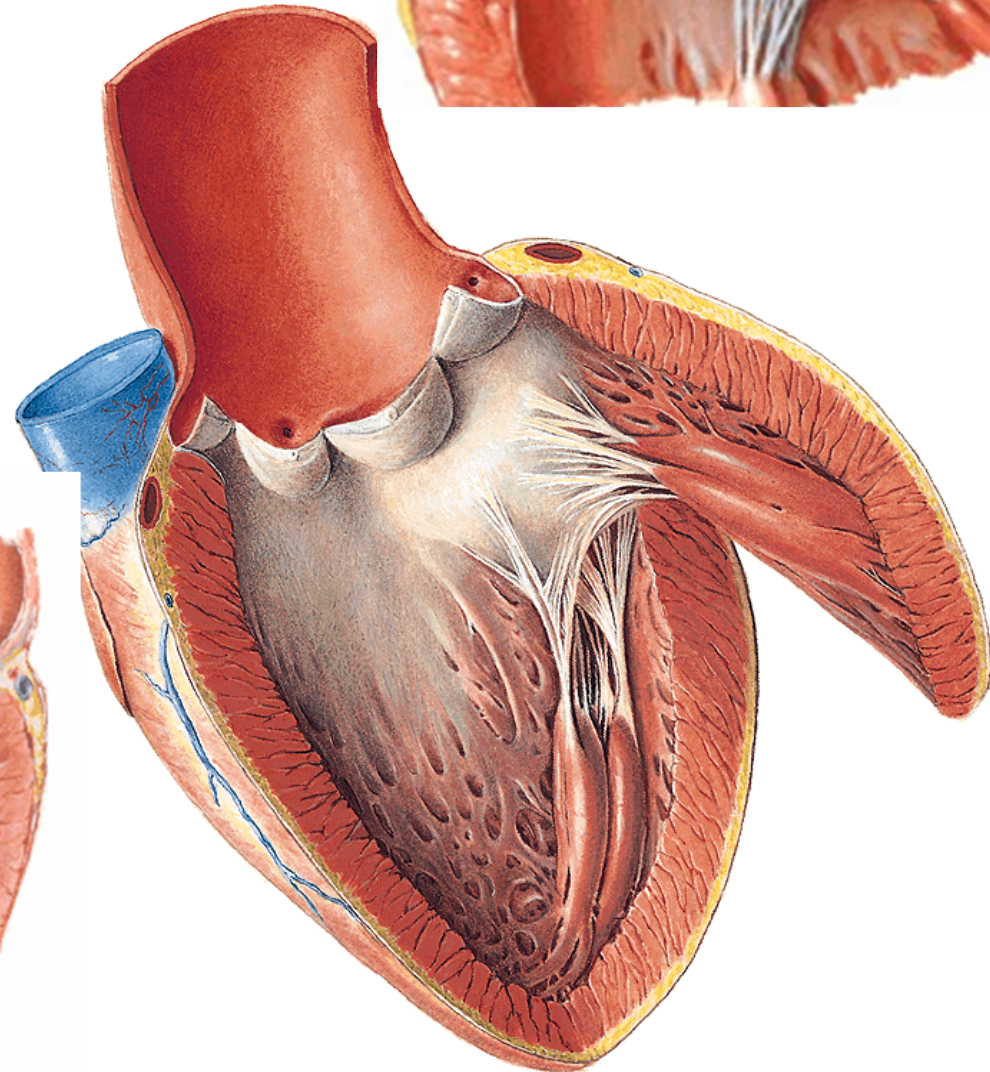
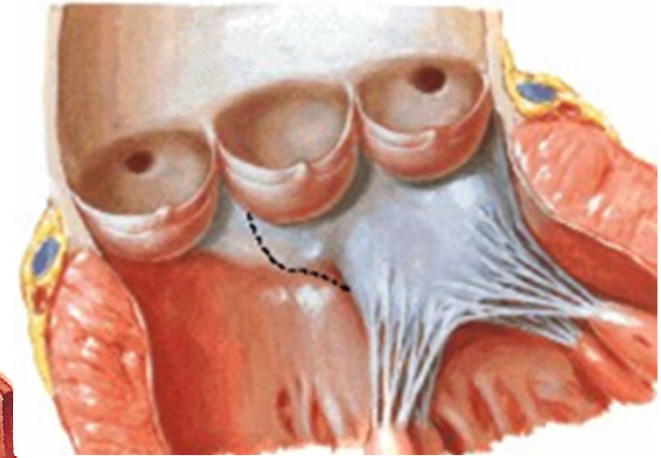
**Valva aortae (bulbus aortae)**

**Valvula semilunaris post., dx., sin.**

**Nodulus, lunula, sinus aortae**

**Sinus aortae dx.  
(a. coronaria cordis dx.)**

**Sinus aortae sin.  
(a. coronaria cordis sin.)**



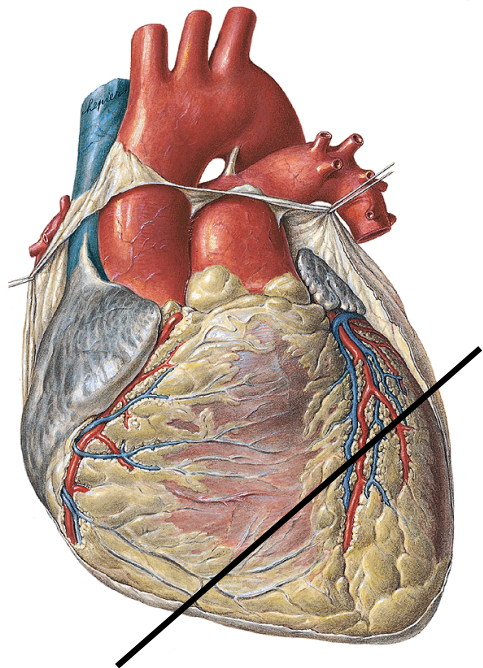
# STAVBA SRDCE

**ENDOCARDIUM (nitroblána srdeční)**

**MYOCARDIUM (svalovina srdeční, převodní systém srdeční)**

**EPICARDIUM (pericardium serosum - lamina visceralis )**

**PERICARDIUM (fibrosum et serosum – lamina parietalis)**



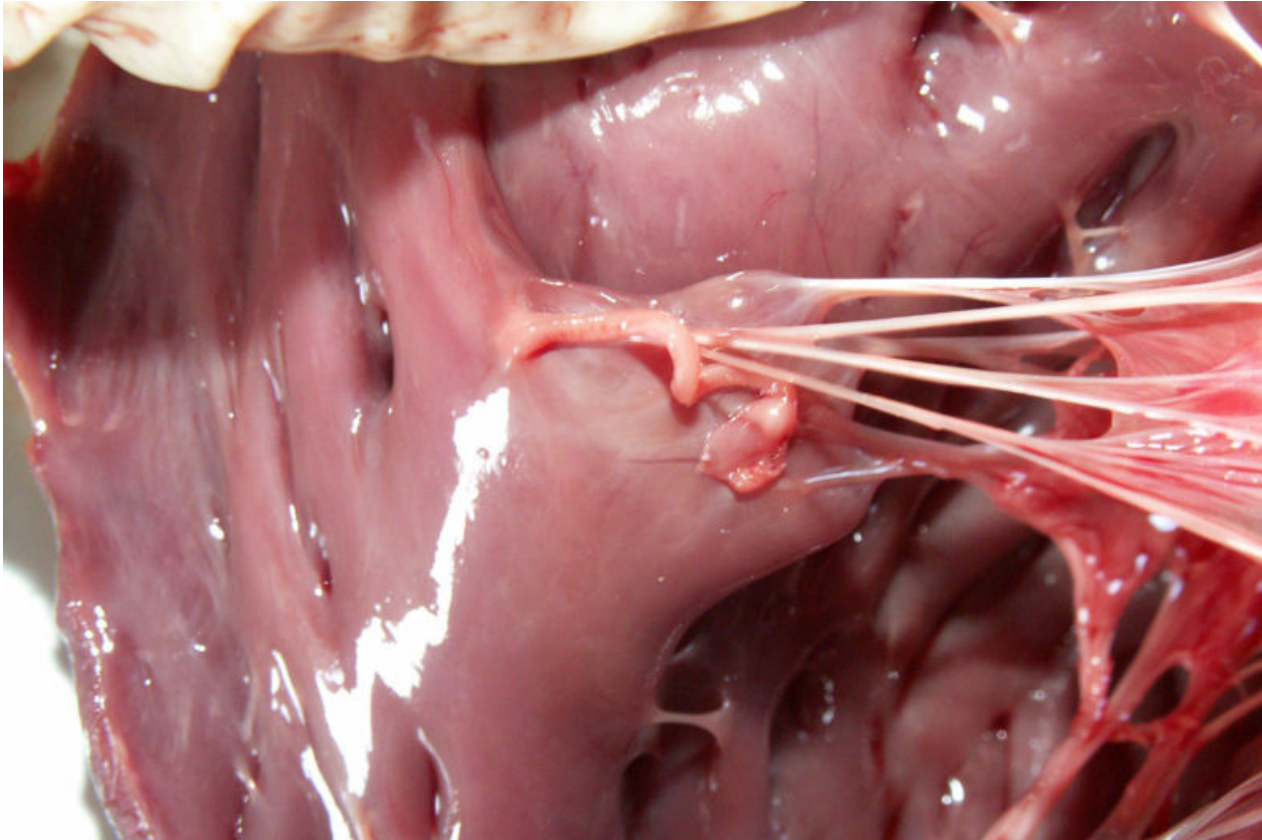
## **ENDOCARDIUM**

**silnější v předsíních než v komorách**

**silnější v levé části srdce**

**výběžky endokardu - podkladem chlopní**

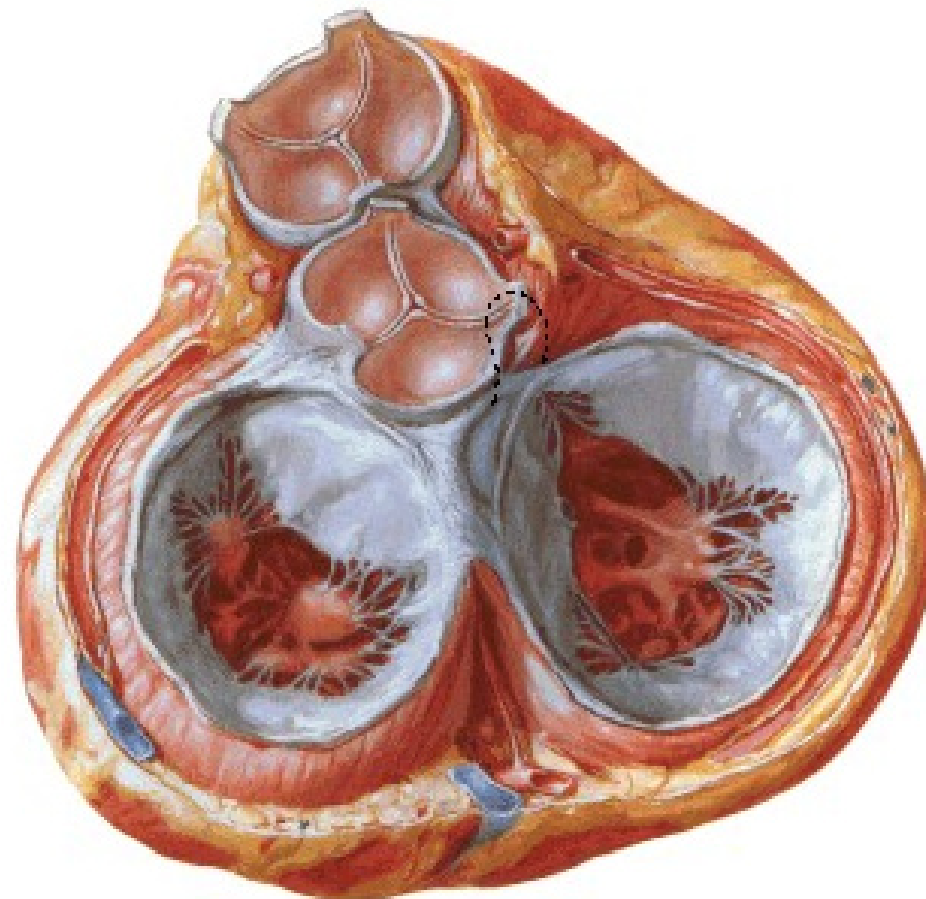
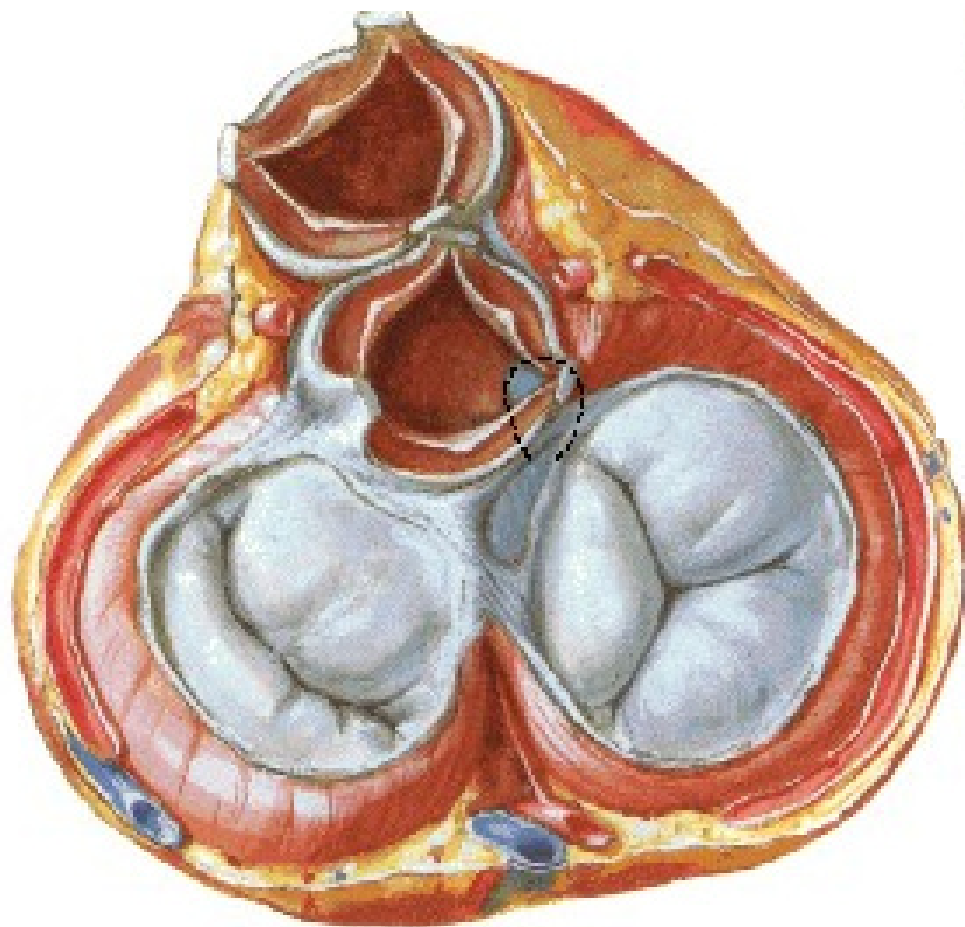
**(laminae fibrosae)**





# SRDEČNÍ CHLOPNĚ

**SYSTOLA**



**DIASTOLA**

## SRDEČNÍ SKELET



**odděluje myokard předsíní od  
myokardu komor !!!!!**

**Anulus fibrosus dexter**

**Anulus fibrosus sinister**

**Anulus aorticus**

**Anulus trunci pulmonalis**

**Konusová šlacha**

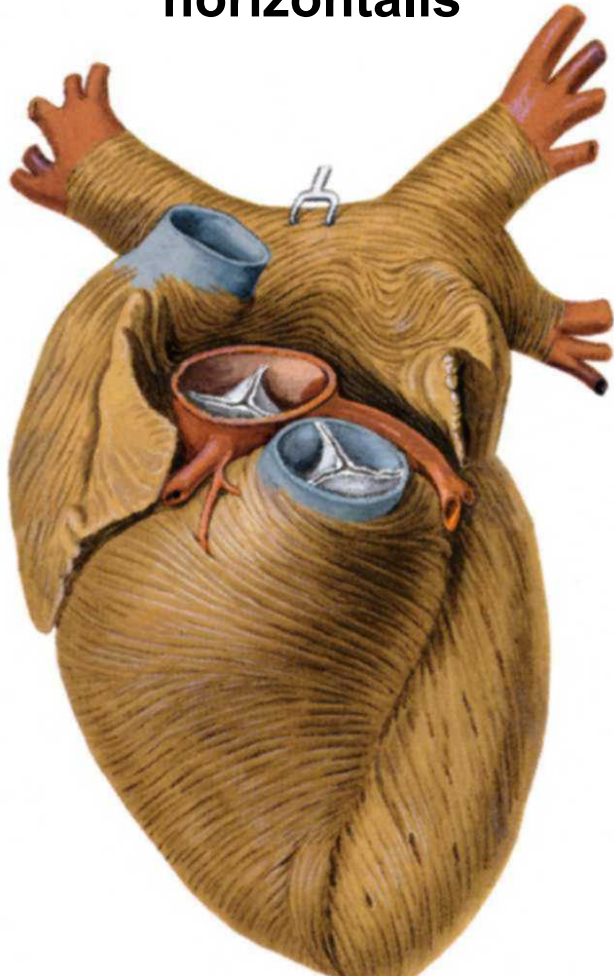
**Trigonum fibrosum dextrum**

**Trigonum fibrosum sinistrum**

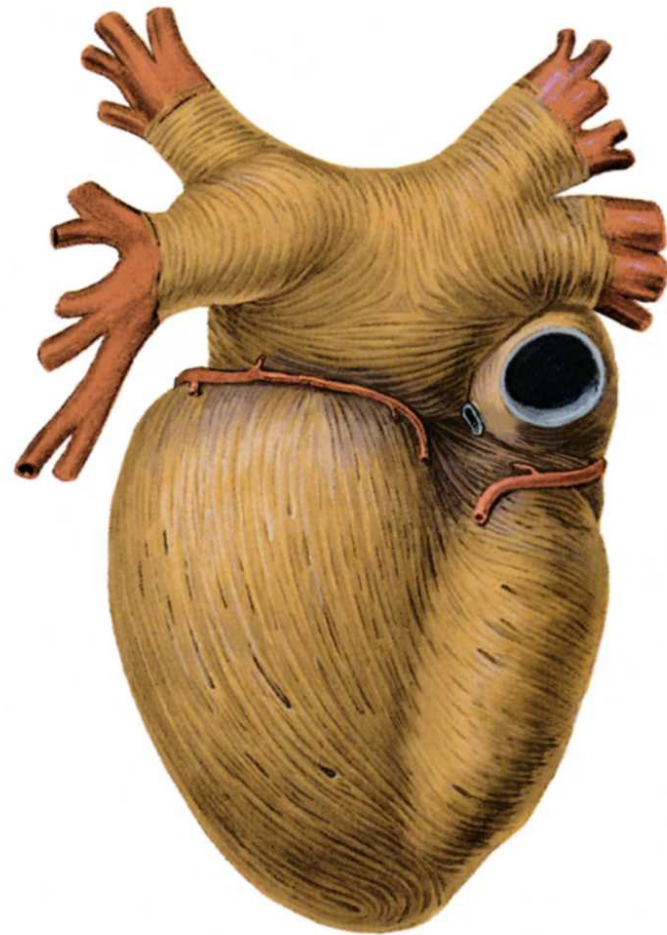
**Pars membranacea septi cordis**

# MYOKARD PŘEDSÍŇÍ – povrchová vrstva

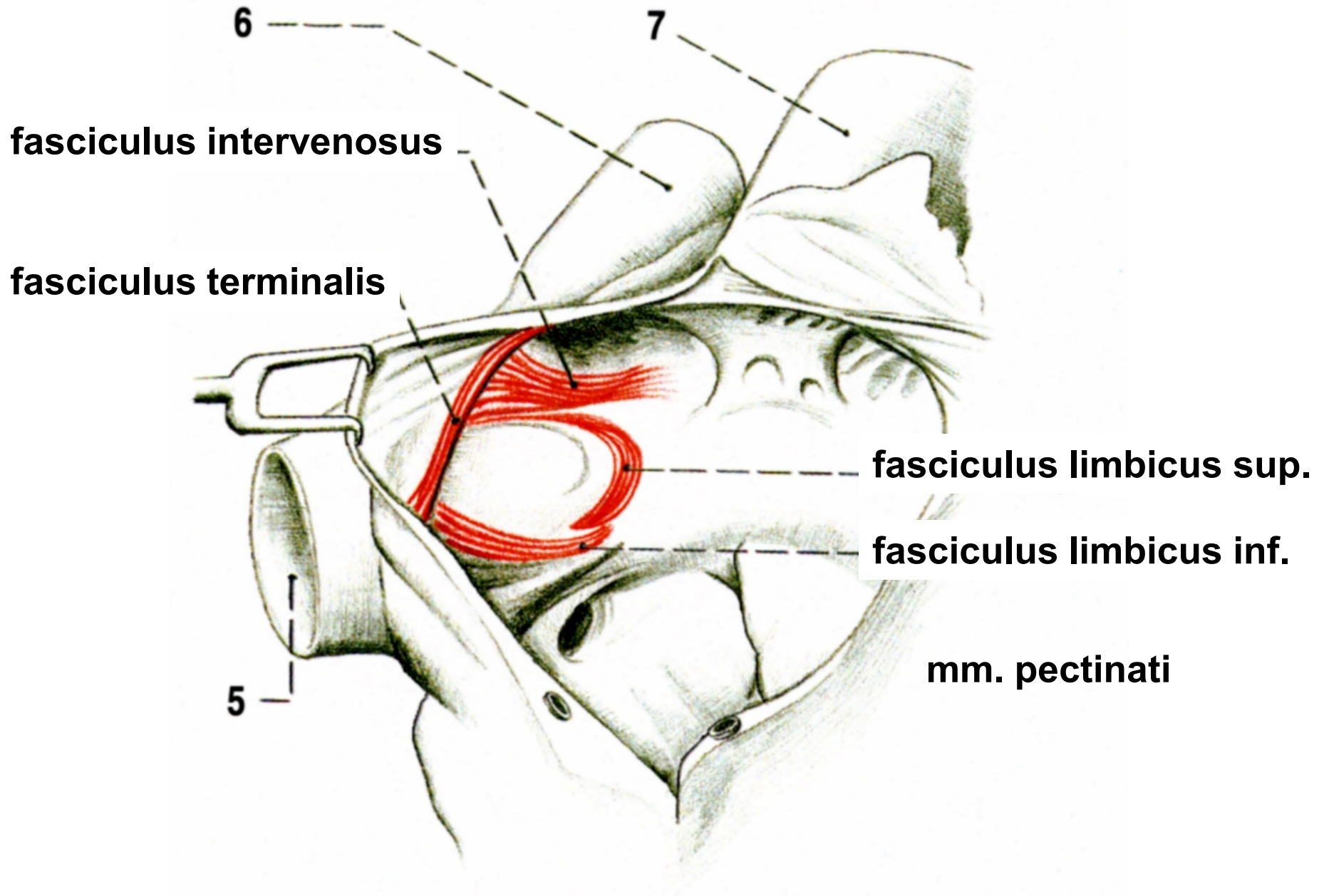
**fasciculus interauricularis  
horizontalis**



**fasciculus interauricularis  
verticalis**



# MYOKARD PŘEDSÍNÍ – hluboká vrstva



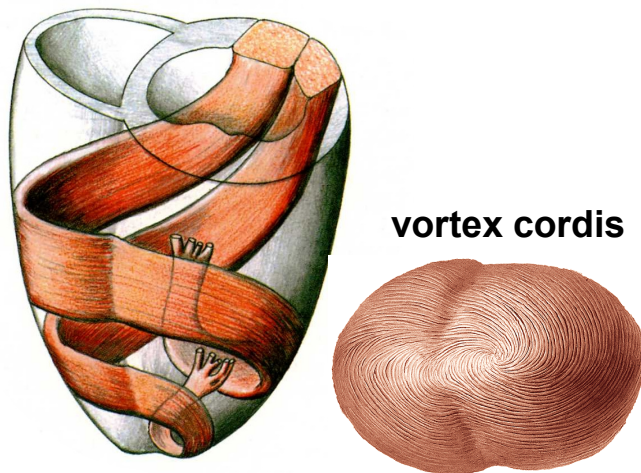
## MYOKARD KOMOR

Ventriculus sin. – 3x silnější stěnu

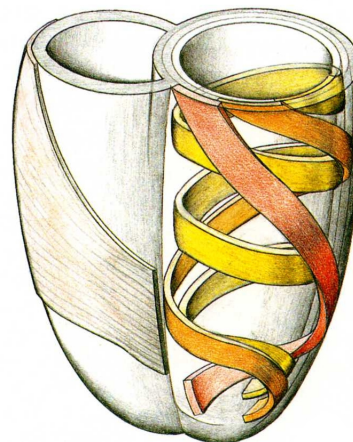
Ventriculus dx. – slabší

### Vrstvy:

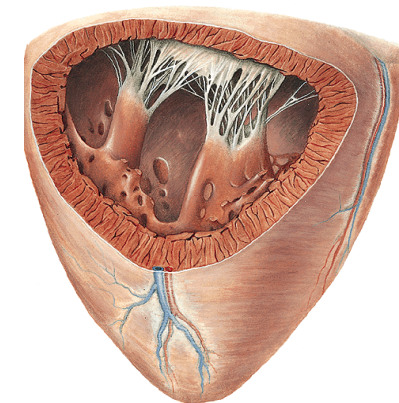
1. povrchová (obě komory, levotočivý šroub)
2. střední (každá komora zvlášť, cirkulární)
3. hluboká (trabeculae, mm. papillares, síť)ci



povrchová vrstva

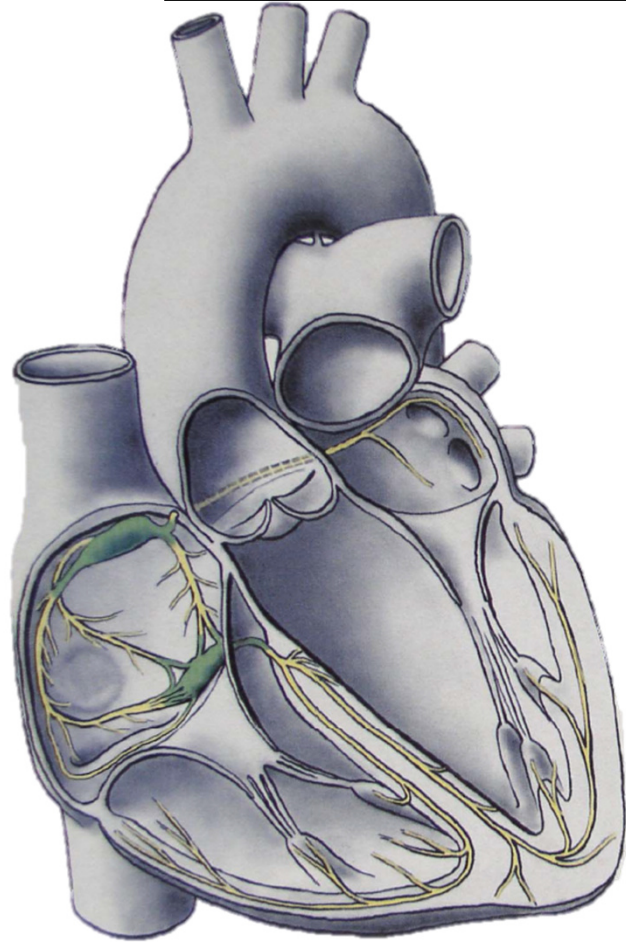


střední vrstva



hluboká vrstva

## PŘEVODNÍ SYSTÉM SRDEČNÍ (excitomorický aparát)



### 1. **Nodus sinuatrialis** (Keit Flackův sinusový uzlík)

Internodální spoje (přední, střední, zadní)

Interatriální spoj (Bachmanův svazek)

### 2. **Nodus atrioventricularis**

(předsíňokomorový uzlík, Ashoff-Tawarův)

### 3. **Fasciculus atrioventricularis**

(Gaskell-Hissův můstek)

### 4. **Crus dextrum, crus sinistrum**

### 5. **Rami subendocardiales** (Purkyňova vlákna)

#### **Přídavné spoje:**

by pass tractus (přes bázi cuspis septalis do fasciculus atrioventricularis),

Mahaimova paraspecifická vlákna rozvlákněný fasciculus fasciculus atrioventricularis)

Kentova vlákna (cirkulární mezi předsíněmi a komorami)

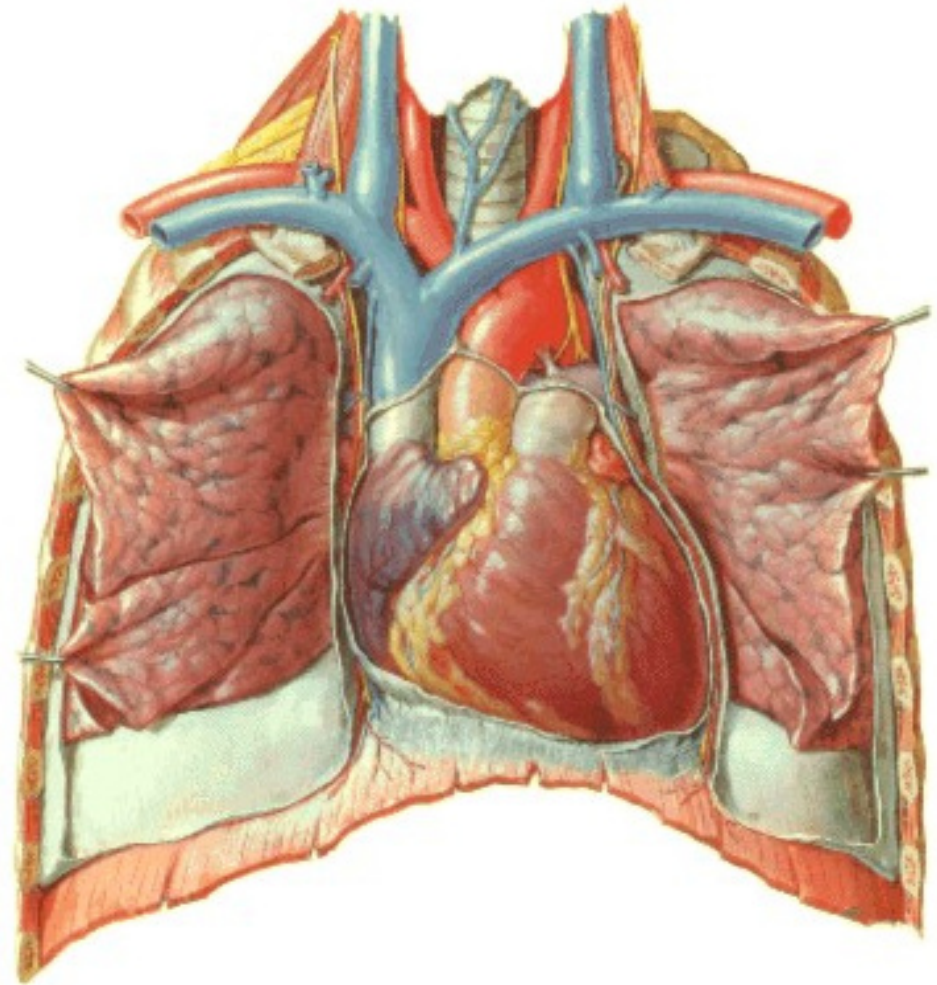
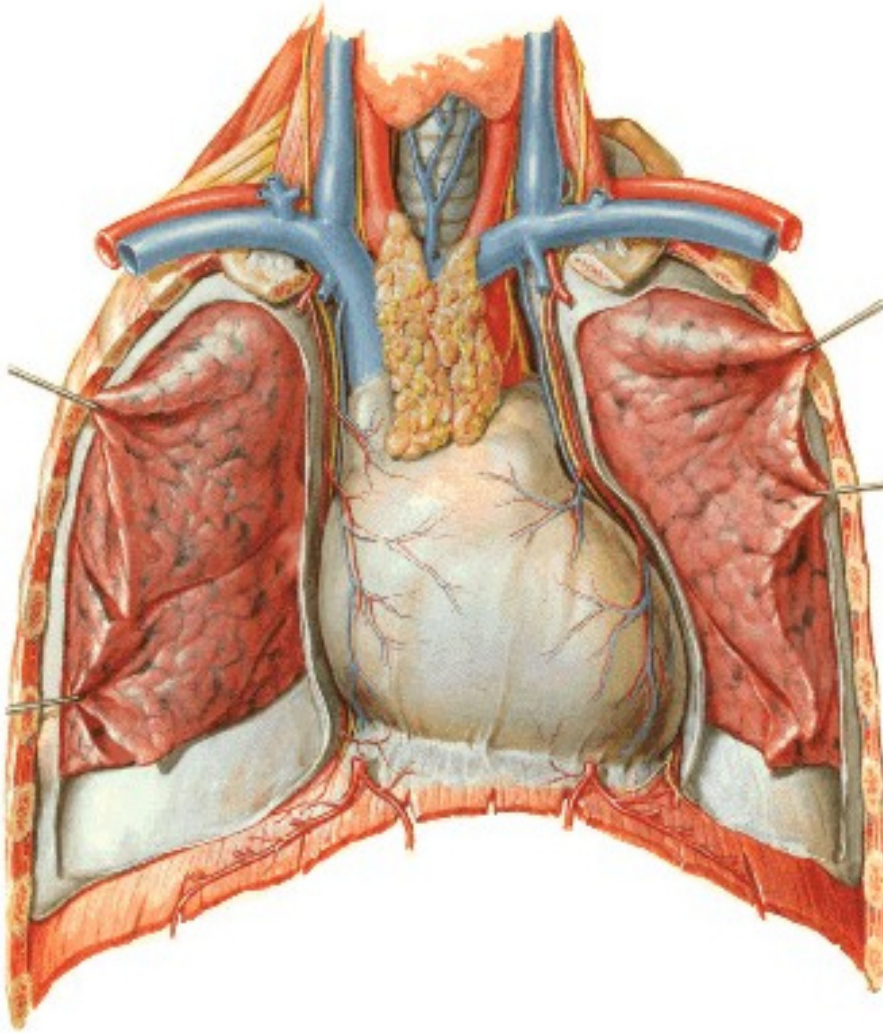
# PERICARDIUM

**Pericardium fibrosum**

**lamina parietalis**

**Pericardium serosum**

**lamina visceralis (epicardium)**



## PERICARDIUM

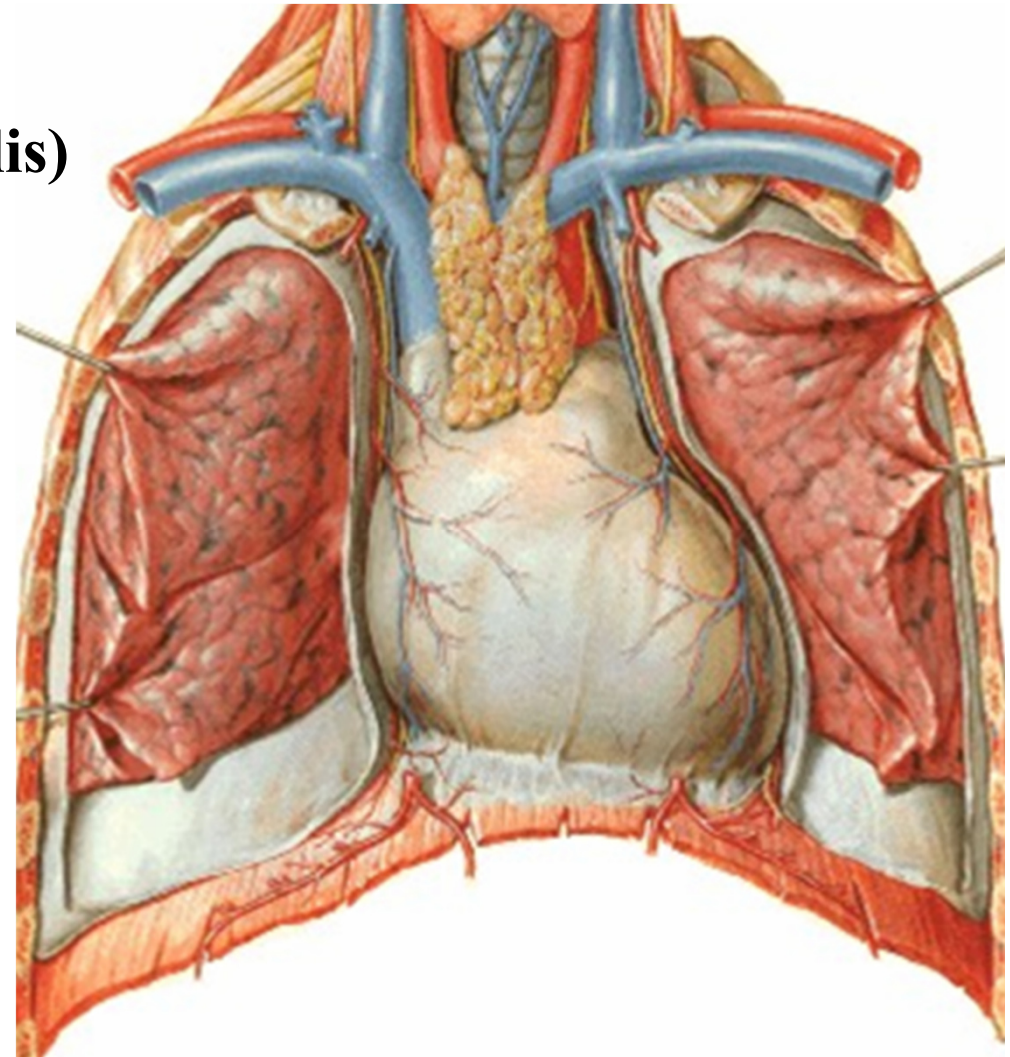
**Basis pericardii - facies diaphragmatica  
(ligg. phrenicopericardiaca)**

**Cupula pericardii  
(aorta, v. cava sup., tr. pulmonalis)**

**Pars sternalis  
(ligg. sternopericardiaca)**

**Partes laterales  
(vasa pericardiophrenica,  
n. phrenicus)**

**Pars dorsalis**

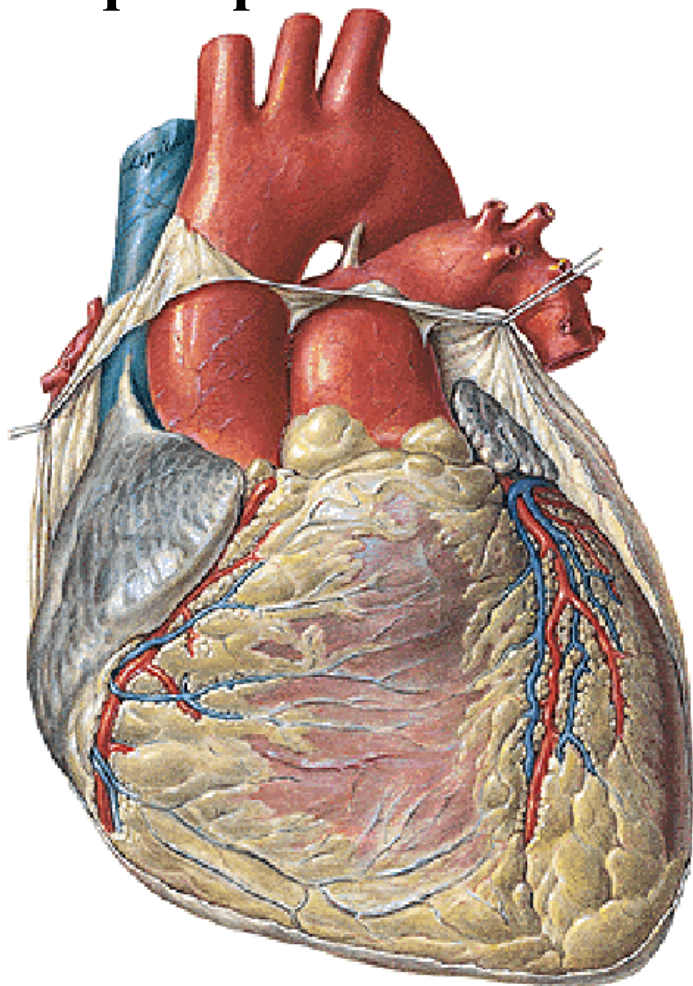




# PERICARDIUM

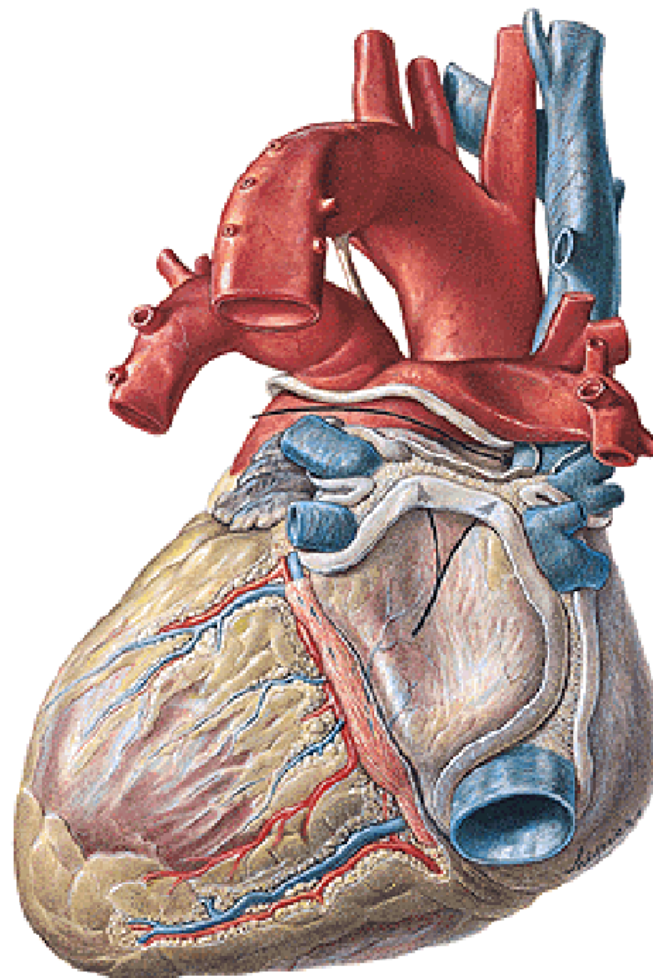
**Cavum pericardii**

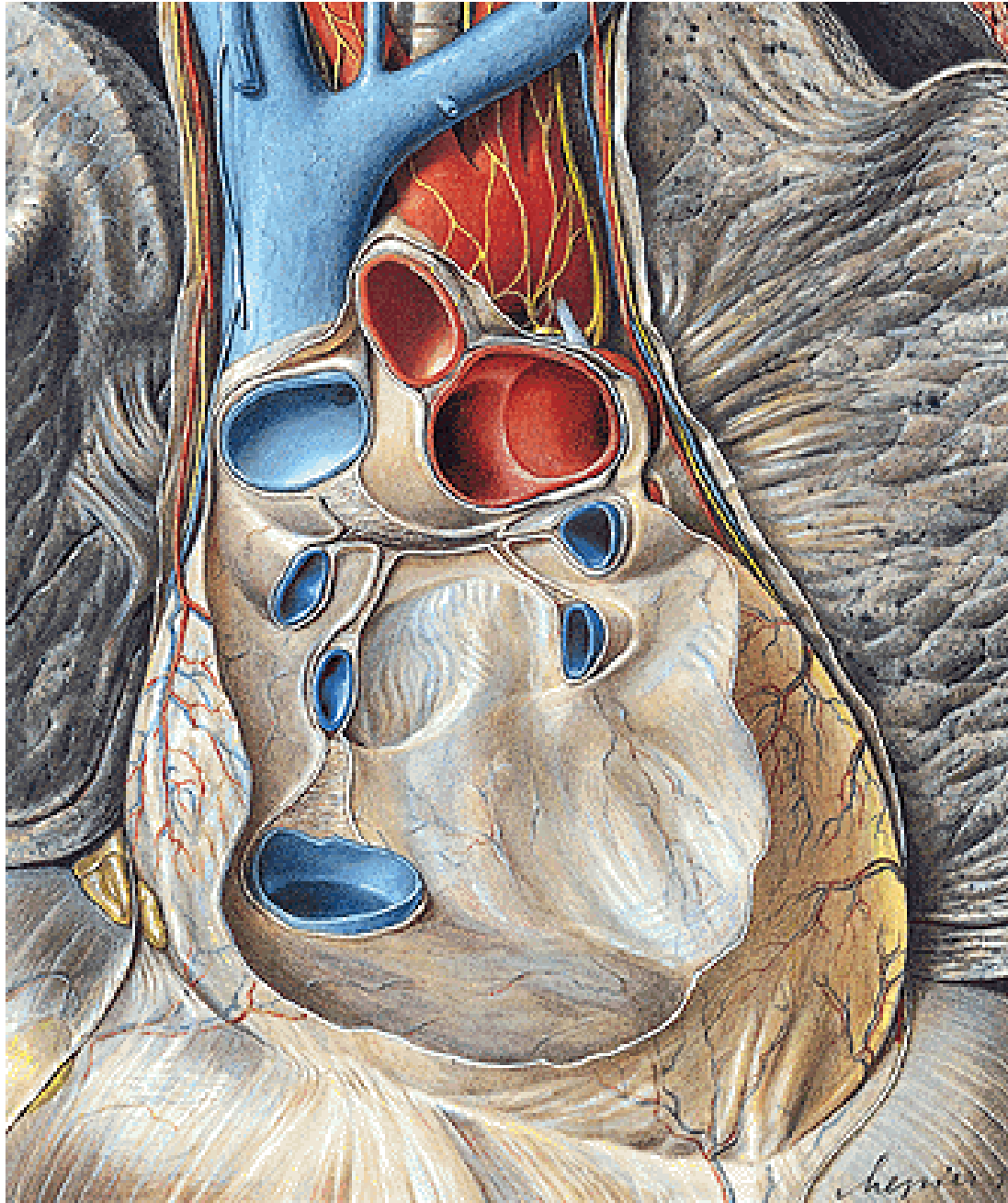
**Liquor pericardii**



**Epicardium**

**Subepikardiální vazivo**





**Porta arteriarum =  
vagina serosa arteriarum**

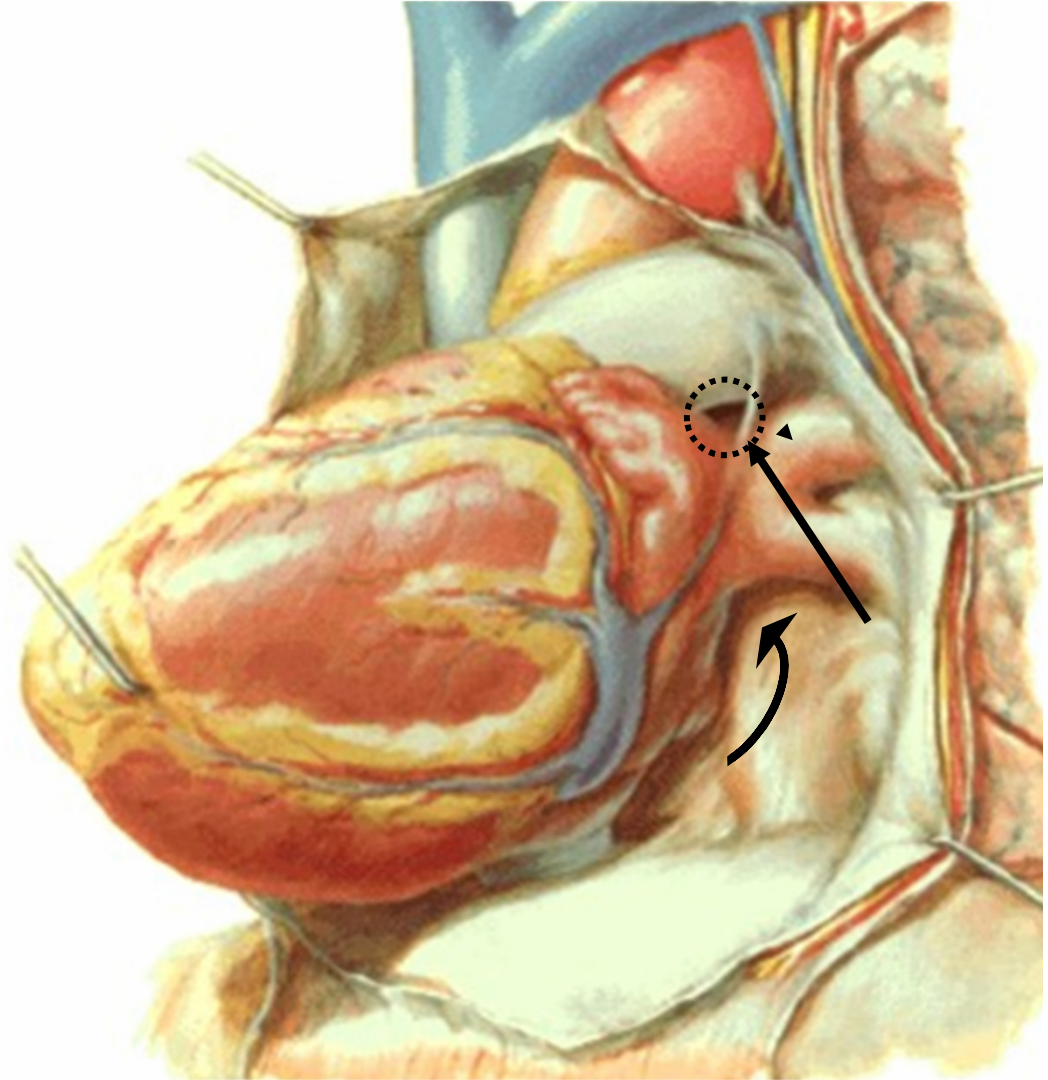
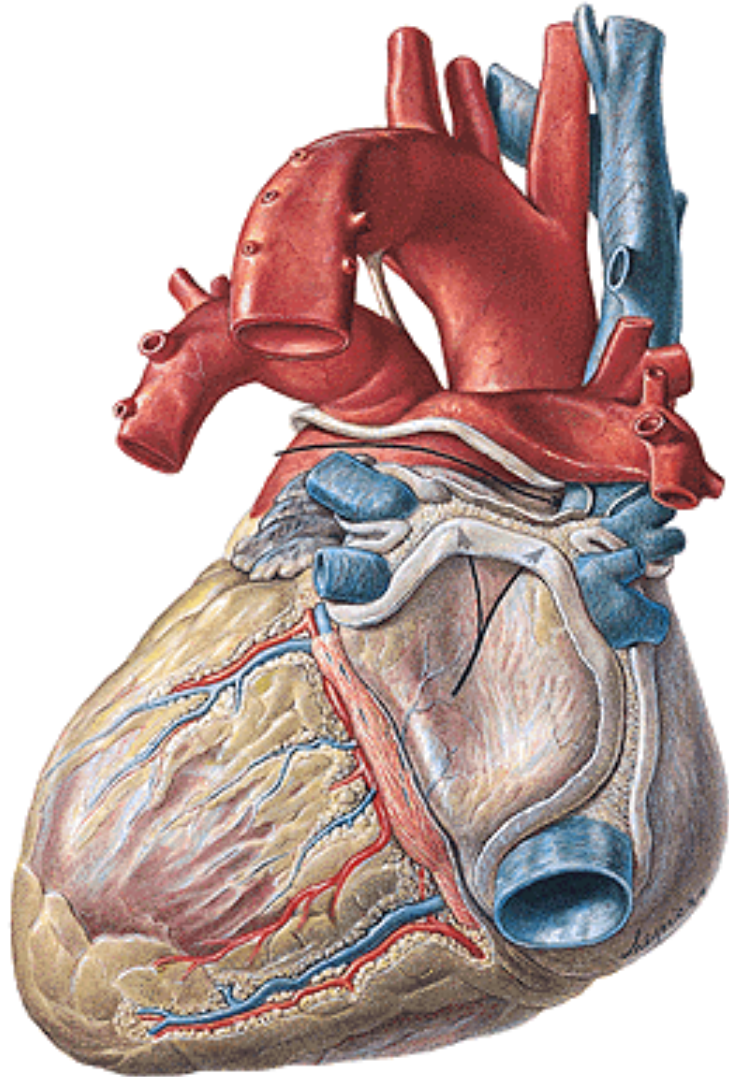
**(aorta, tr.pulmonalis)**

**Porta venarum  
(vv.cavae, vv.pulmonales)**

**sinus transversus pericardii**

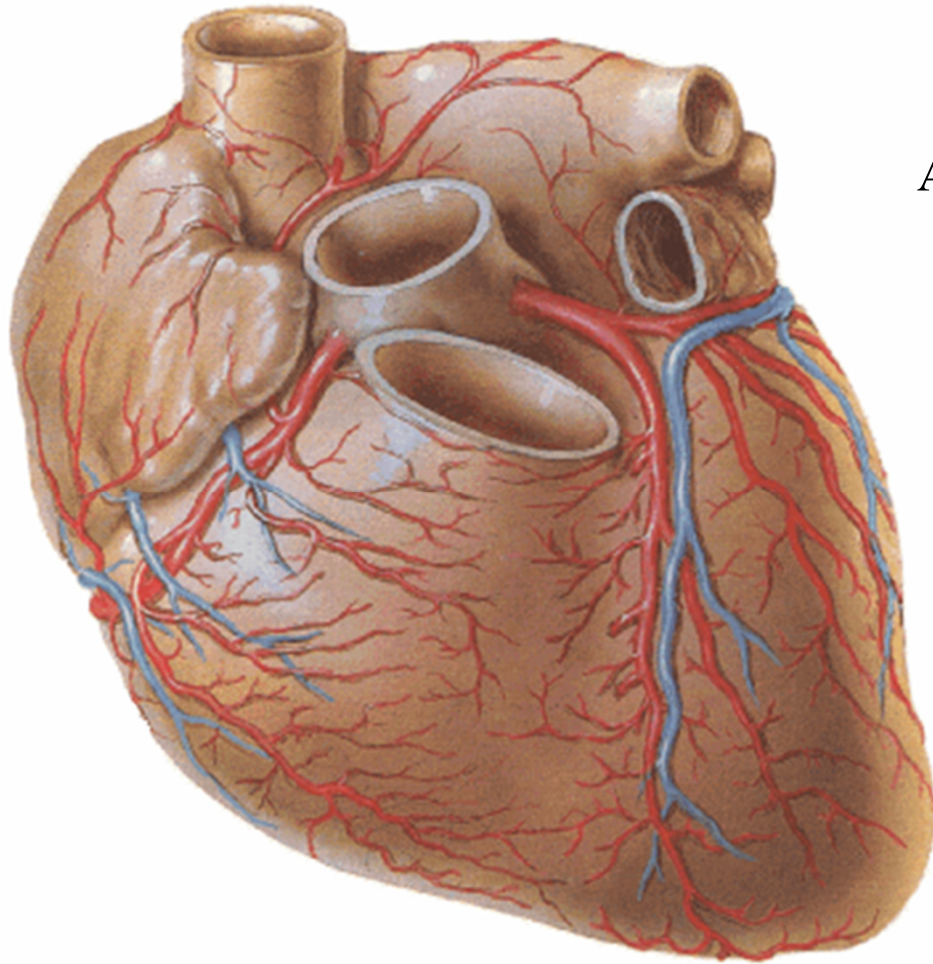
**sinus obliquus pericardii**

# Sinus transversus pericardii et sinus obliquus pericardii



## Arteriae coronariae cordis

**vincula, ponticuli**



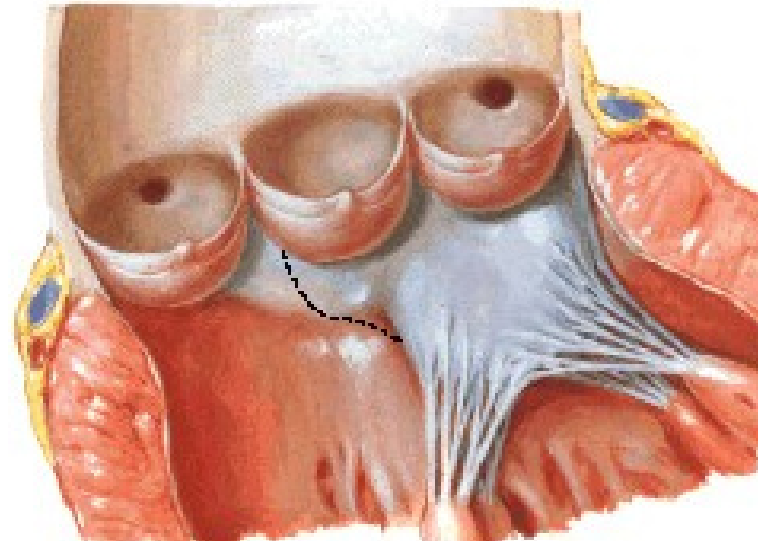
**Arteria coronaria cordis dextra**

**r. interventricularis post.**

**Arteria coronaria cordis sinistra**

**r. interventricularis ant.**

**r. circumflexus**



## Arteria coronaria cordis dextra

**ramus coni arteriosi**

**ramus nodi sinuatrialis**

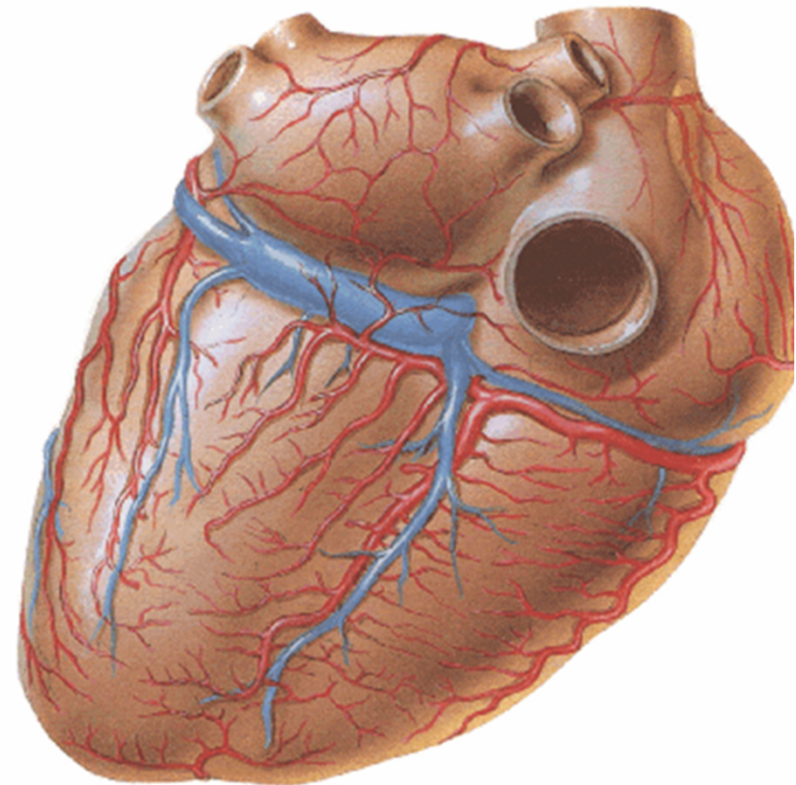
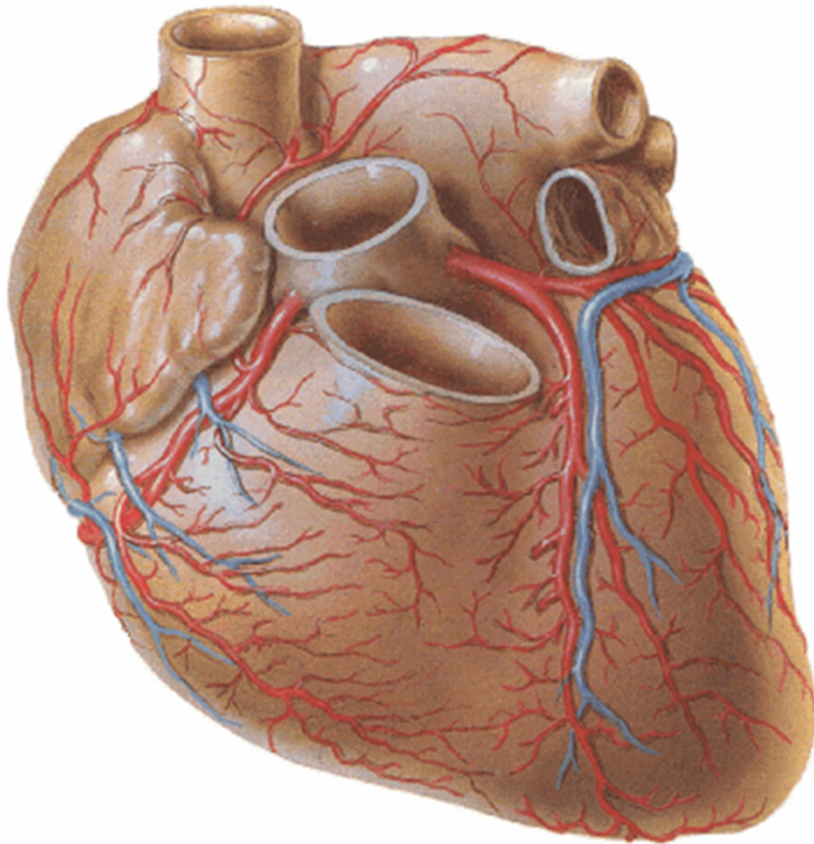
**ramus nodi atrioventricularis**

**rami atriales dx. et ventriculares dx.**

**ramus marginalis dx.**

**ramus interventricularis sept.**

**ramus interventricularis post.**



## Arteria coronaria cordis sinistra

ramus interventricularis ant.

r. conii arteriosi

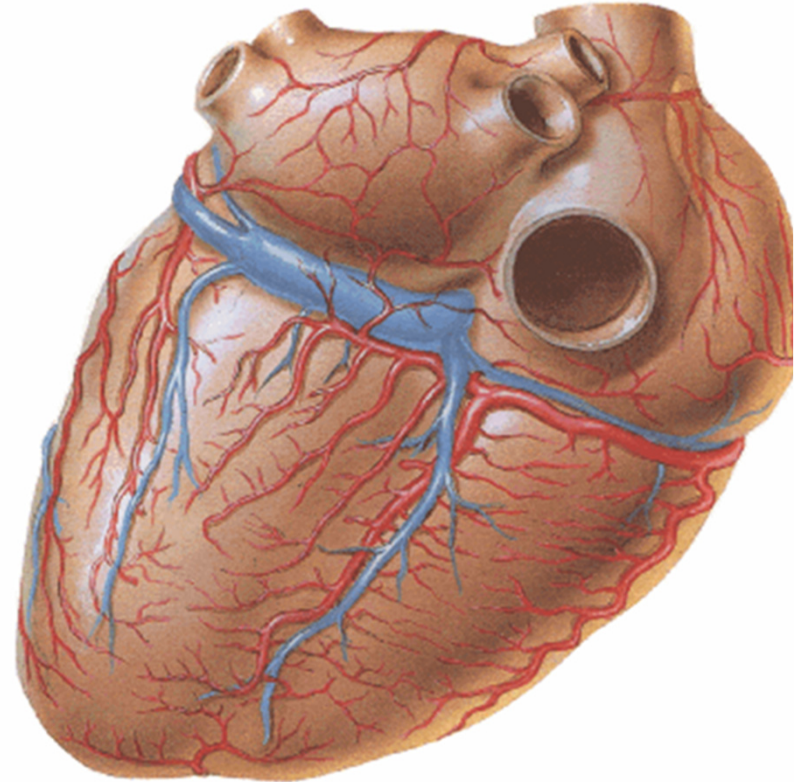
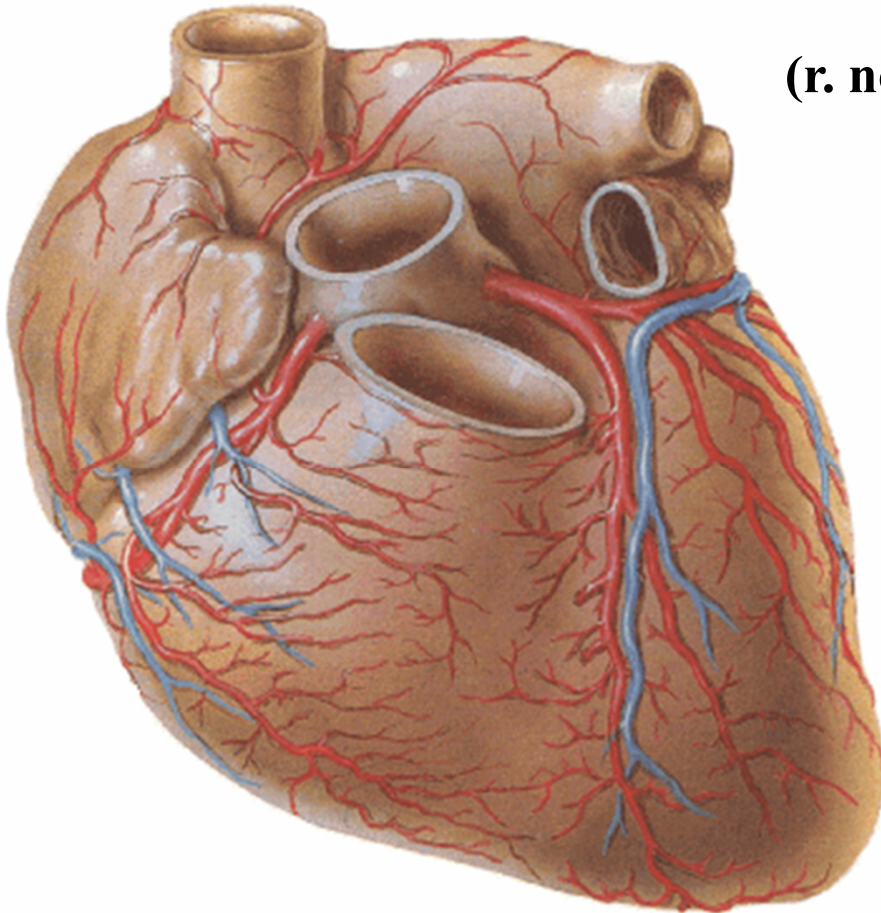
r. intervenricularis septalis

ramus circumflexus

rami atriales sin. et ventriculares sin.

ramus marginalis sin.

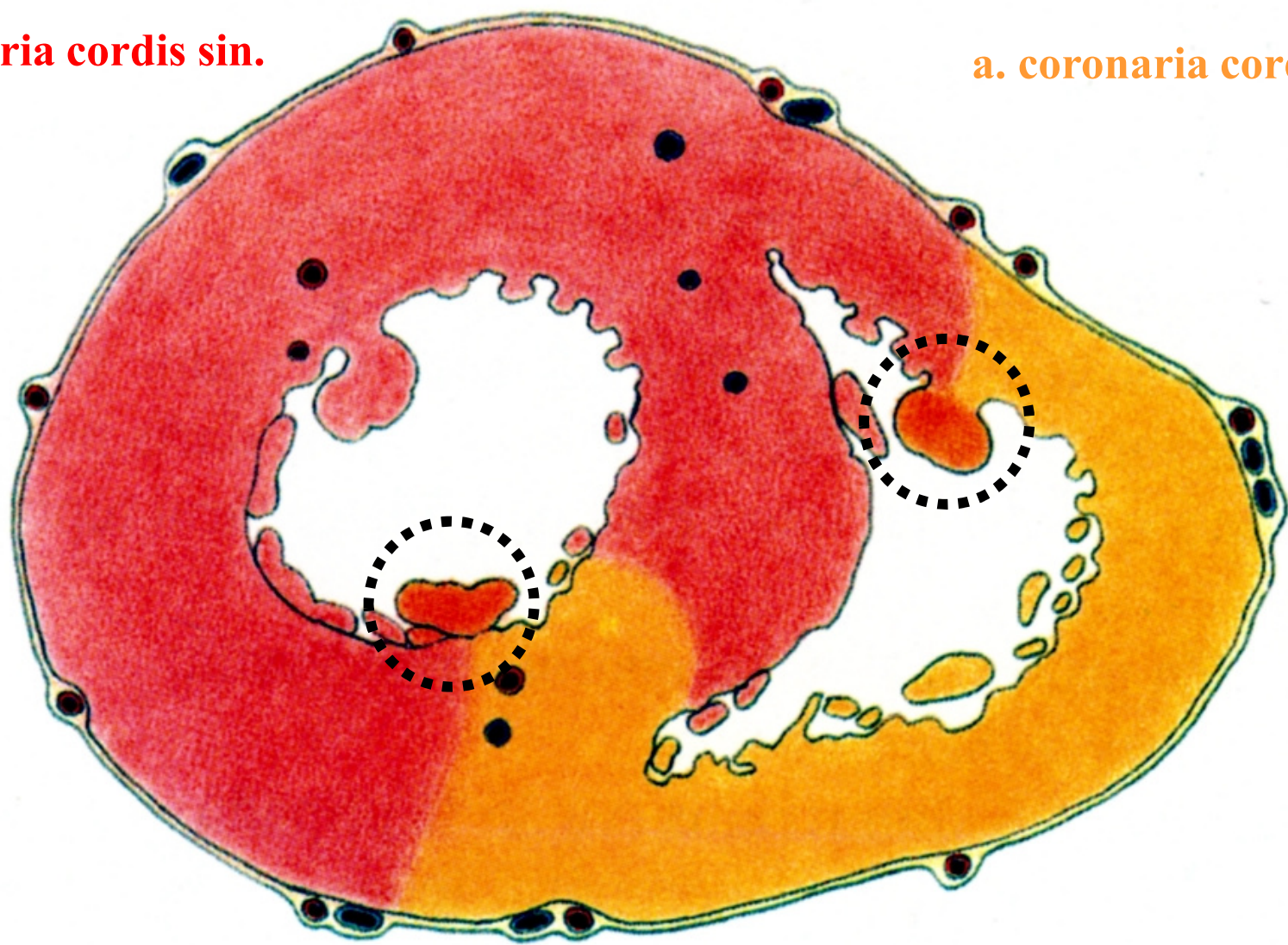
(r. nodi sinuatrialis r. nodi atrioventricularis)



facies sternocostalis

a. coronaria cordis sin.

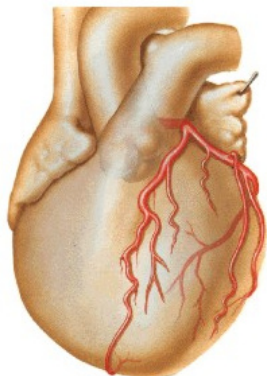
a. coronaria cordis dx.



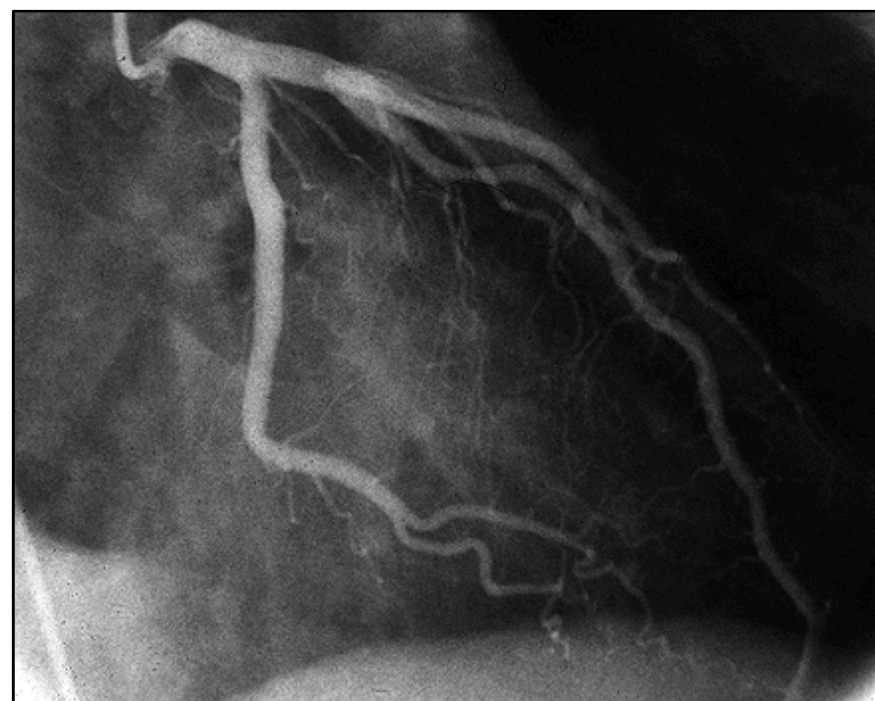
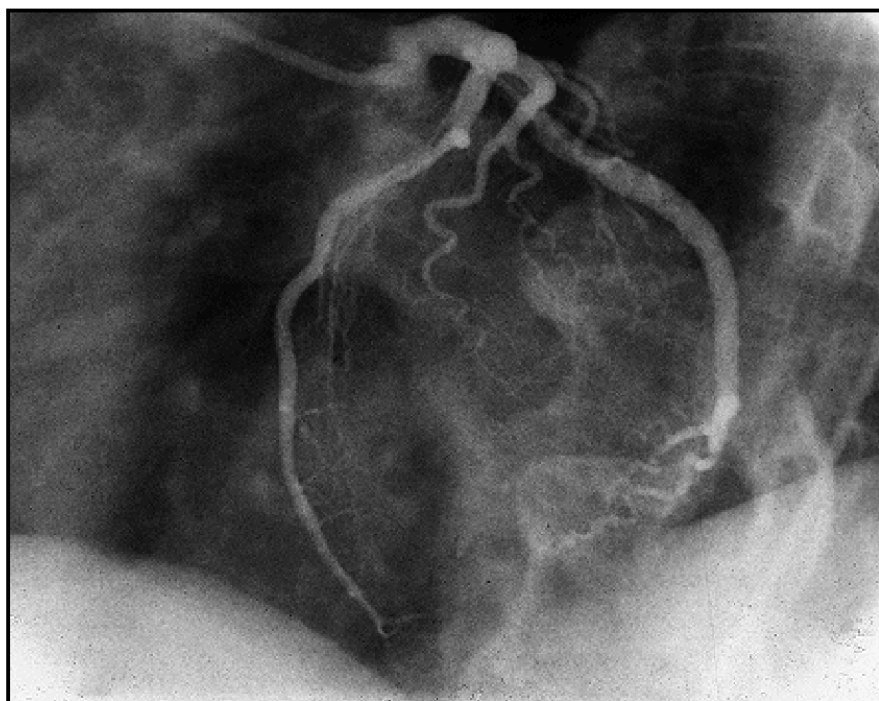
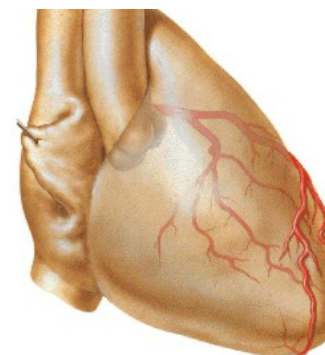
facies diaphragmatica

# Koronarografie (a. coronaria cordis sin.)

Levá přední šikmá projekce



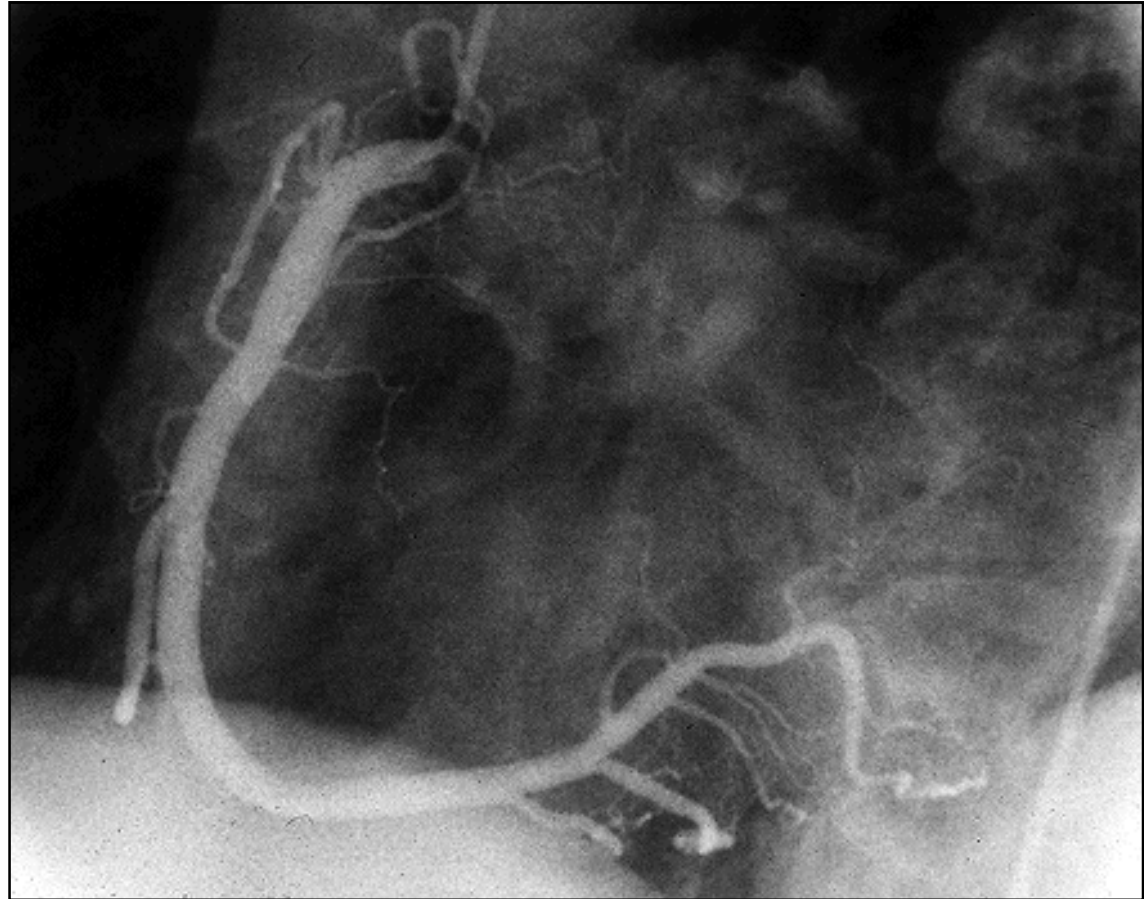
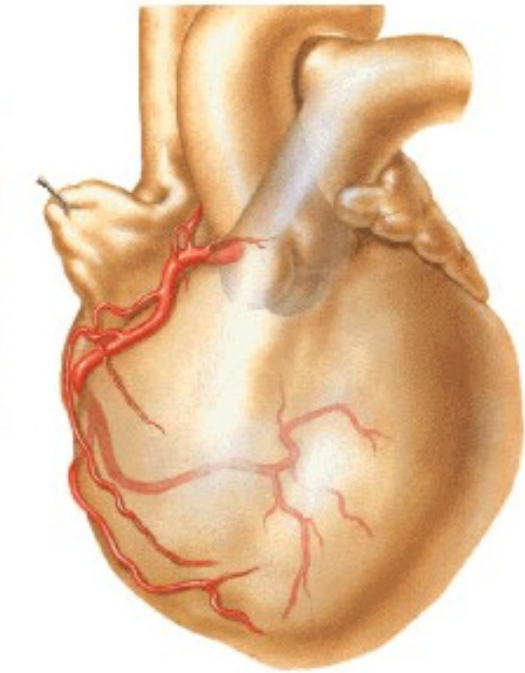
Pravá přední šikmá projekce





## Koronarografie (a. coronaria cordis dx.)

Levá přední šikmá projekce



# VENAE CORDIS

■ 60%  
sinus coronarius

v. cordis magna

v. cordis media

v. cordis parva

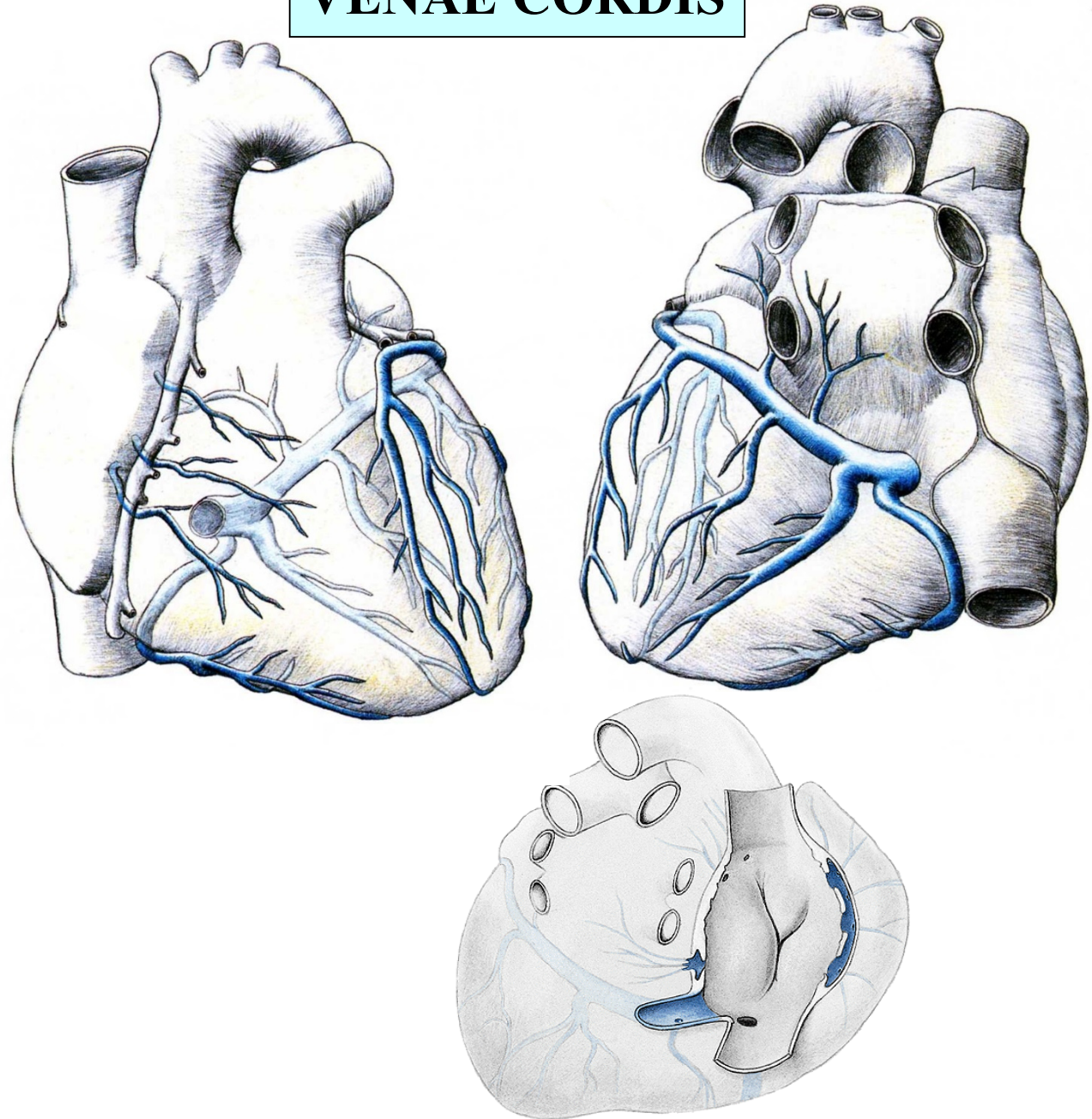
v. obliqua atrii sin

v. post. ventriculi s

■ 40%

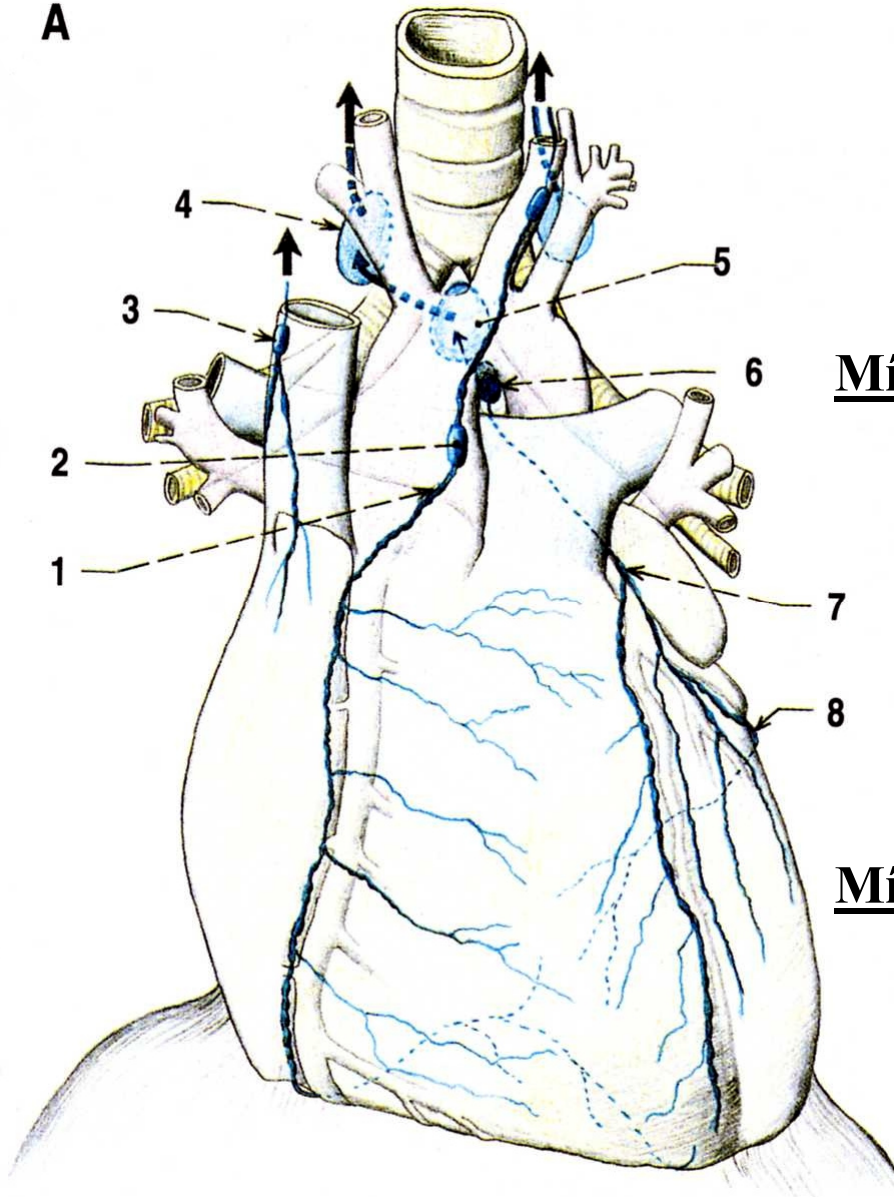
vv. cordis ant.

vv. cordis minimae



# MÍZNÍ CÉVY SRDCE

A



## Mízní síť ve stěně srdce:

Subendokardiální

Myokardiální

Subepikardiální

## Mízní kmeny podél cév:

Truncus lymphaticus anterior sin.

Truncus lymphaticus posterior

Truncus lymphaticus anterior dx.

## Mízní uzliny:

Nodus lym. praeaocticus, retroaorticus

## **INERVACE SRDCE**

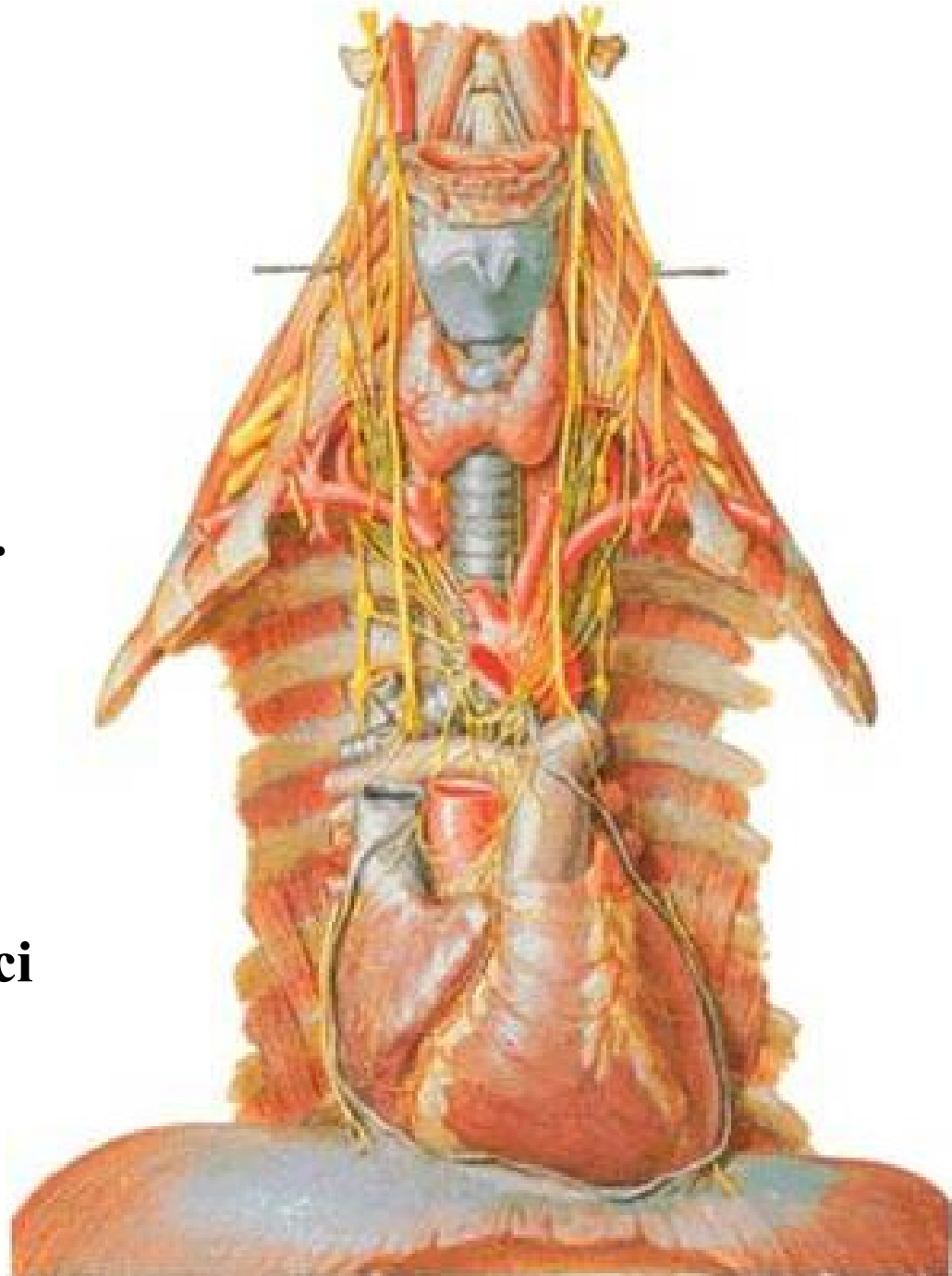
**Plexus cardiacus spf.  
(ganglion cardiacum)**

**Plexus cardiacus prof.**

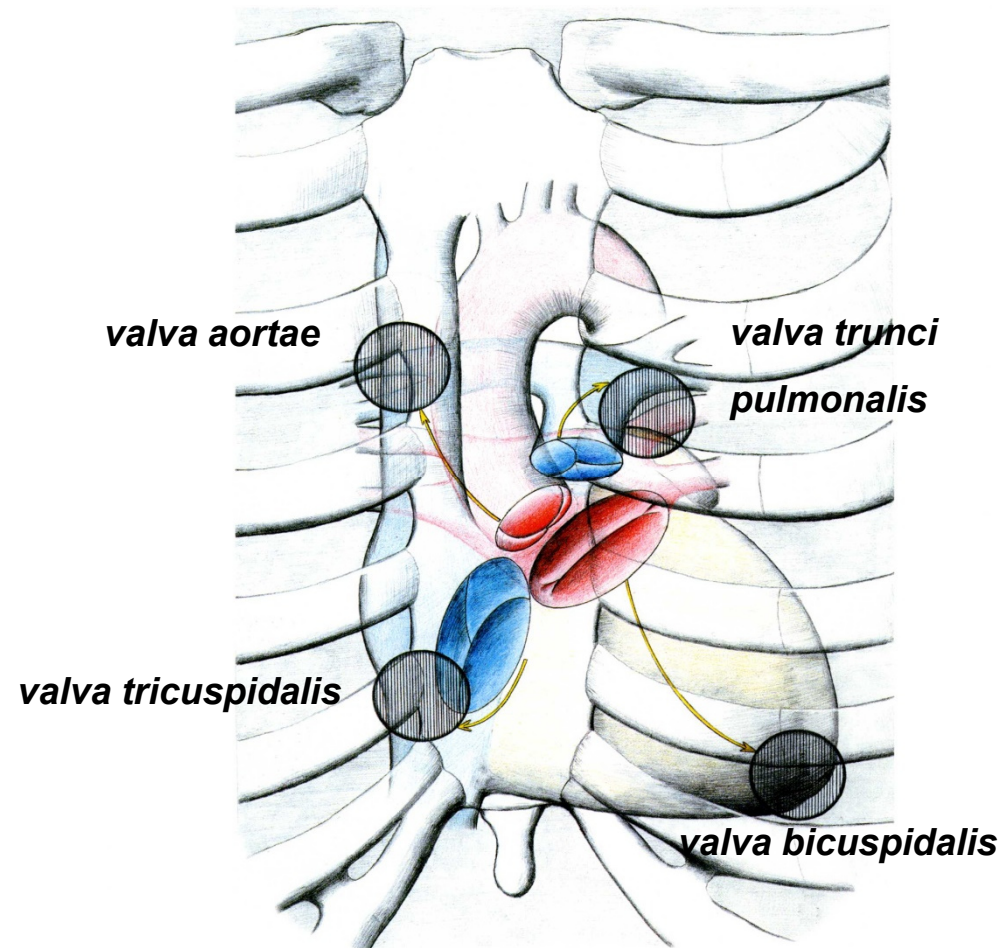
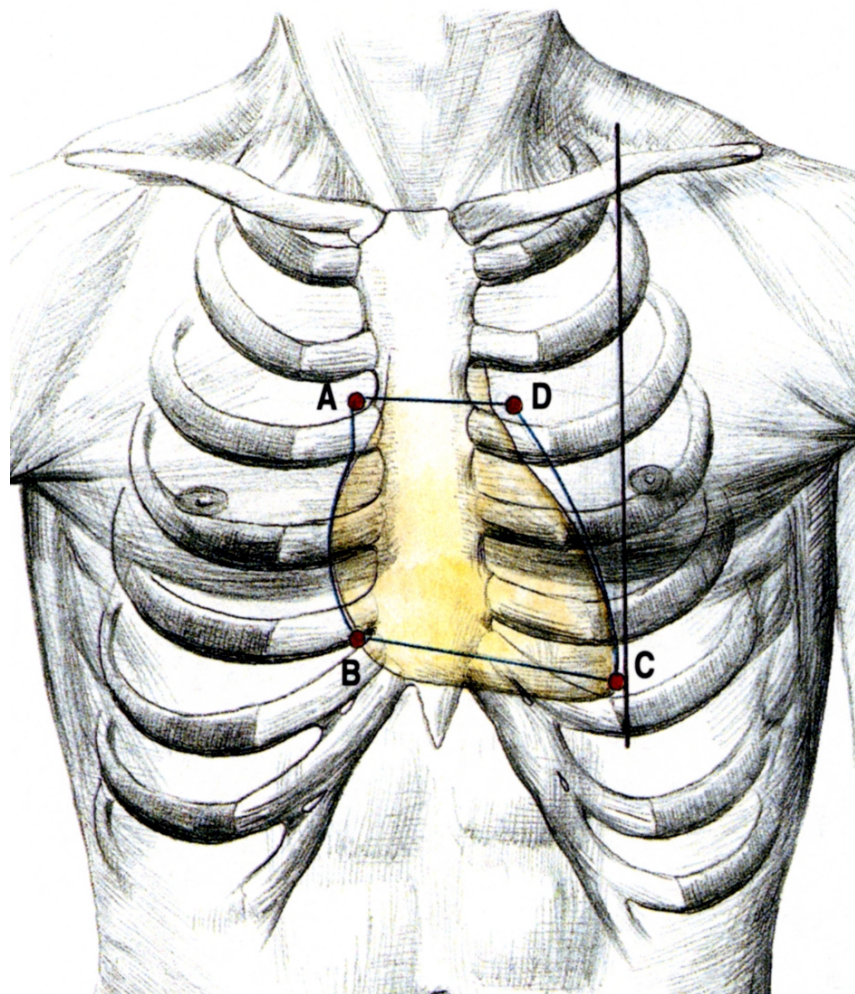
**Plexus coronarius dx. et sin.**

**Nn. accelerantes  
(sympaticus, nn. cardiaci)**

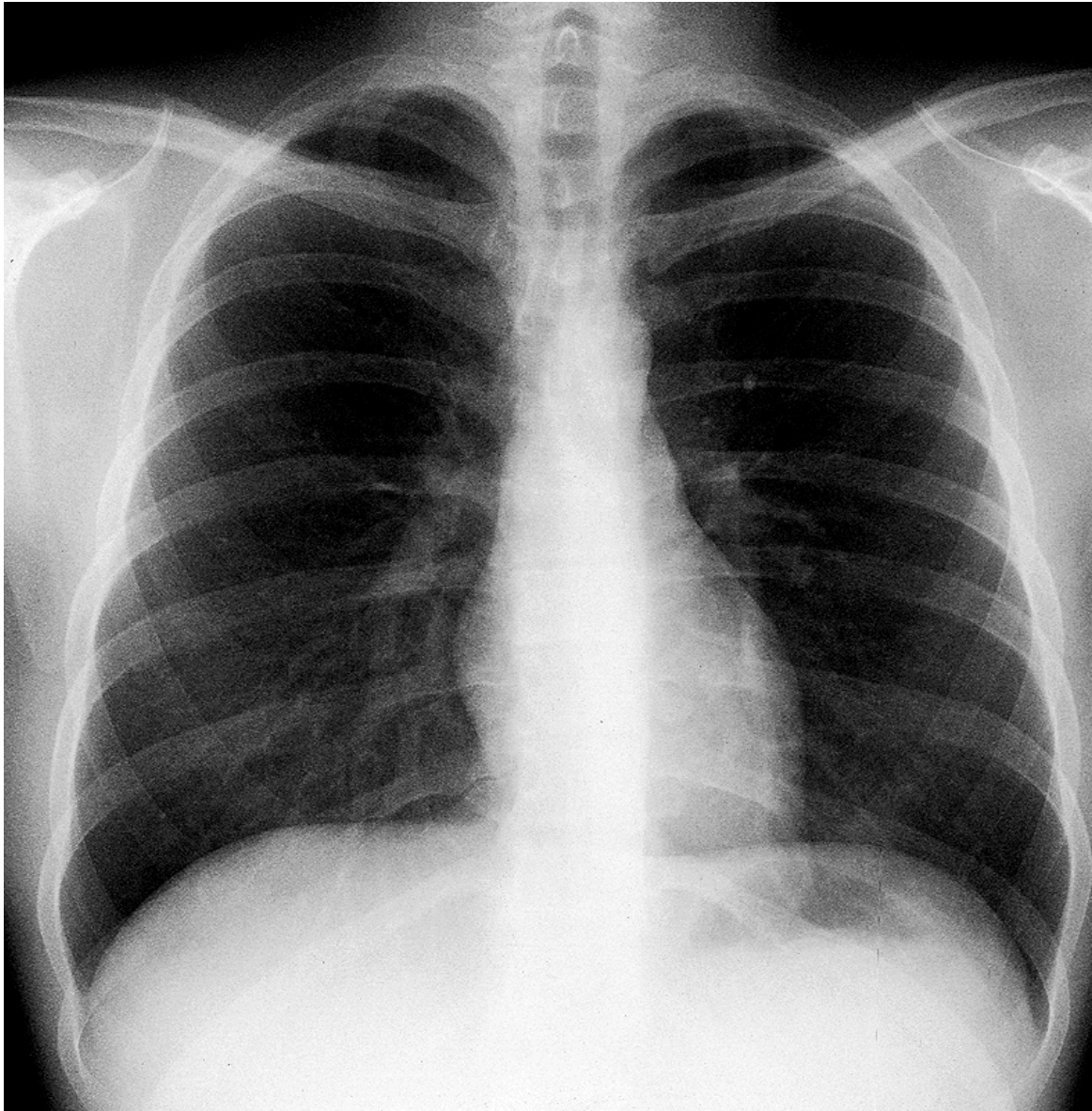
**Nn. retardantes  
(parasympaticus, rr. cardiaci  
n. vagi)**



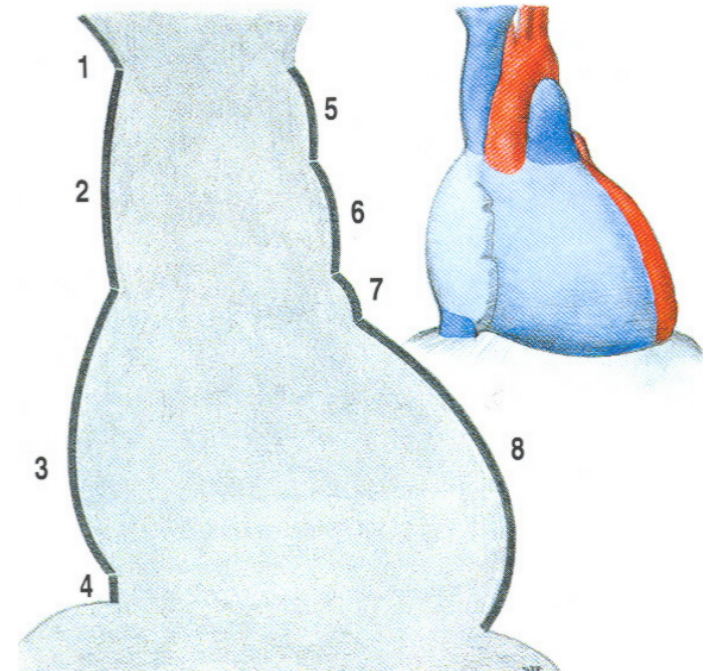
# AUSKULTAČNÍ BODY



# PROSTÝ SNÍMEK HRUDNÍKU



1. V. brachiocephalica dx.
2. V. cava sup.
3. Atrium dx.
4. V. cava inf.



5. Arcus aortae
6. Truncus pulmonalis
7. Auricula sin.
8. Ventriculus sin.

## Vasa (cévy)

**Arteriae**  
(terminales, collaterales)

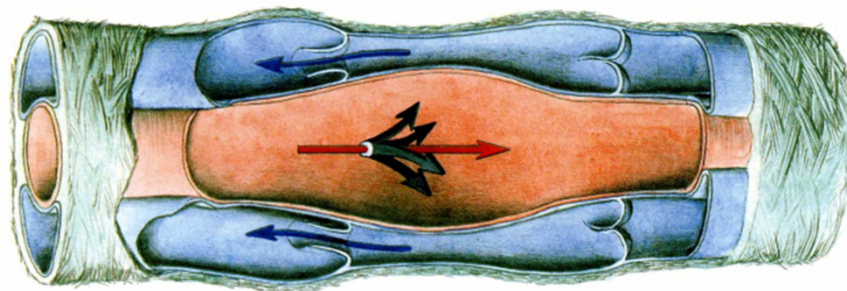
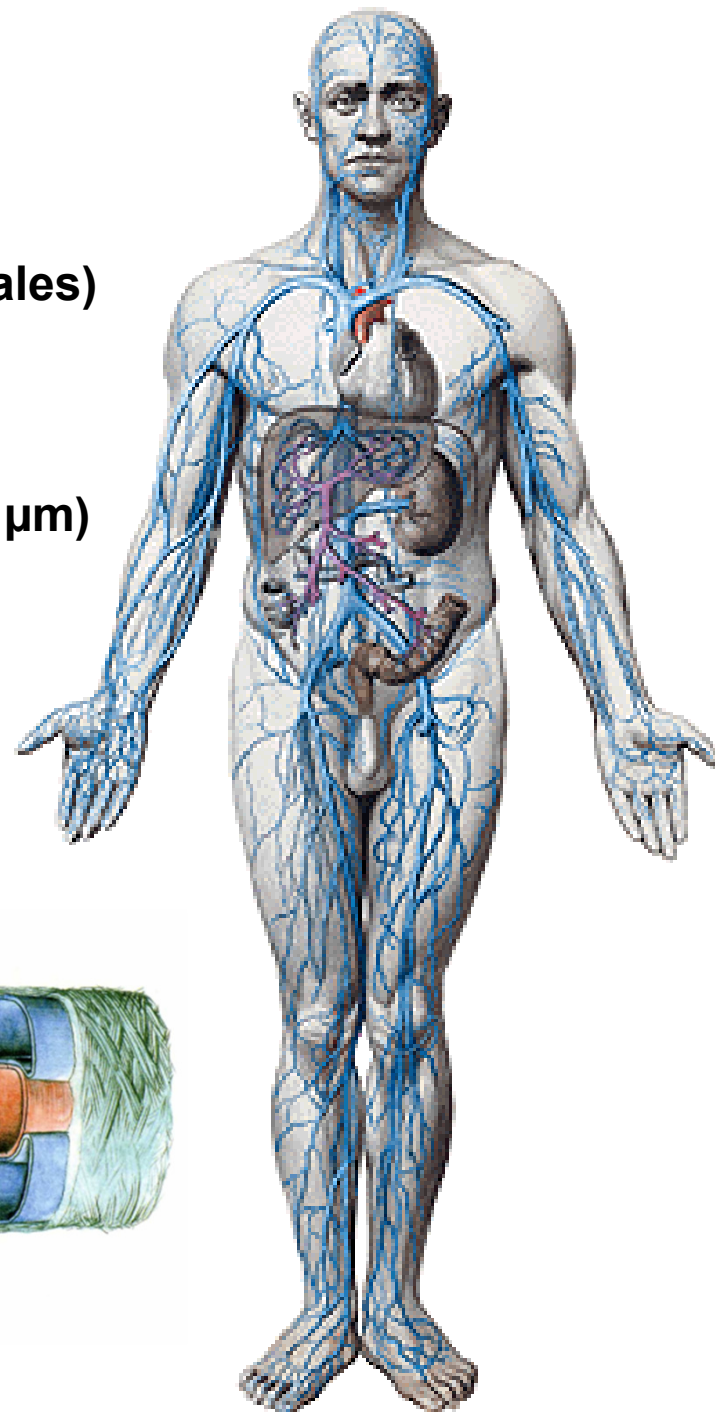
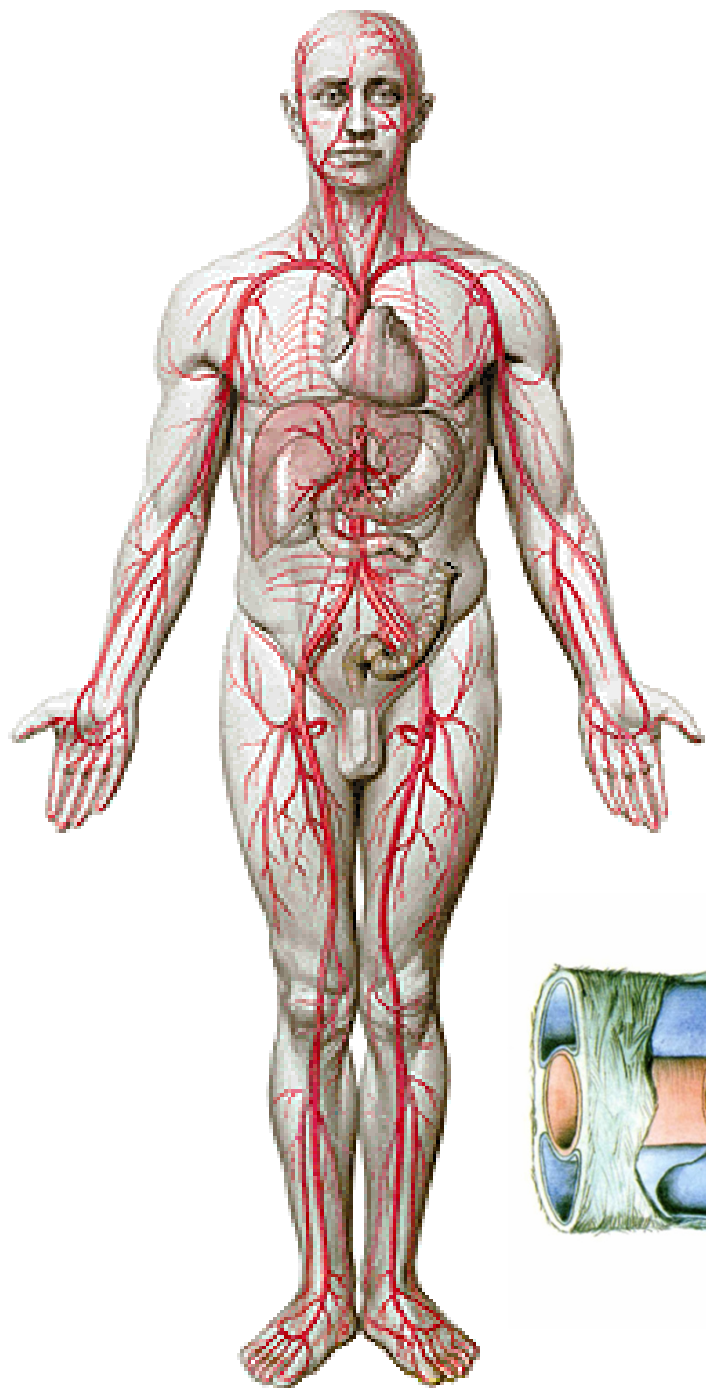
**Arteriolae**

**Vasa capillaria (7-15  $\mu\text{m}$ )**

**Venulae**

**Venae**

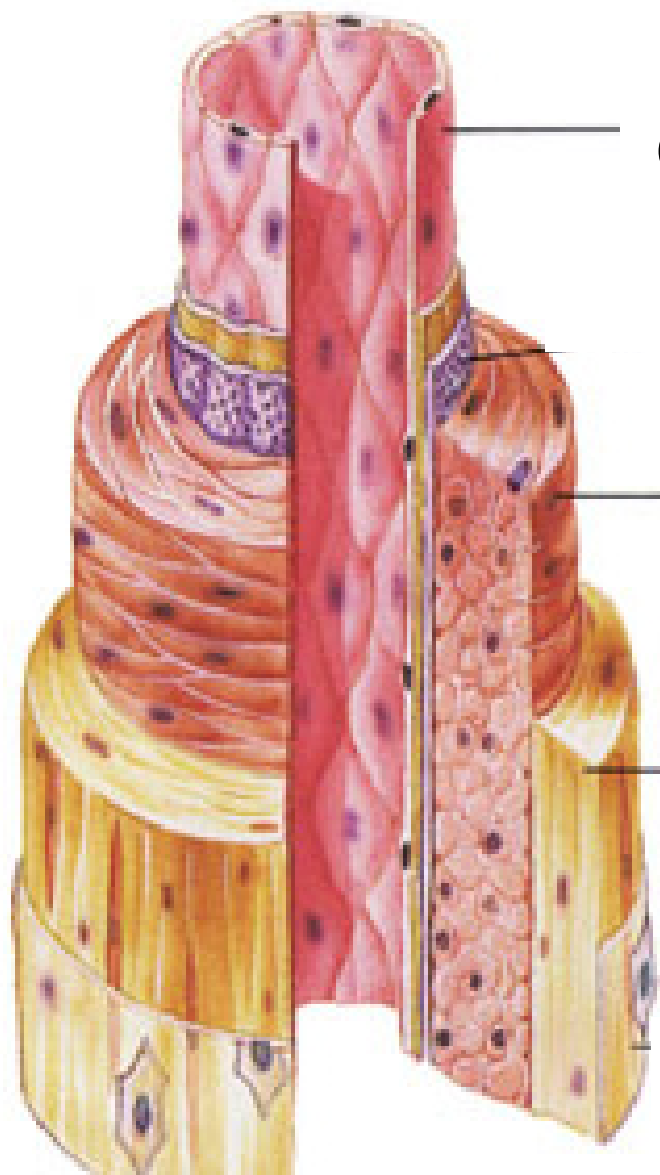
**Anastomoses**



# STAVBA STĚNY CÉV

**ARTERIA**

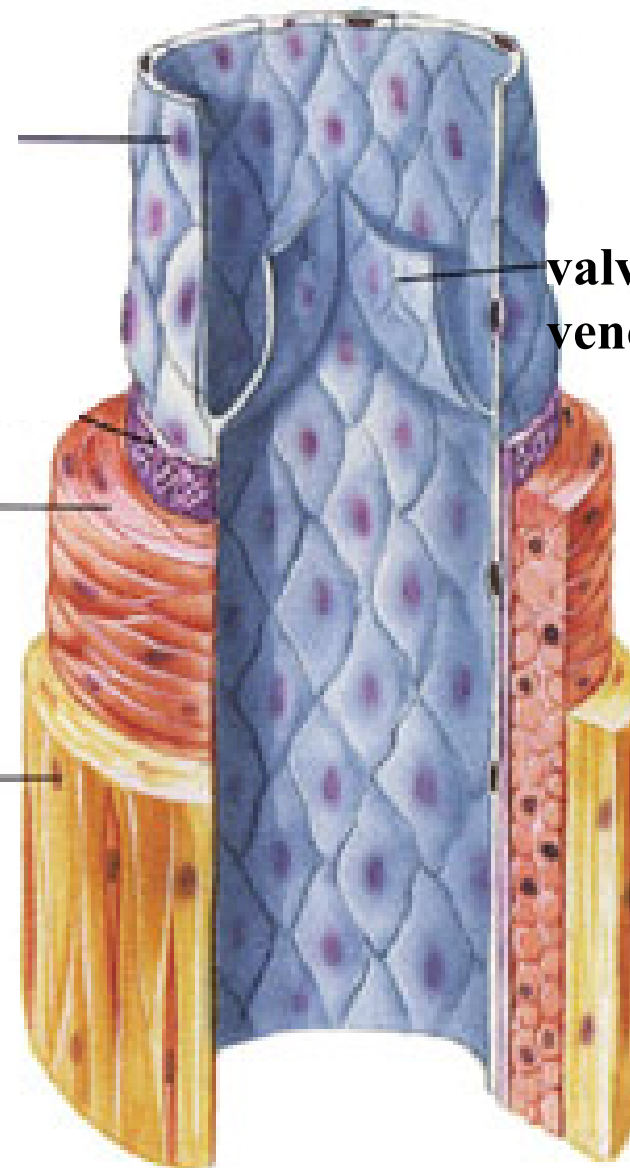
**VENA**



**tunica intima  
(endotel, elastin)**

**tunica media  
(svalovina)**

**tunica externa  
(adventicie)  
vasa vasorum  
inervace**



**valvulae  
venosae**

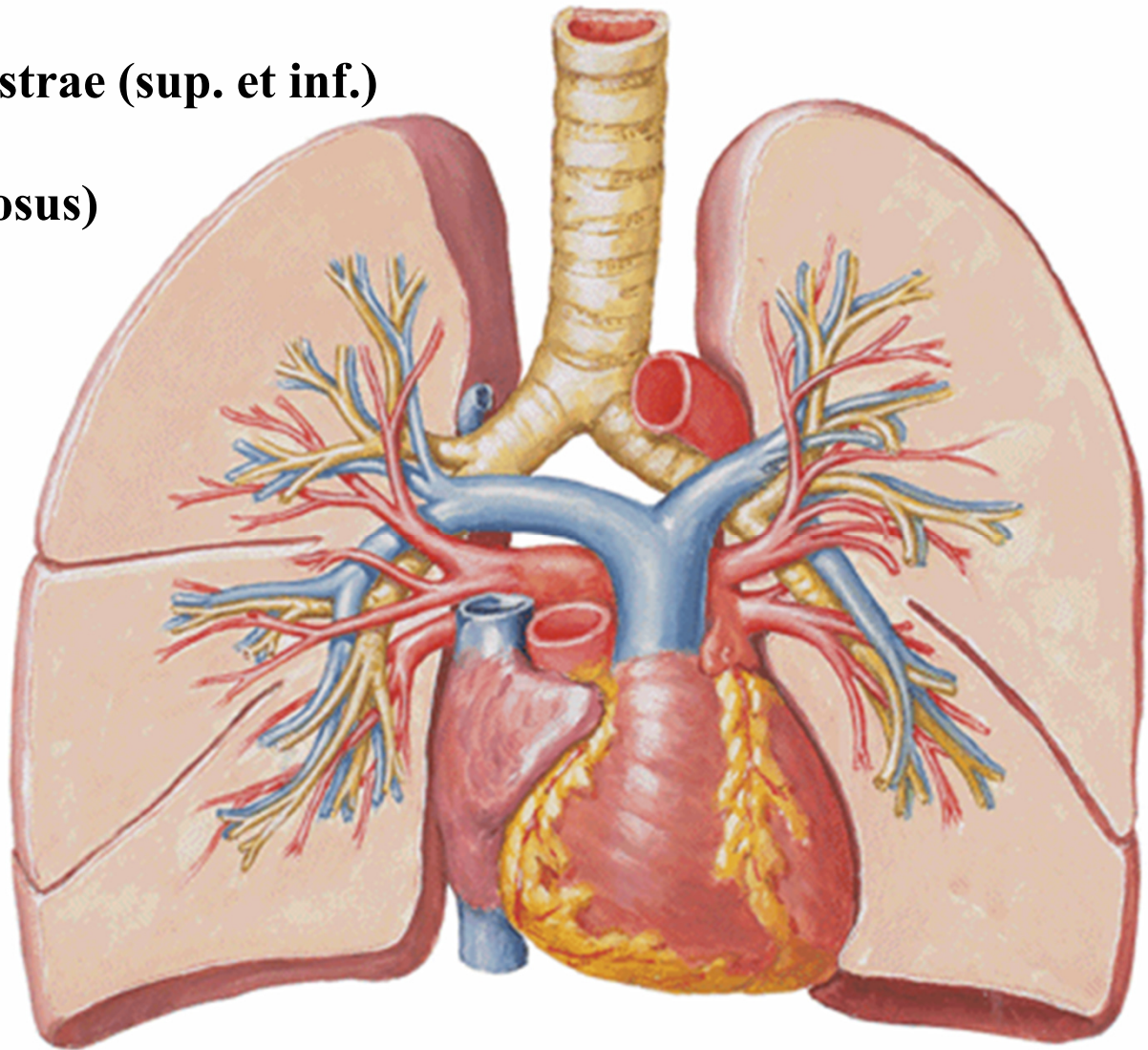
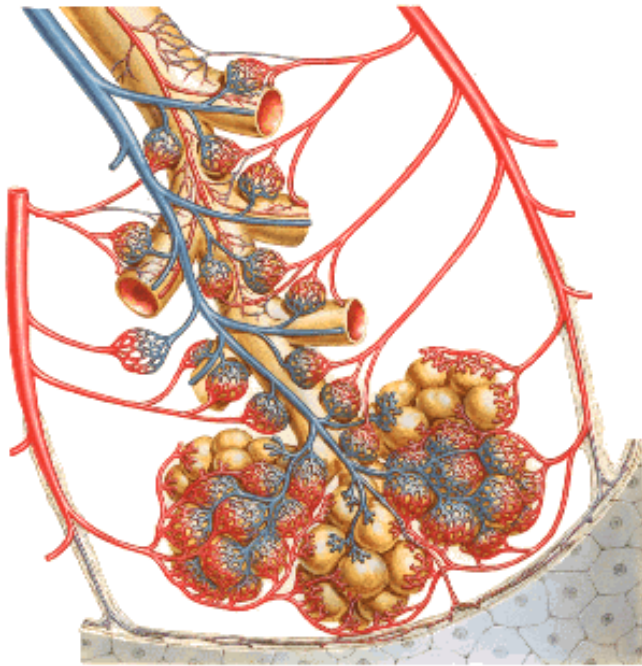


# TRUNCUS PULMONALIS

**arteria pulmonalis dx. et sin. (úhel 180<sup>0</sup>)**

**vv. pulmonales dextrae et sinistrae (sup. et inf.)**

**lig. arteriosum (ductus arteriosus)**



# AORTA

AORTA ASCENDENS

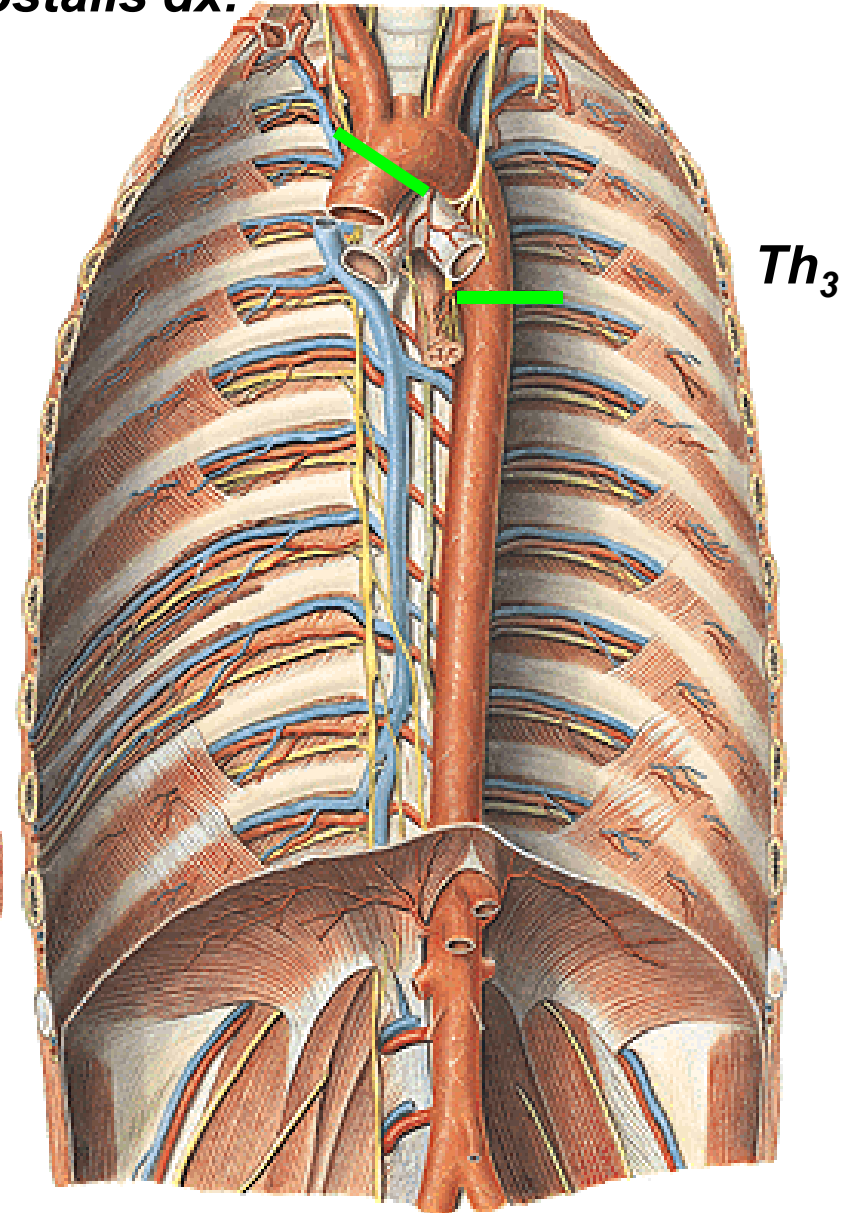
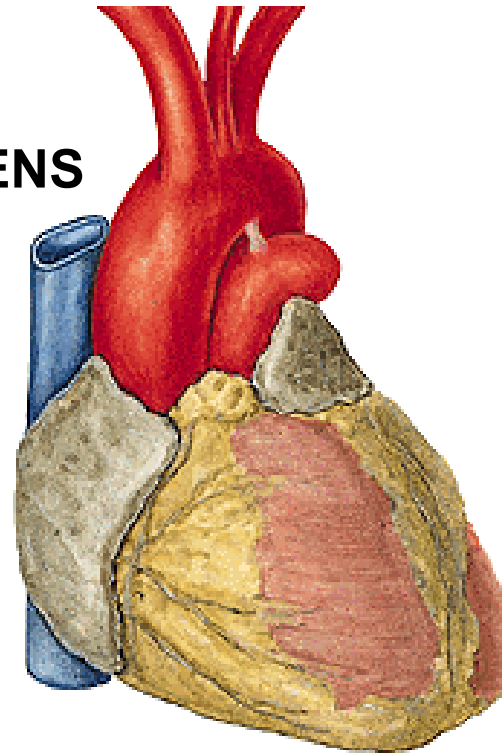
ARCUS AORTAE

AORTA DESCENDENS

Aorta thoracica

Aorta abdominalis

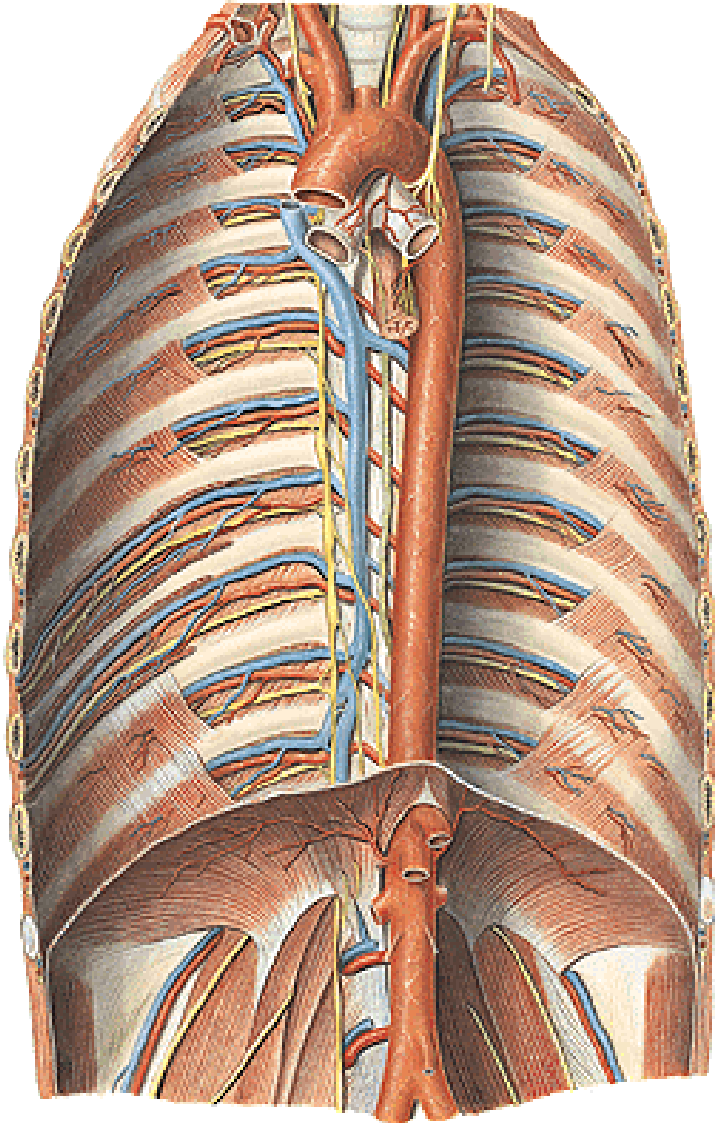
*2. art. sternocostalis dx.*



L<sub>4</sub> (bifurcatio aortae)

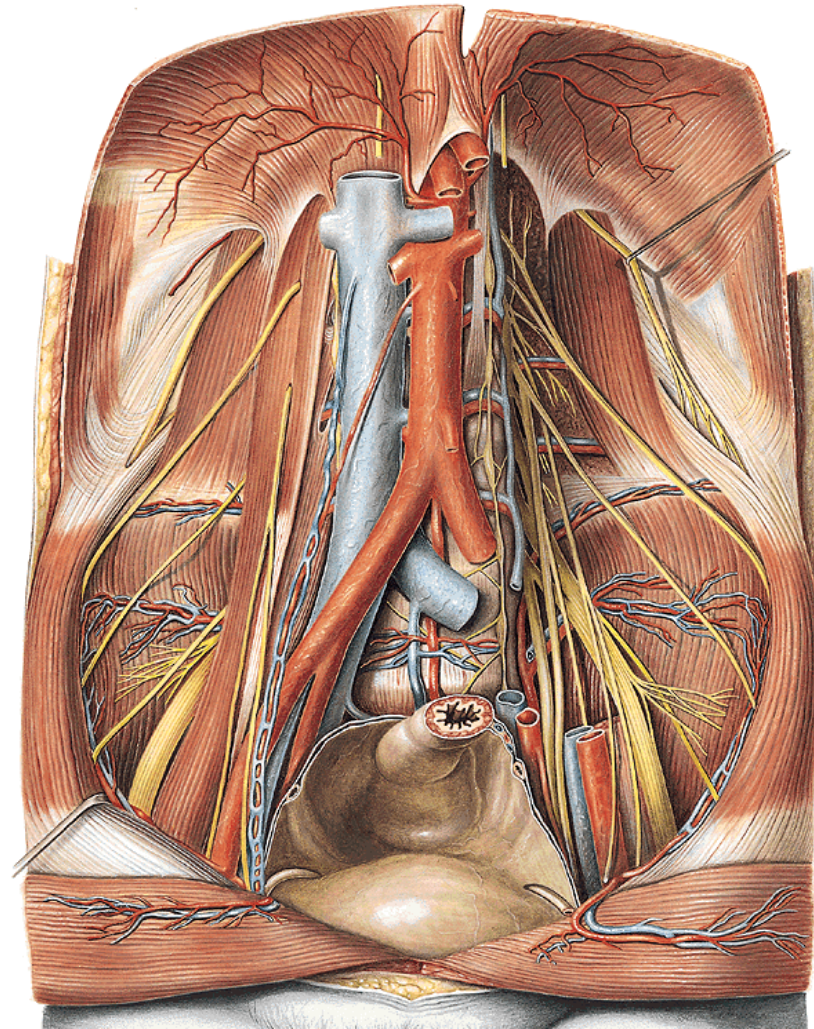
## AORTA THORACICA

*Th*<sub>3</sub>–*Th*<sub>11-12</sub>

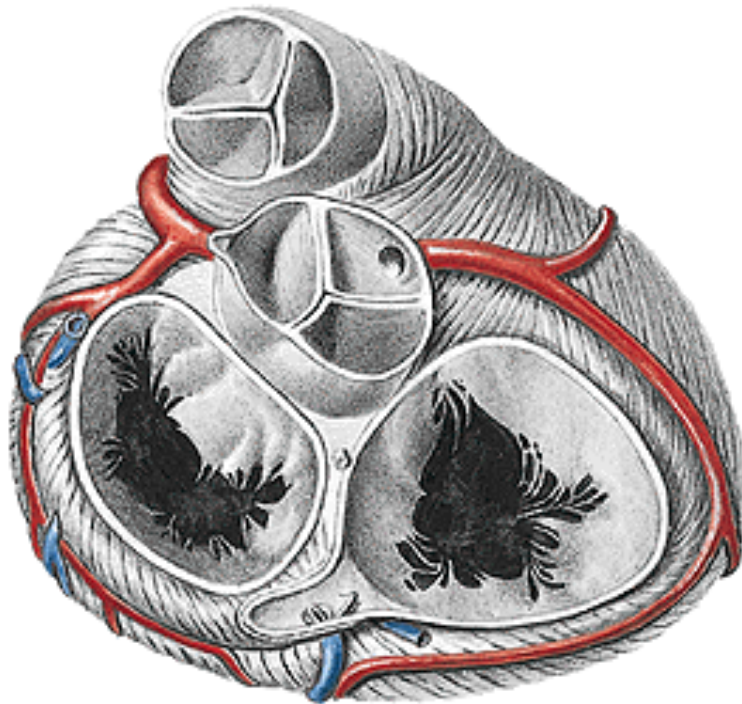
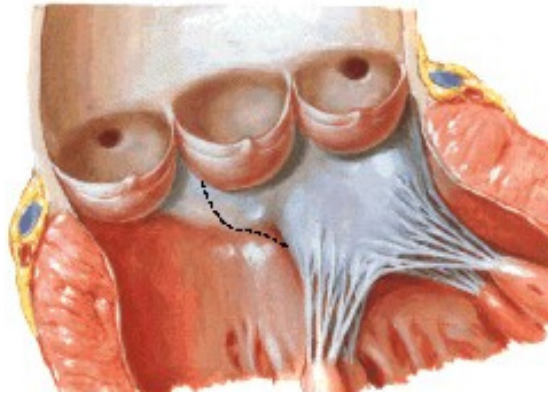


## AORTA ABDOMINALIS

bránice *Th*<sub>11-12</sub> – *L*<sub>4</sub> bifurcatio aortae

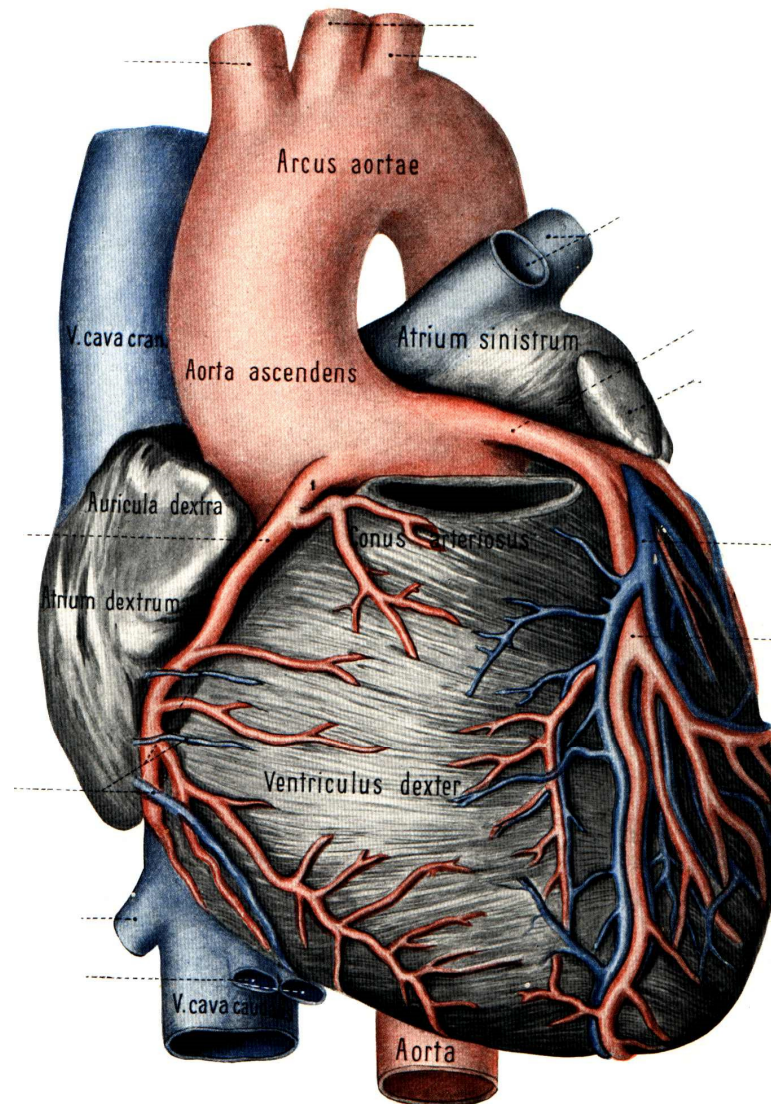


# AORTA ASCENDENS



Arteria coronaria cordis dx. et sin.

Bulbus aortae



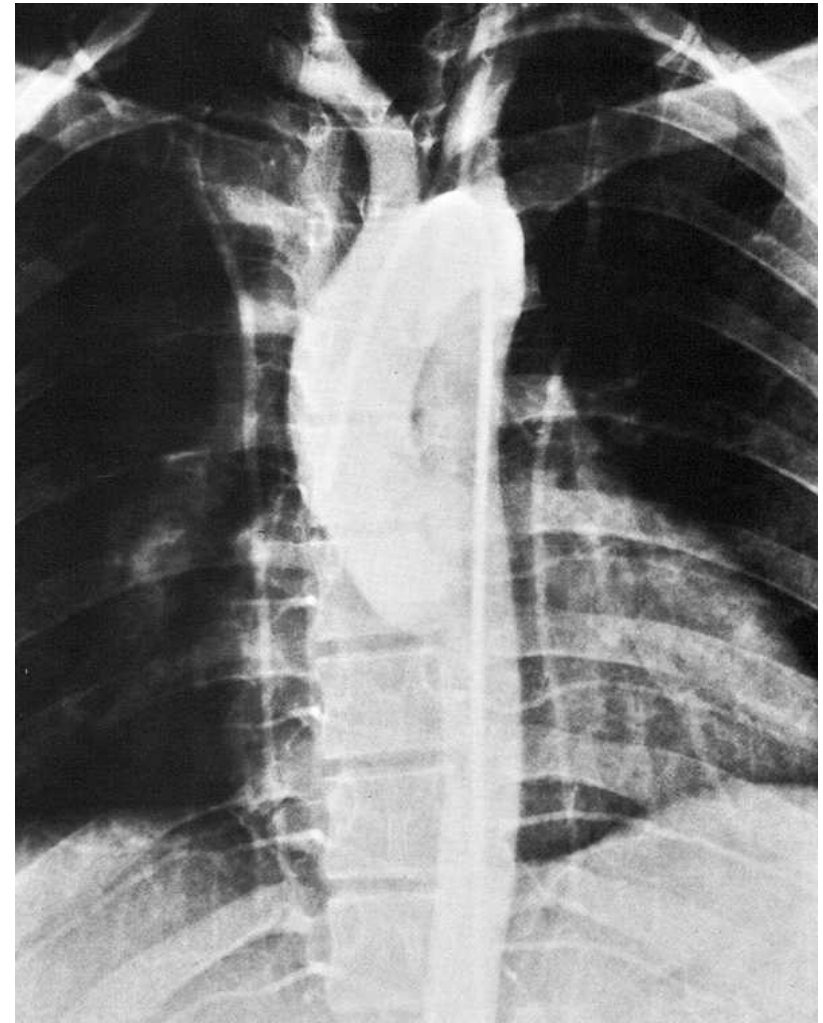
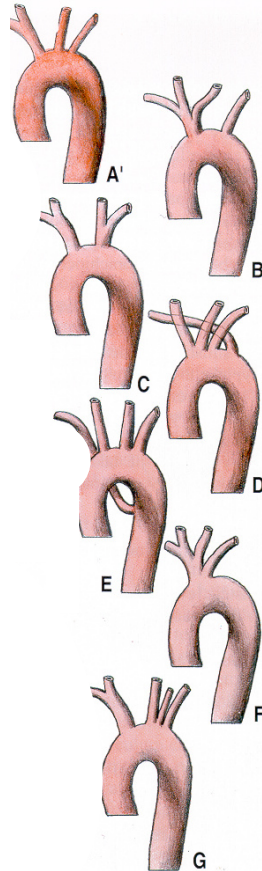
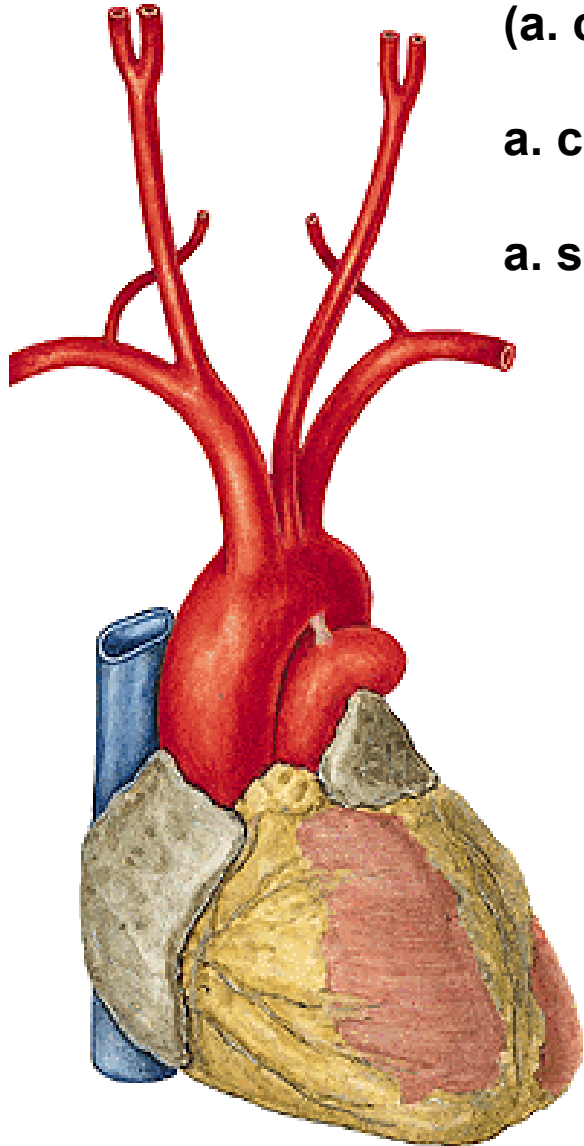
# ARCUS AORTAE

truncus brachiocephalicus (art. sternoclavicularis dx.)

(a. carotis comm. dx., a. subclavia dx.)

a. carotis comm. sin.

a. subclavia sin.

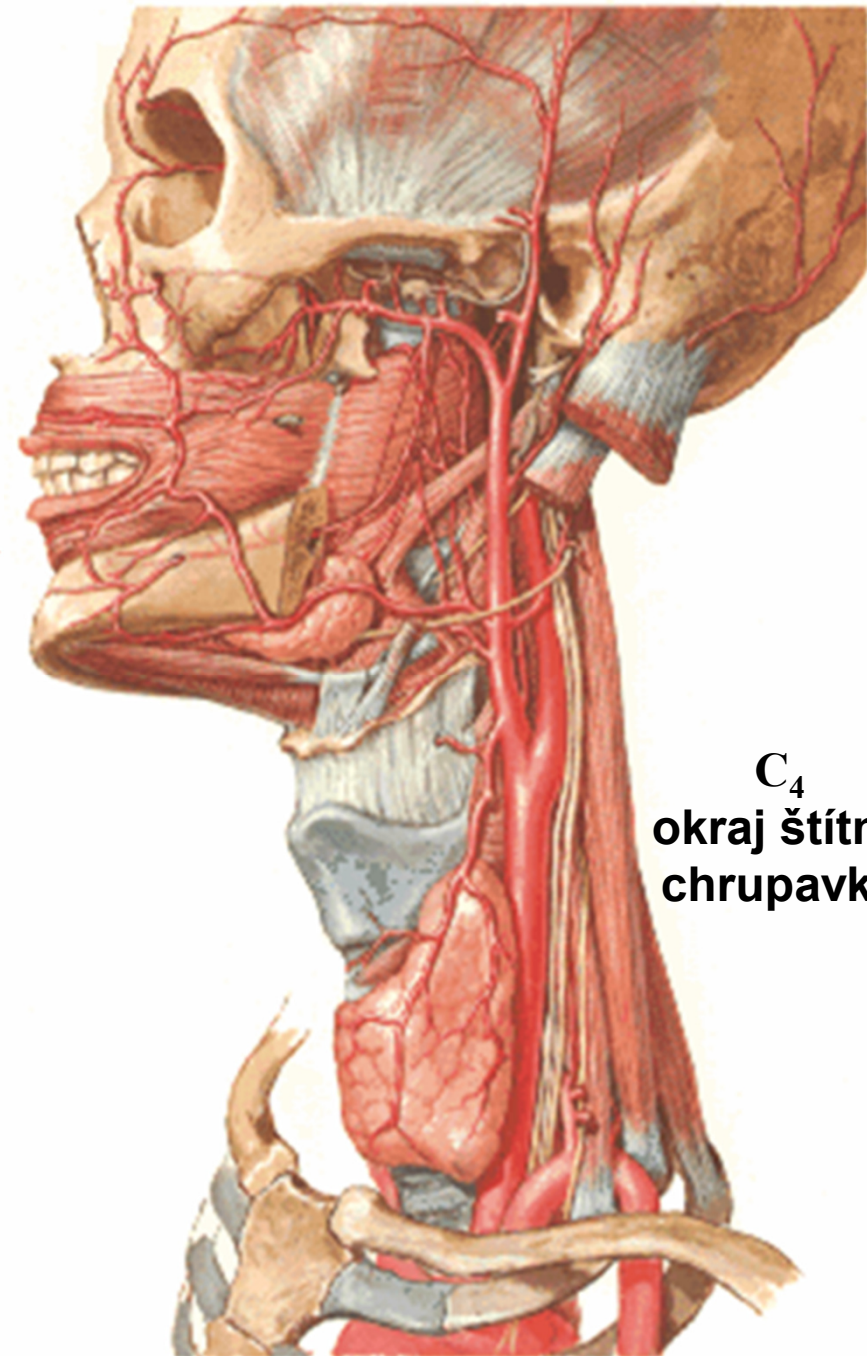
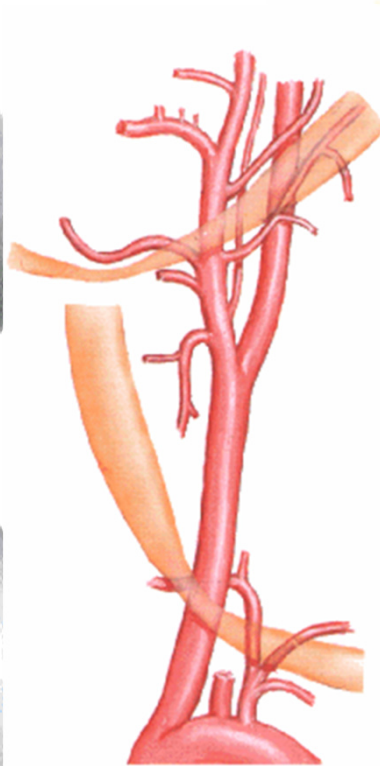
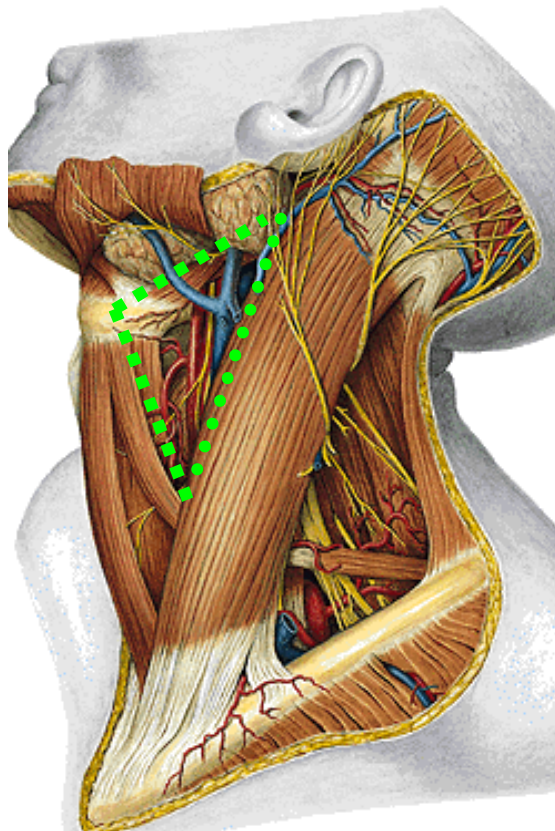


# A. CAROTIS COMMUNIS

A. carotis interna et externa

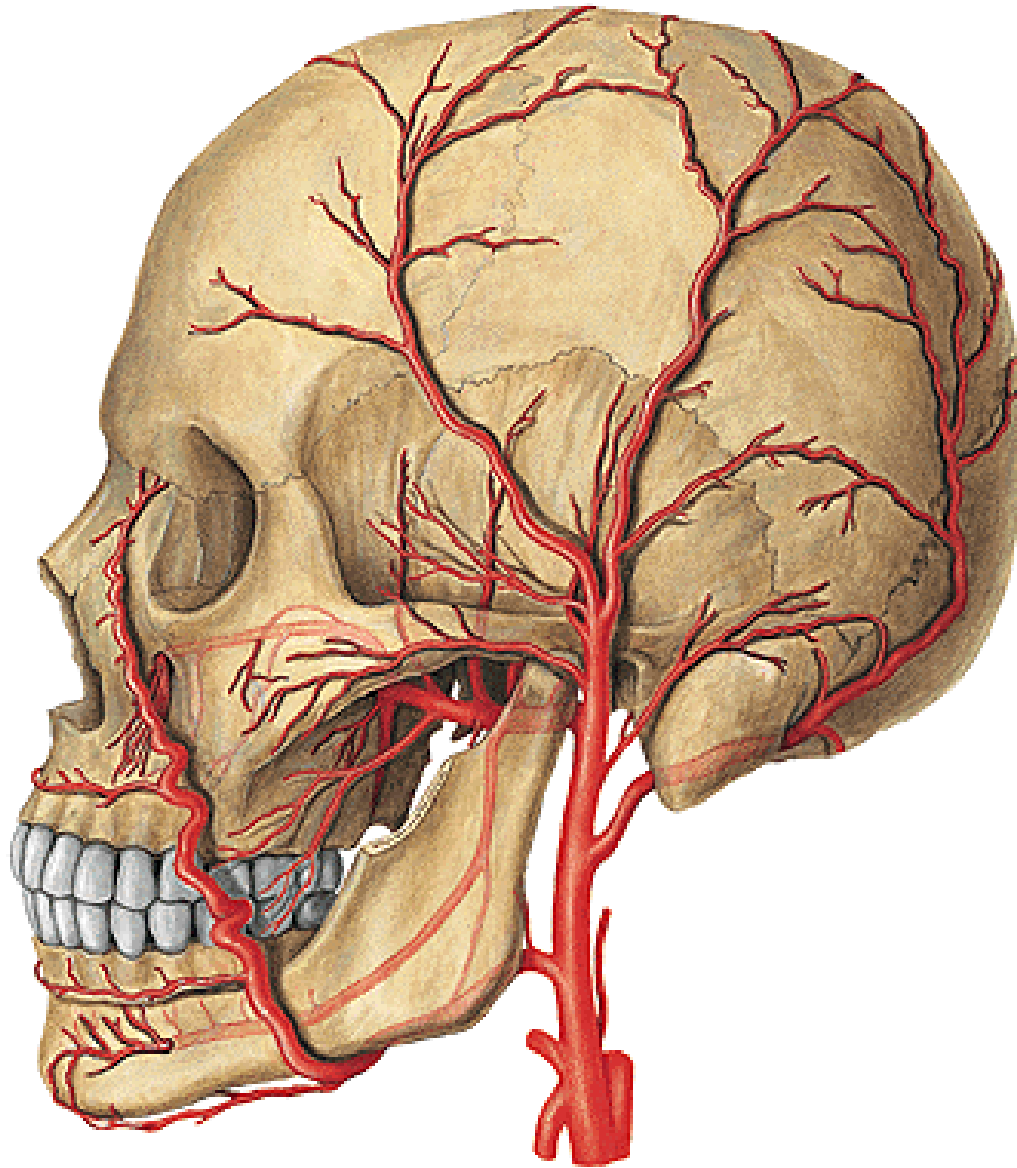
Trigonum caroticum

Glomus caroticum (chemoreceptor)



C<sub>4</sub>  
okraj štítné  
chrupavky

# ARTERIA CAROTIS EXTERNA



## Ventrální větve:

- a. thyroidea sup.
- a. lingualis
- a. facialis

## Dorsální větve:

- a. occipitalis
- a. auricularis post.

## Mediální větve:

- a. pharyngea asc.

## Laterální větve:

- a. sternocleidomastoidea

## Terminální větve:

- a. maxillaris
- a. temporalis spf.

## ARTERIA THYROIDEA SUP.

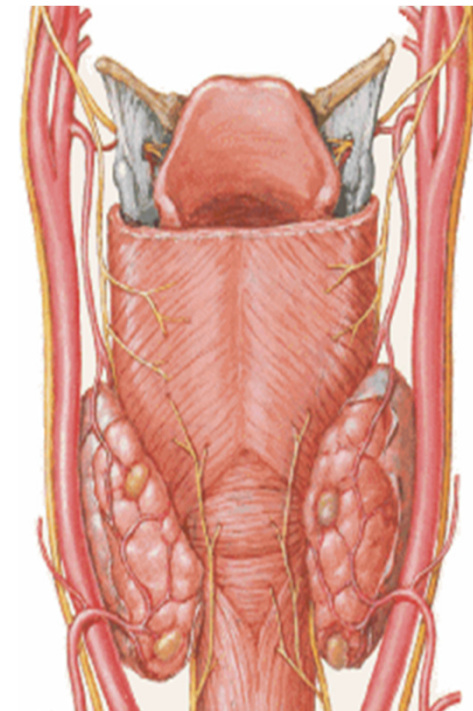
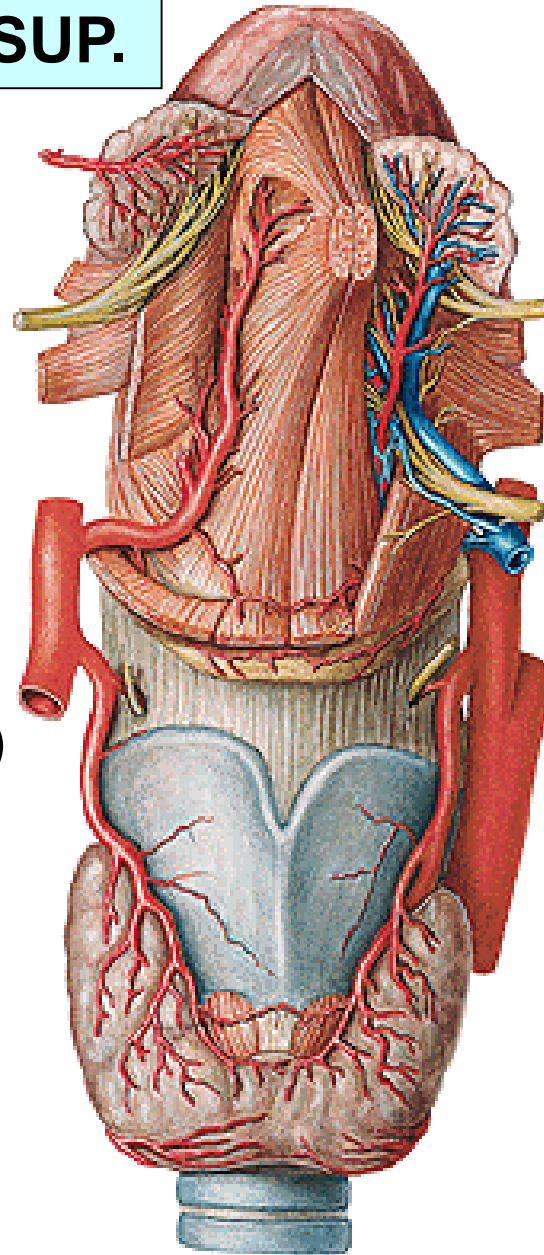
a. laryngea sup.

r. cricothyroideus

rr. glandulares

(r. infrahyoideus)

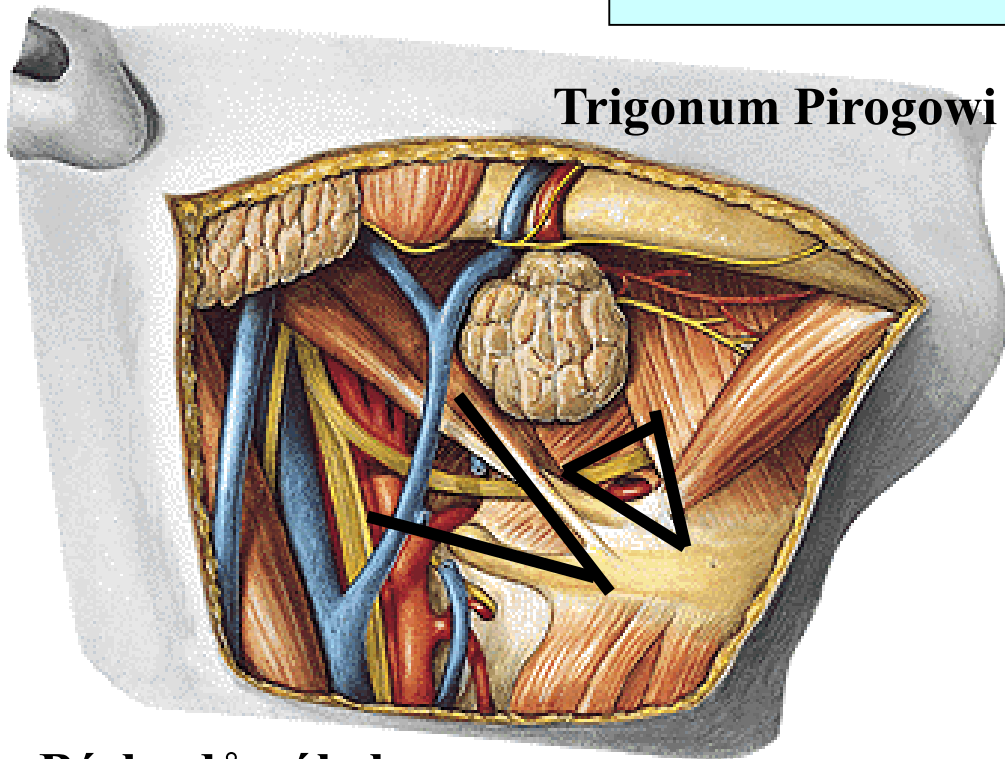
(r. sternocleidomastoideus)



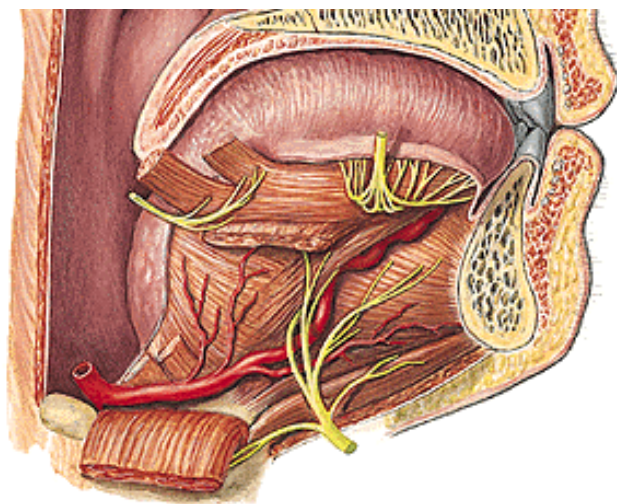


# ARTERIA LINGUALIS

Trigonum Pirogowi



Béclardův úhel

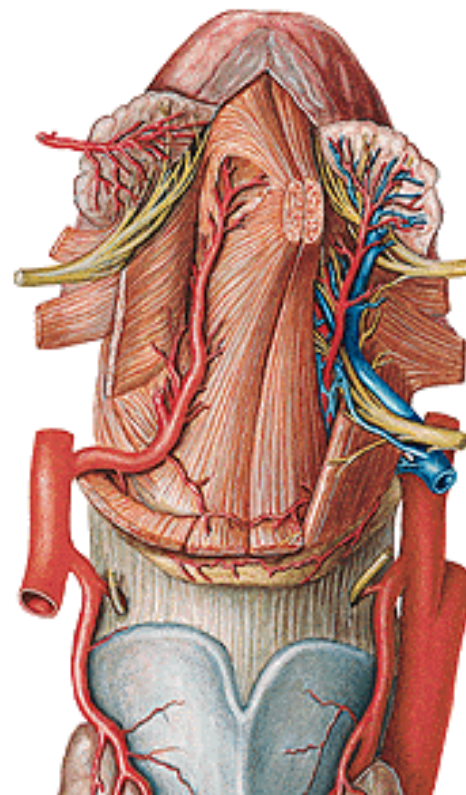


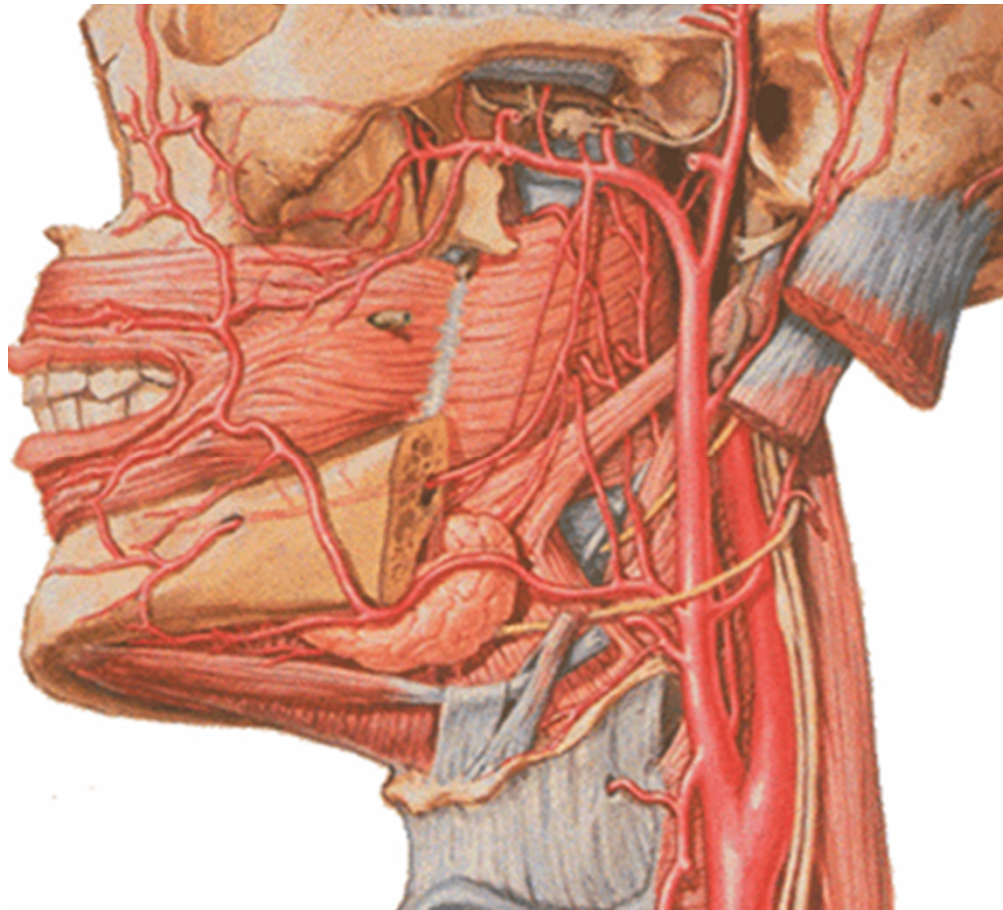
r. suprahyoideus

a. sublingualis

rr. dorsales linguae

a. profunda linguae





**a. palatina ascendens, r. tonsillaris**

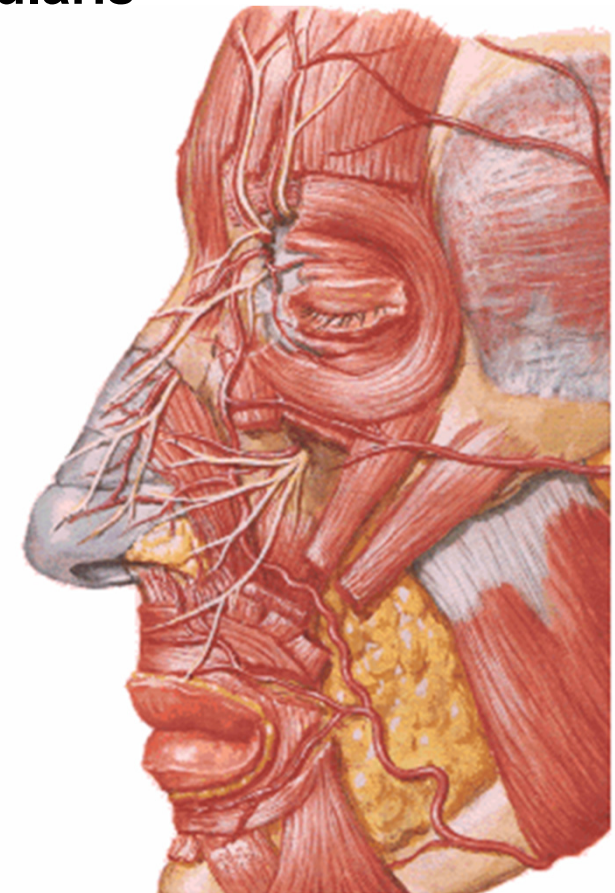
**a. submentalis, rr. glandulares**

## **ARTERIA FACIALIS**

**a. labialis sup. et inf.  
(circulus arteriosus oris)**

**a. alaris nasi**

**a. angularis**

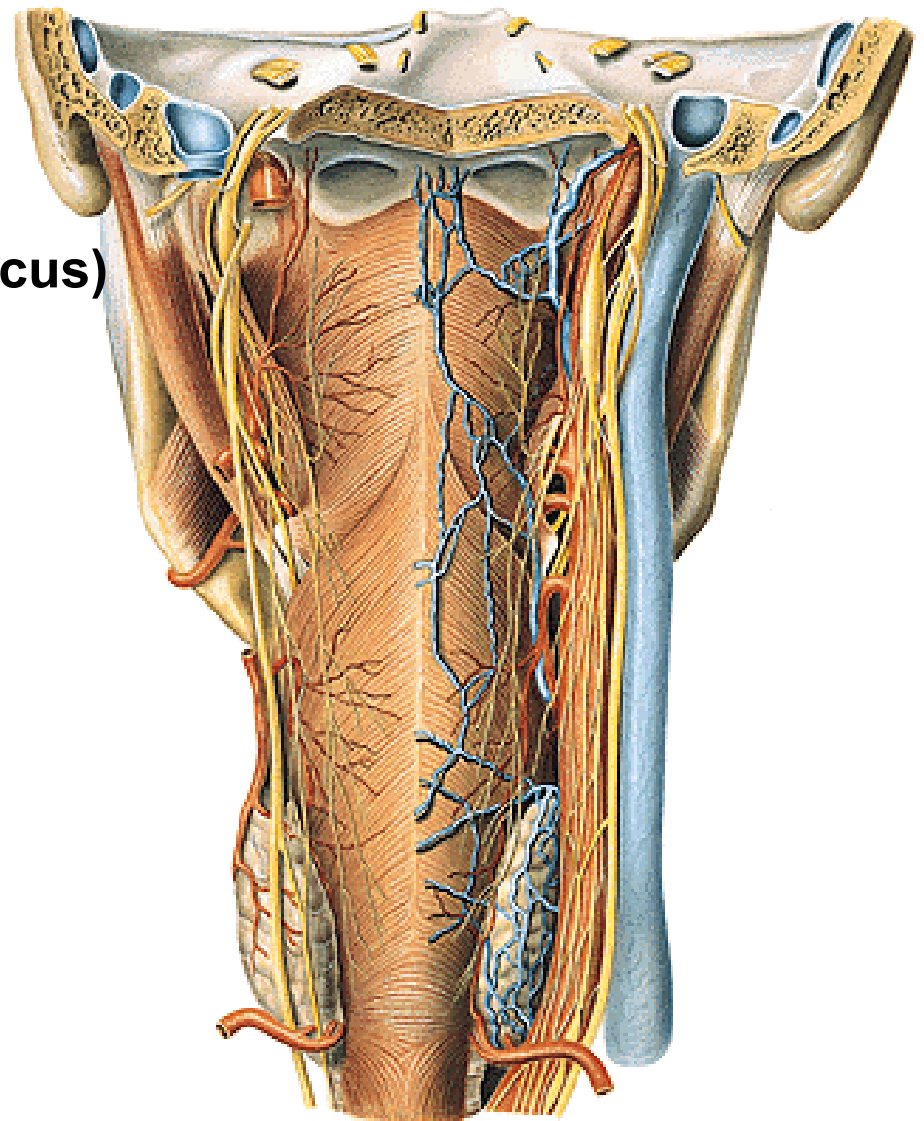
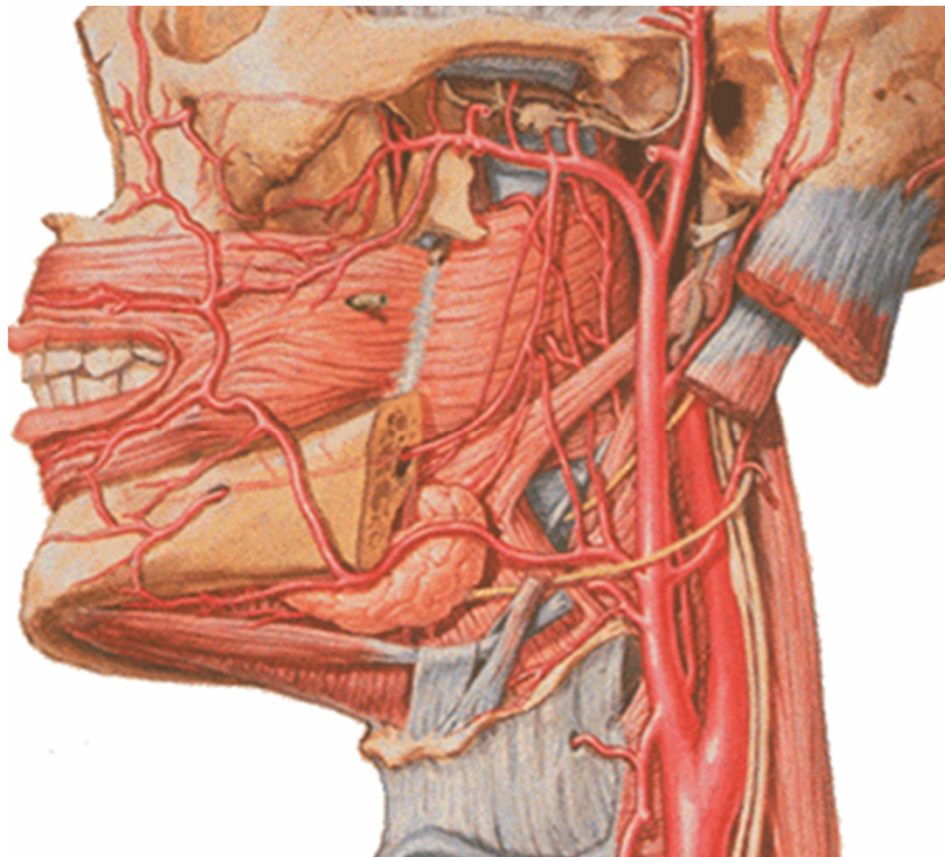


## ARTERIA PHARYNGEA ASC.

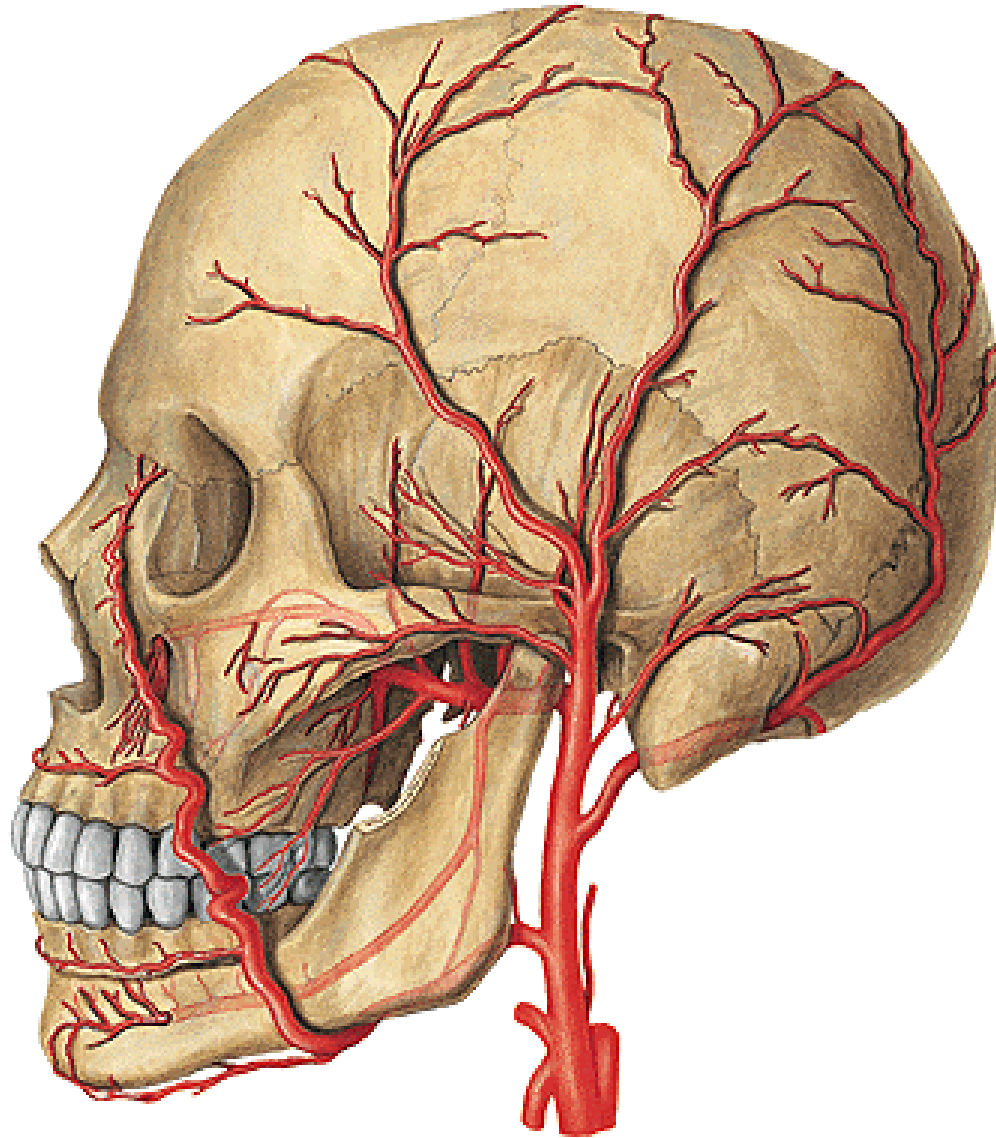
rr. pharyngei

a. meningea post. (foramen jugulare)

a. tympanica inf. (canaliculus tympanicus)



## ARTERIA OCCIPITALIS

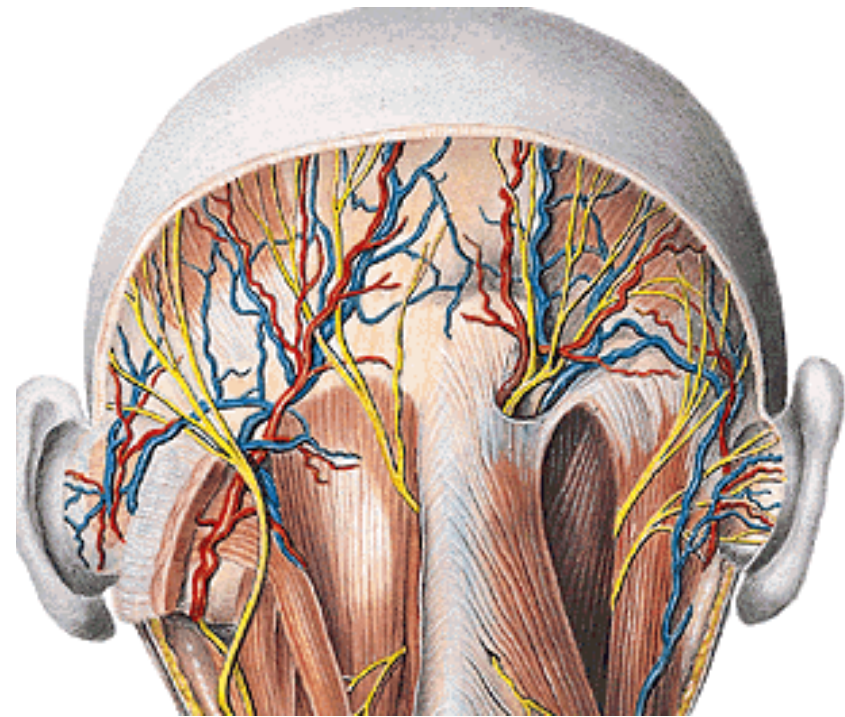


rr. musculares (r. sternocleidom.)

r. auricularis

r. mastoideus

rr. occipitales



## A. STERNOCLEIDOMASTOIDEA

### A. AURICULARIS POST.

rr. musculares

rr. glandulares

r. auricularis

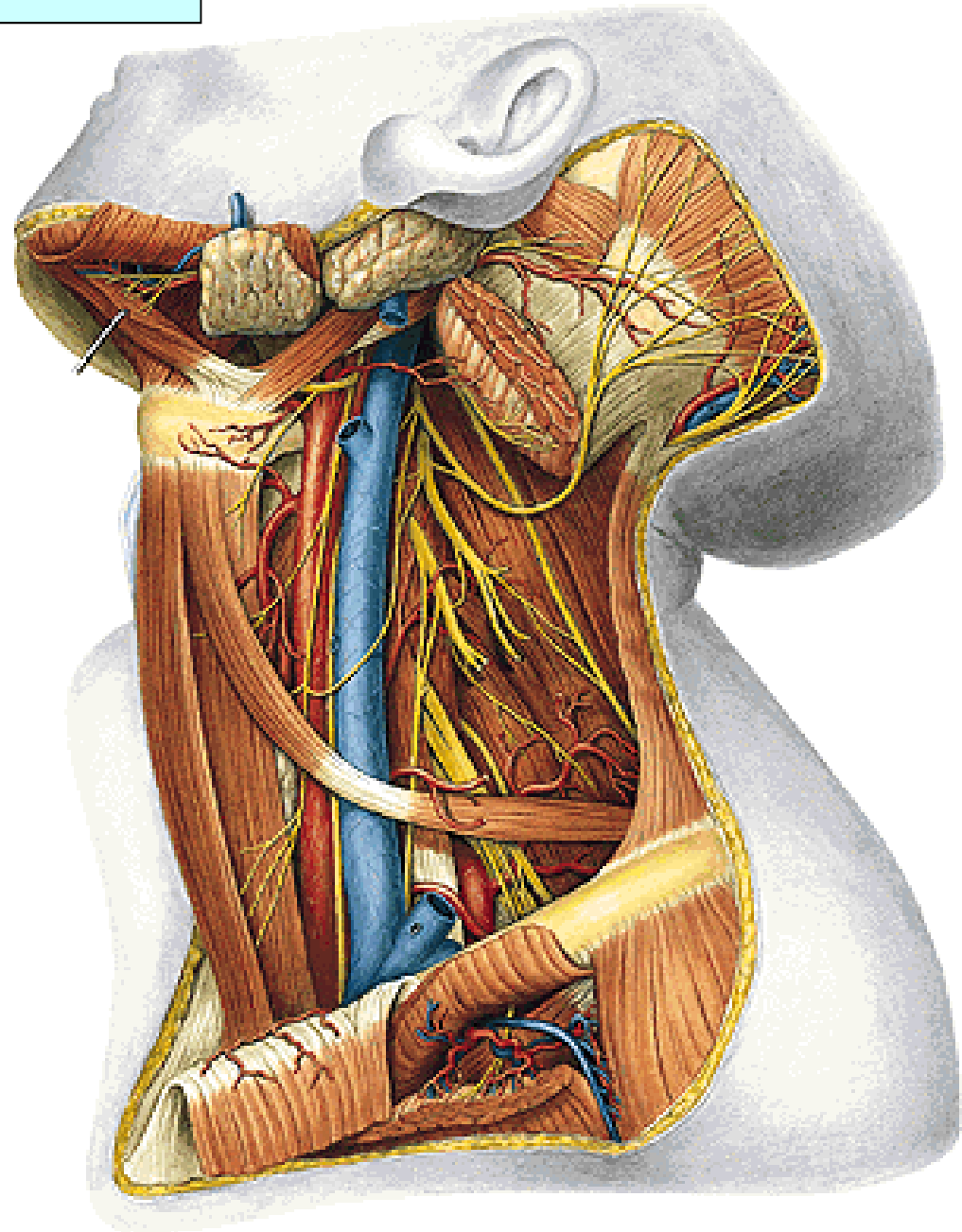
a. stylomastoidea

- a. tympanica post.

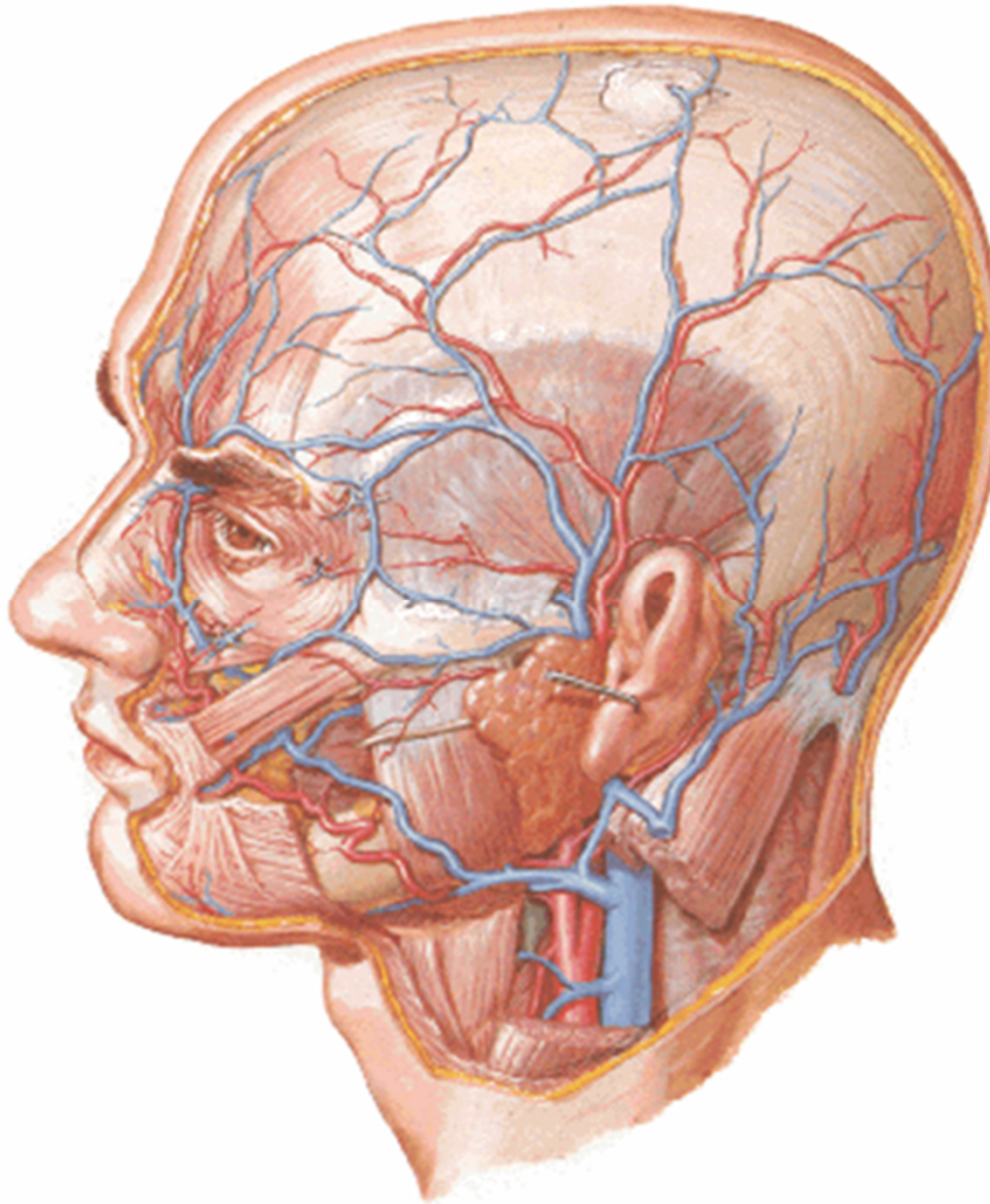
- rr. mastoidei

- r. stapedialis

r. occipitalis



# ARTERIA TEMPORALIS SUPERFICIALIS



**rr. parotidei**

**a. transversa faciei**

**rr. auriculares ant.**

**a. zygomaticoorbitalis**

**a. temporalis media**

**r. frontalis**

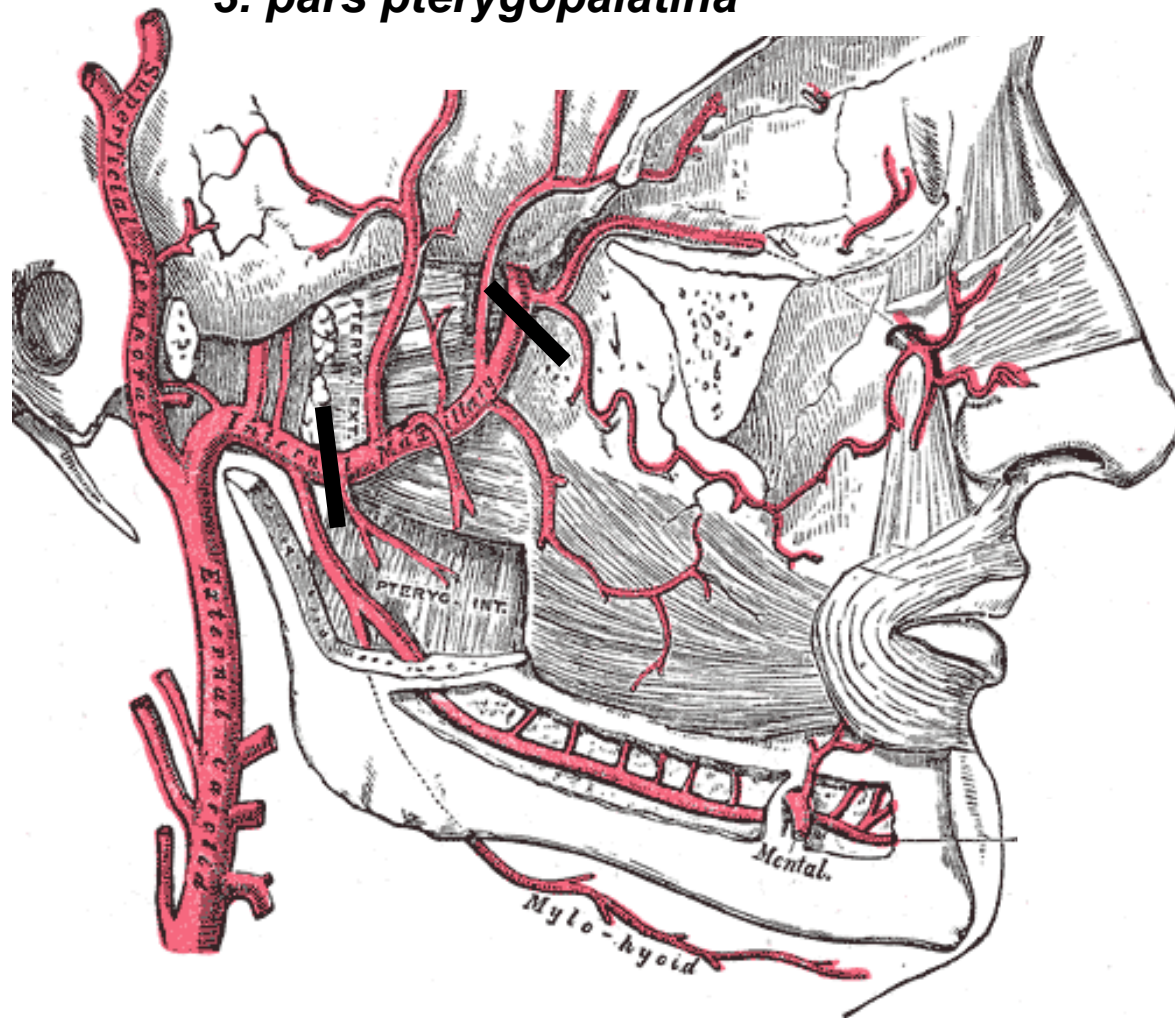
**r. parietalis**

# A. MAXILLARIS

1. *pars mandibularis*

2. *pars pterygoidea*

3. *pars pterygopalatina*



## *Pars mandibularis*

*a. meningea media*

*a. alveolaris inf.*

*r. mylohyoideus*

*rr. dentales*

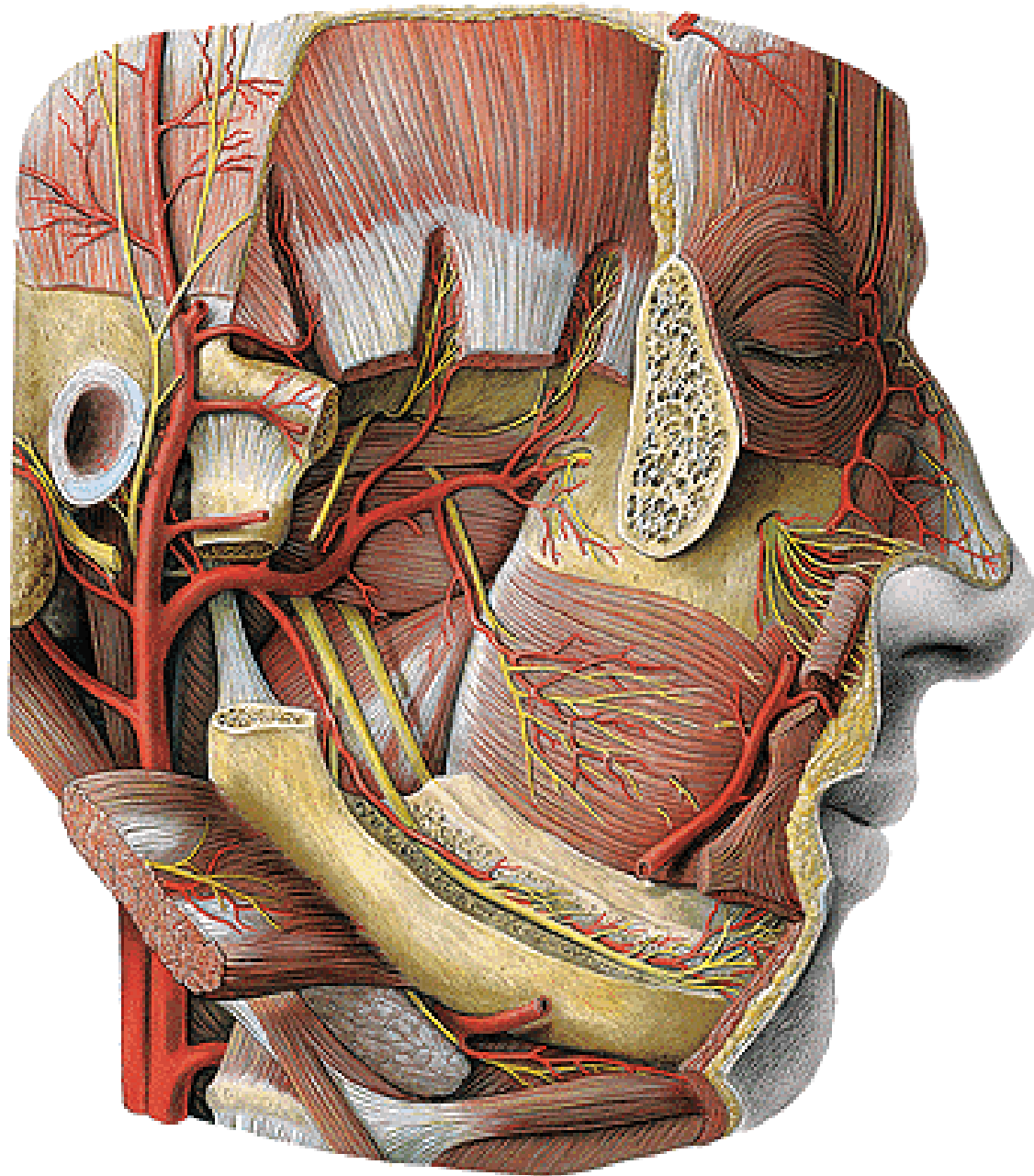
*rr. gingivales*

*a. mentalis*

*a. auricularis prof.*

*a. tympanica ant.*

## A. MAXILLARIS



### Pars pterygoidea

a. masseterica

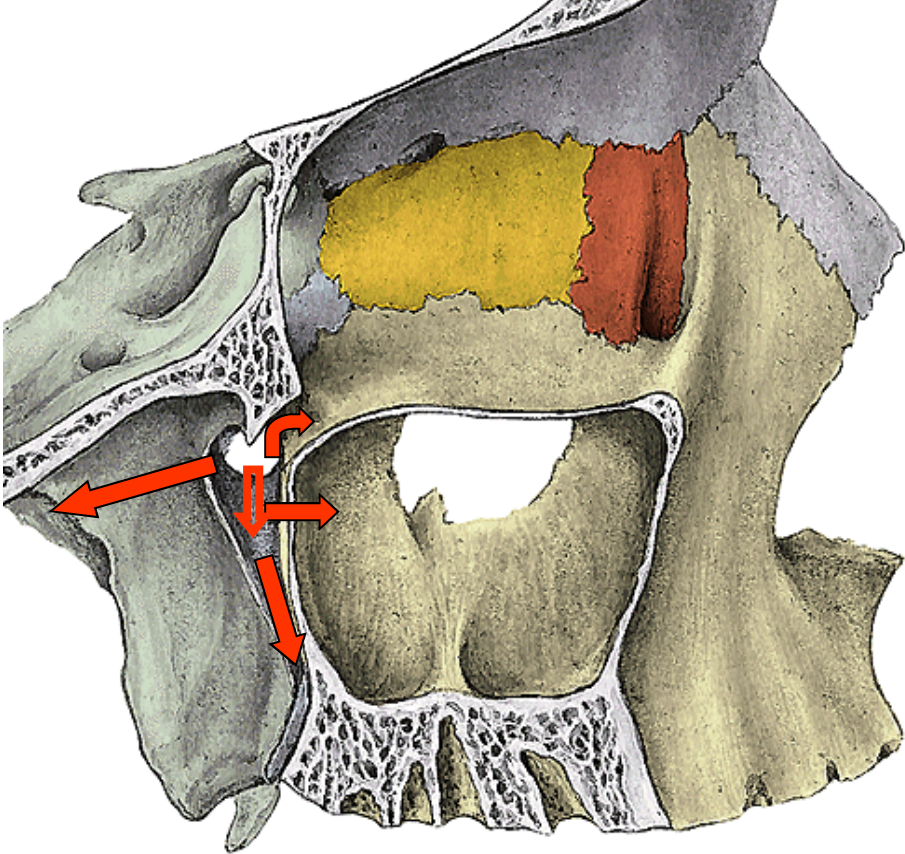
aa. temporales prof.

rr. pterygoidei

a. bucalis

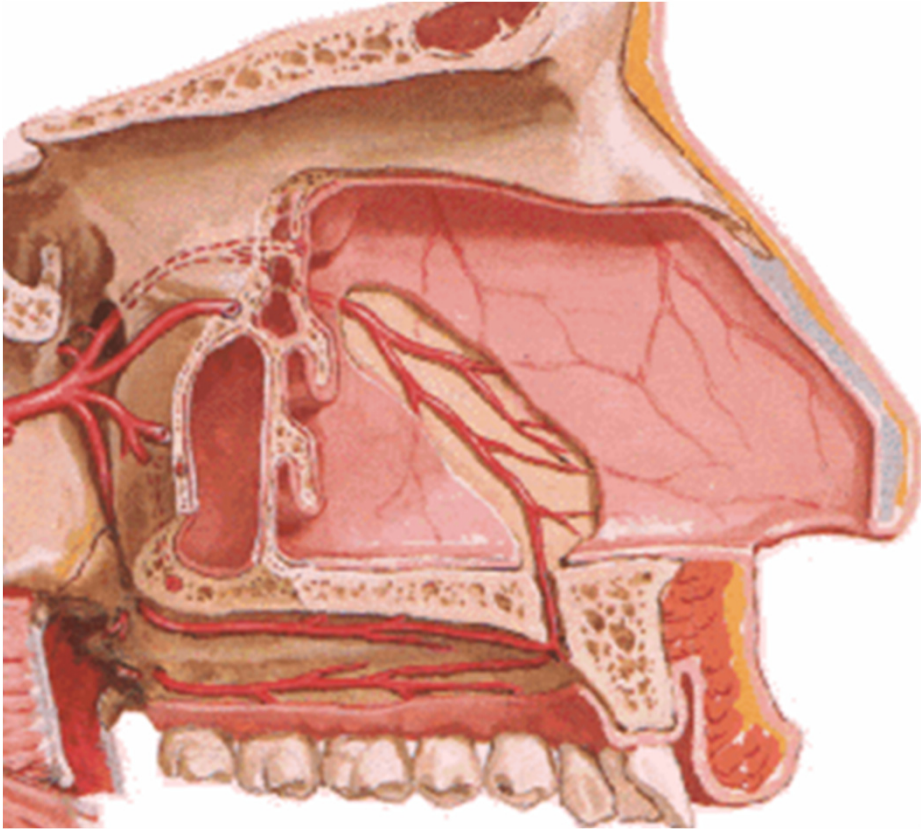


**A. MAXILLARIS - *pars pterygopalatina***



**a. infraorbitalis**

**a. alveolaris sup. post.**



**a. palatina descendens**

**a. canalis pterygoidei**

**a. sphenopalatina**

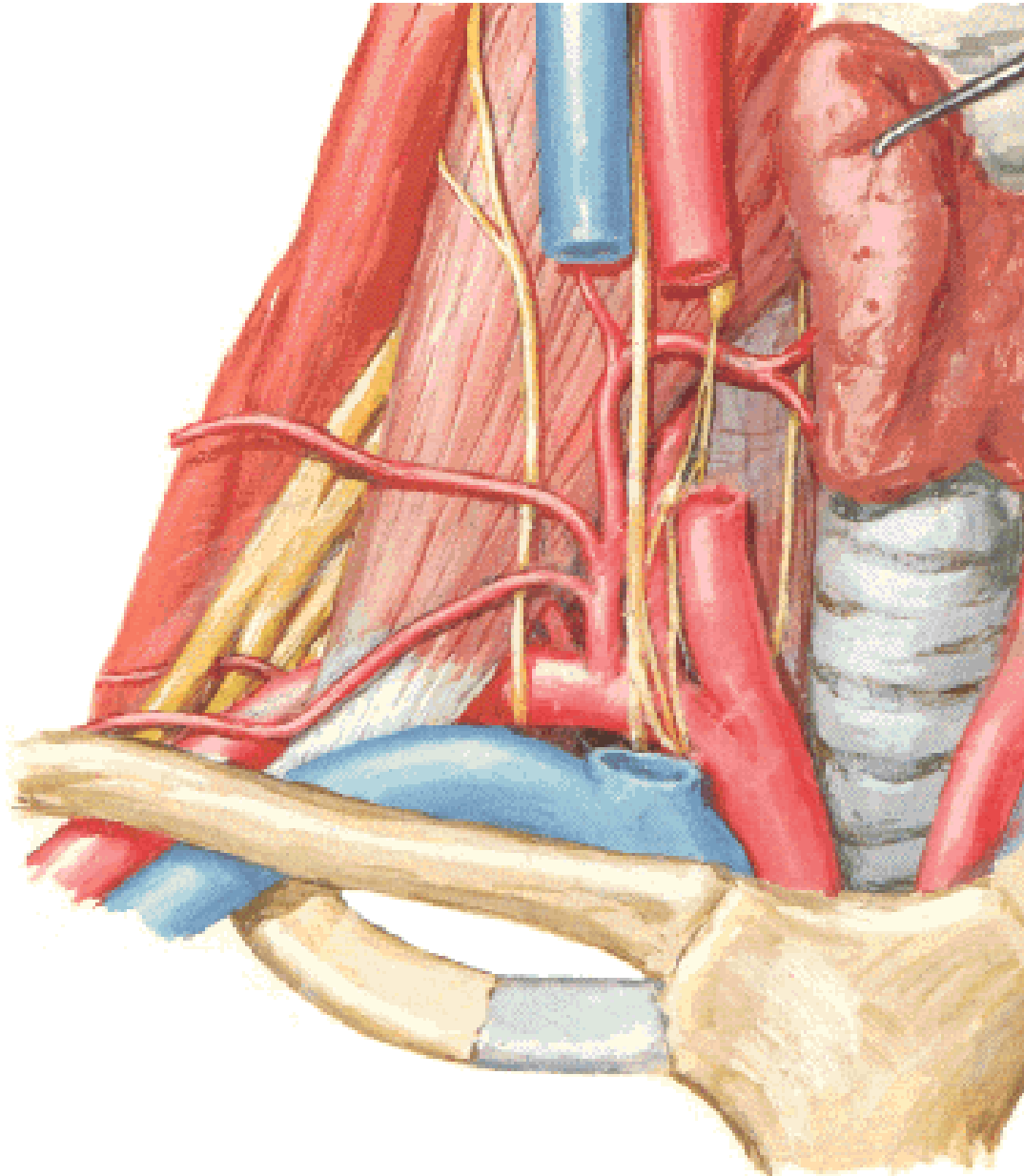
# ARTERIA SUBCLAVIA

**Fissura scalenorum**

**Sulcus a. subclaviae**

**cupula pleurae**

**costa prima**



# ARTERIA SUBCLAVIA

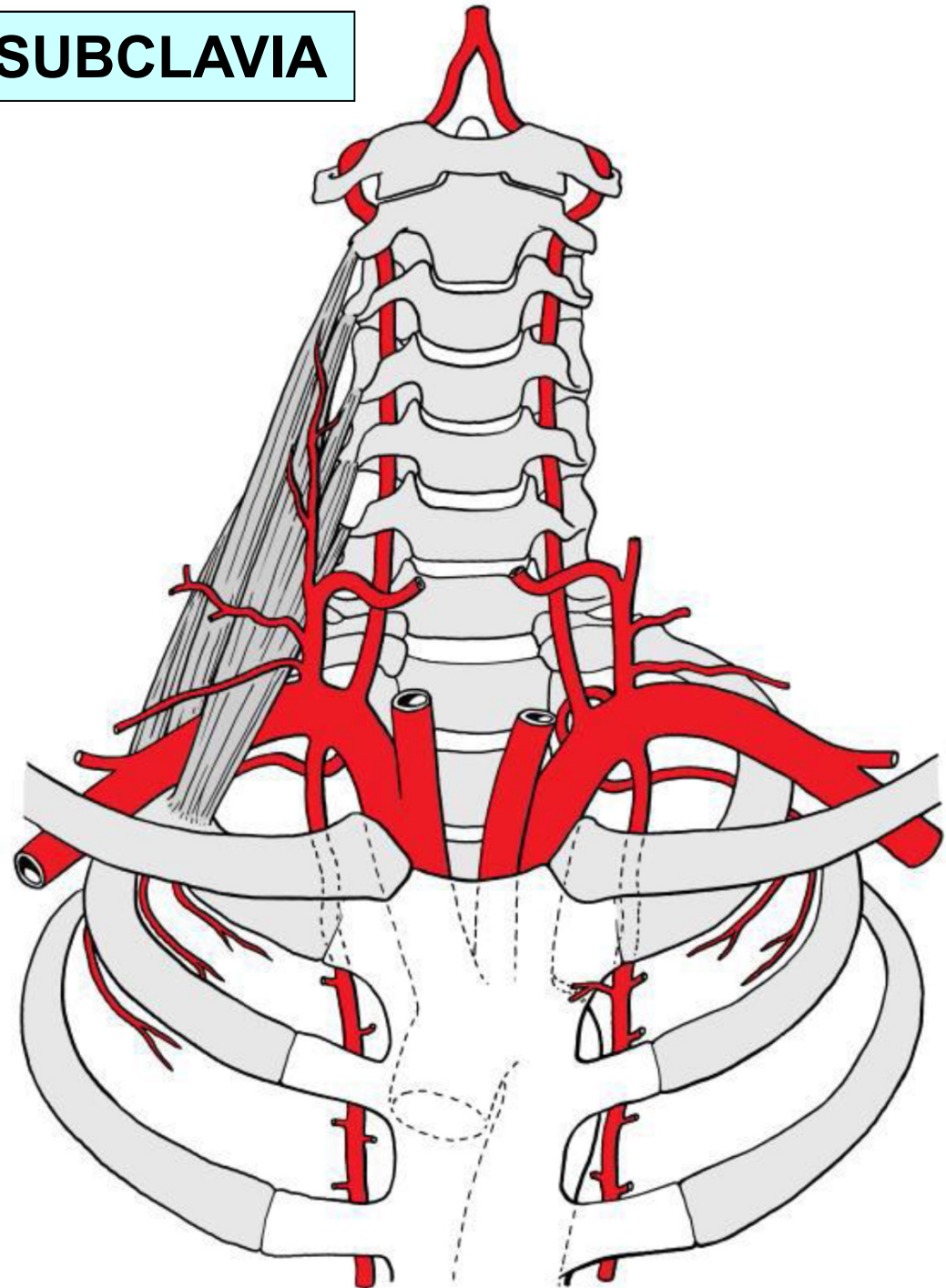
**a. vertebralis**

**a. thoracica interna**

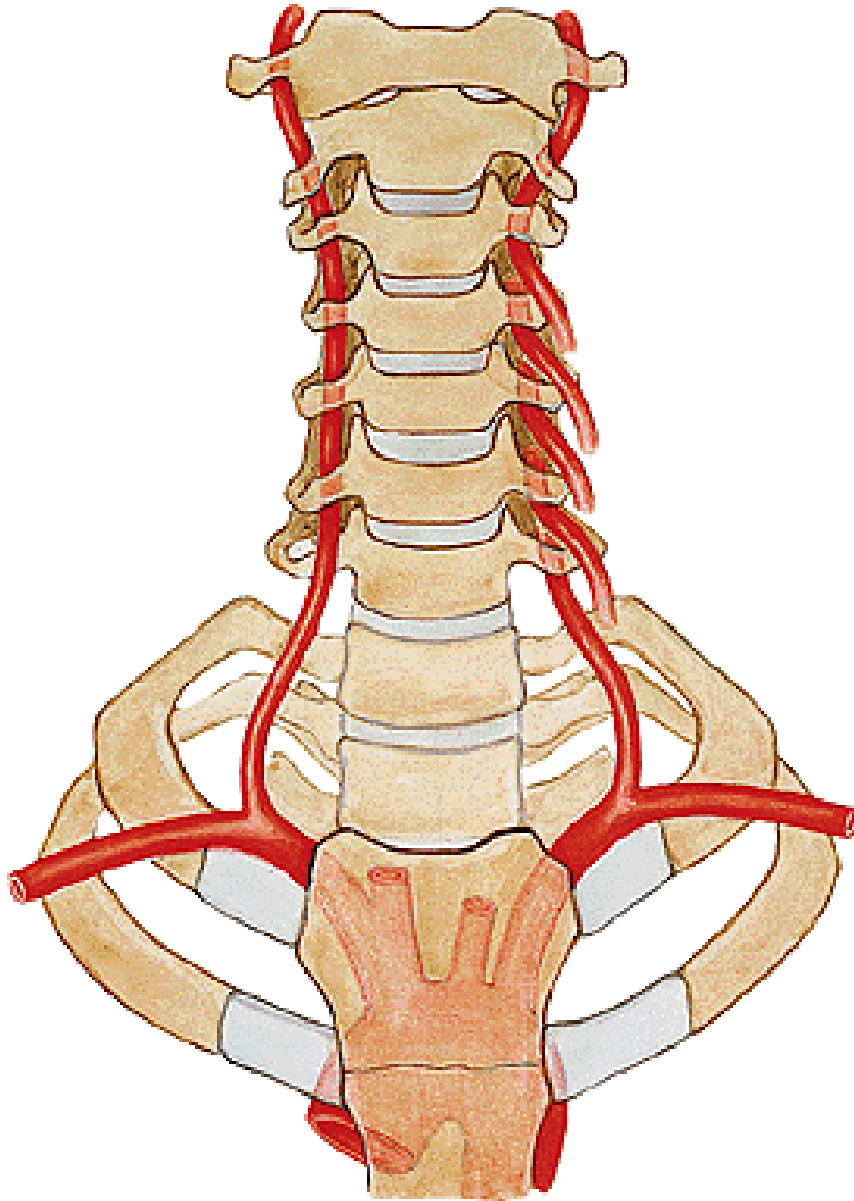
**tr. thyreocervicalis**

**tr. costocervicalis**

**a. transversa colli**



# ARTERIA VERTEBRALIS

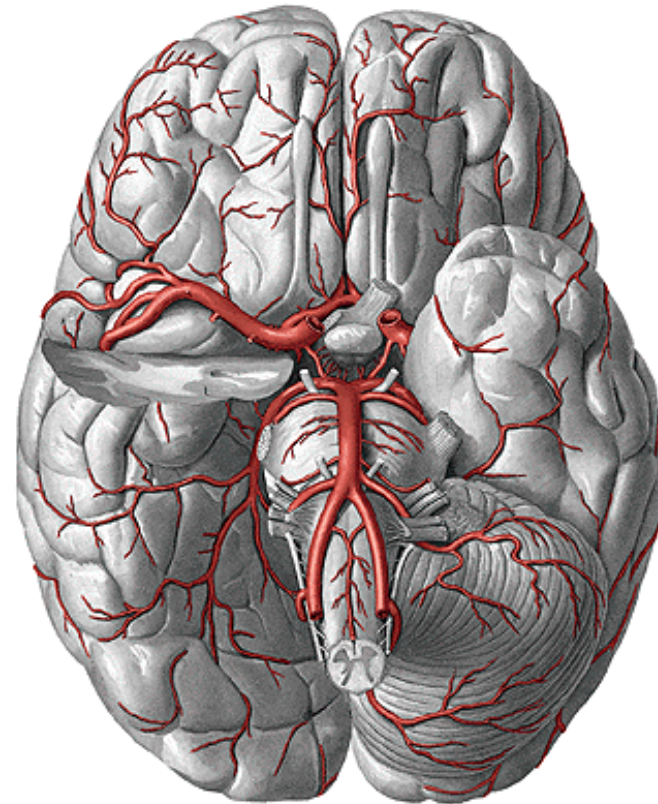


**rr. spinales**

**rr. musculares**

**a. basilaris**

**aa. cerebri post.**



## ARTERIA THORACICA INTERNA

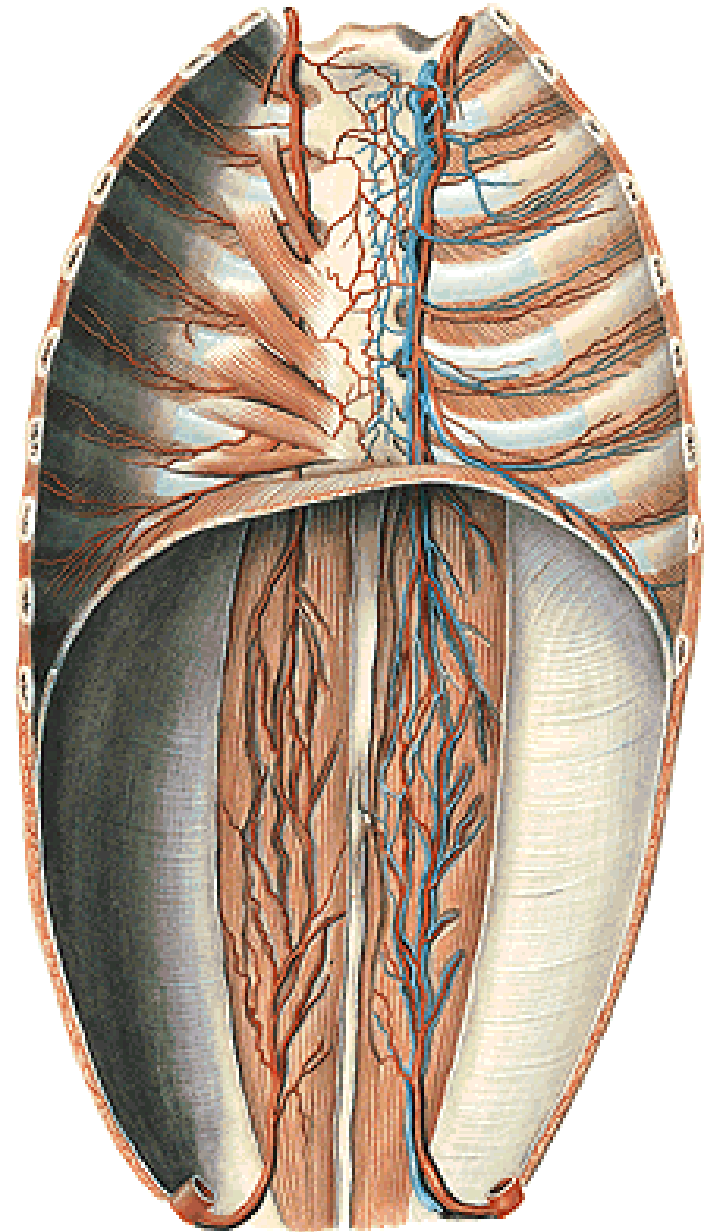
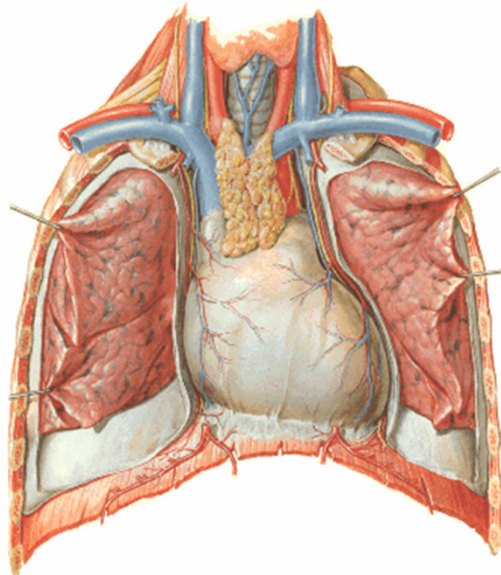
a. musculophrenica

a. epigastrica sup.

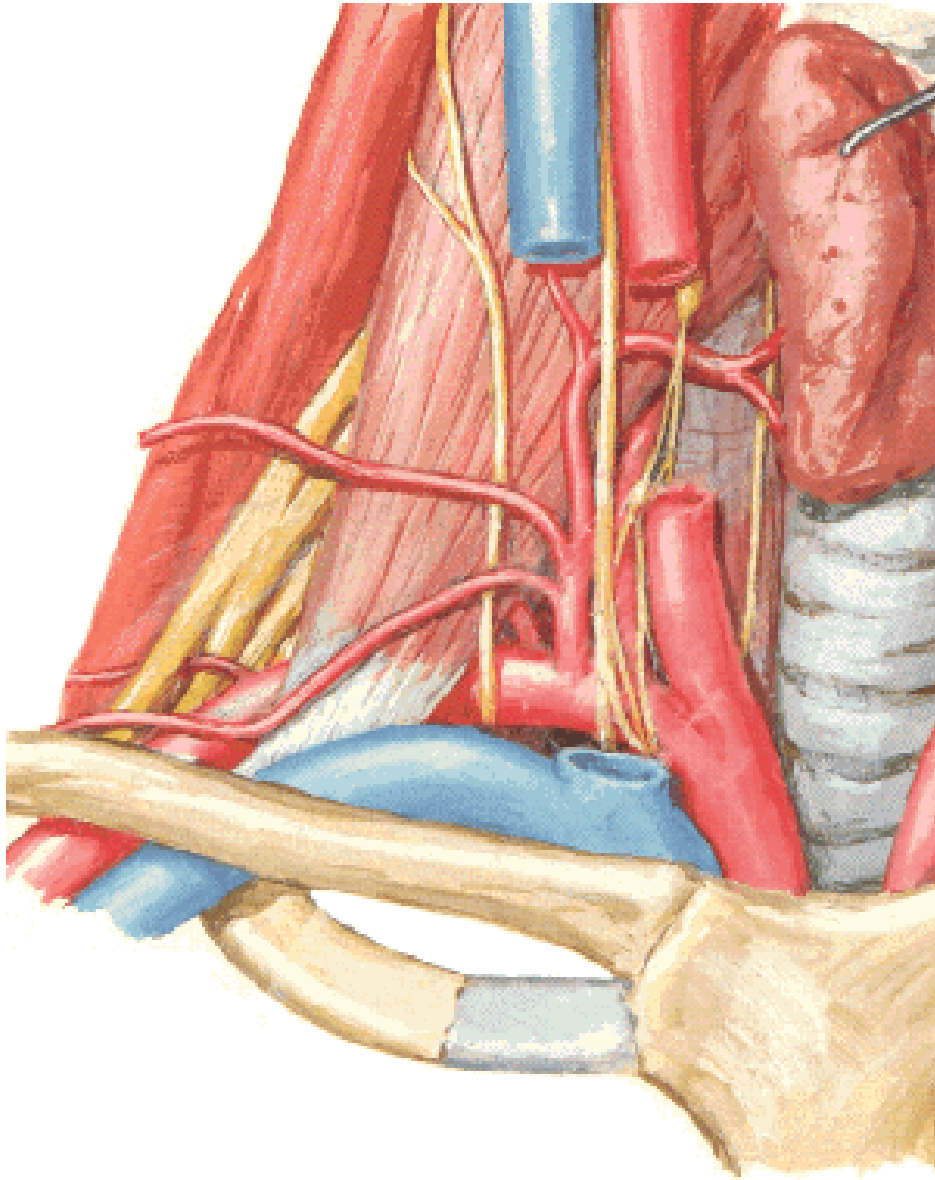
aa. intercostales ant.  
(rr. perforantes, rr. mammarii)

a. pericardiophrenica

rr. mediastinales  
(aa. thymicae, rr. bronchiales, rr. sternales)



## TRUNCUS THYREOCERVICALIS

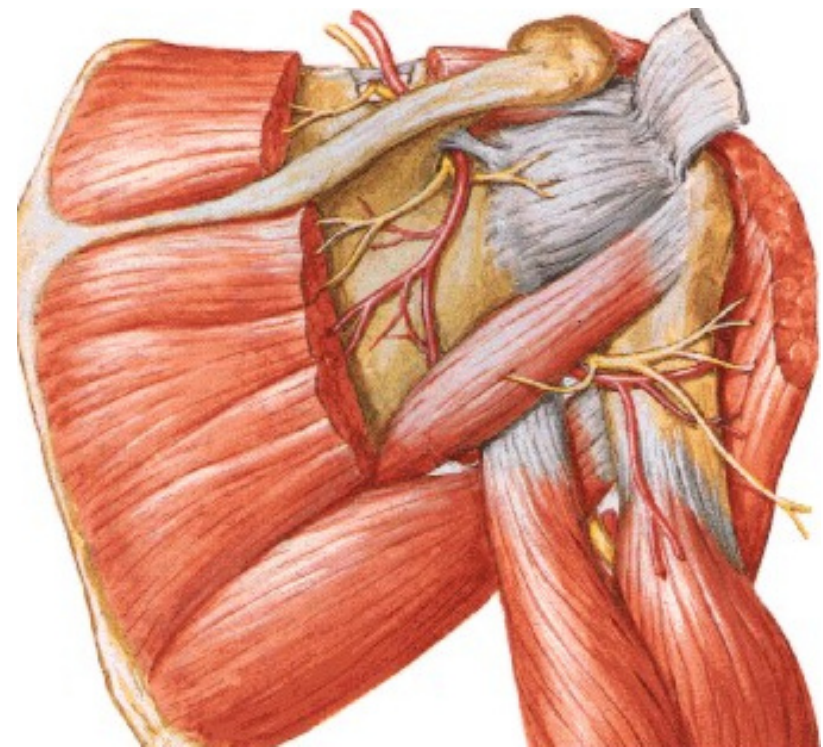


a. thyroidea inf.

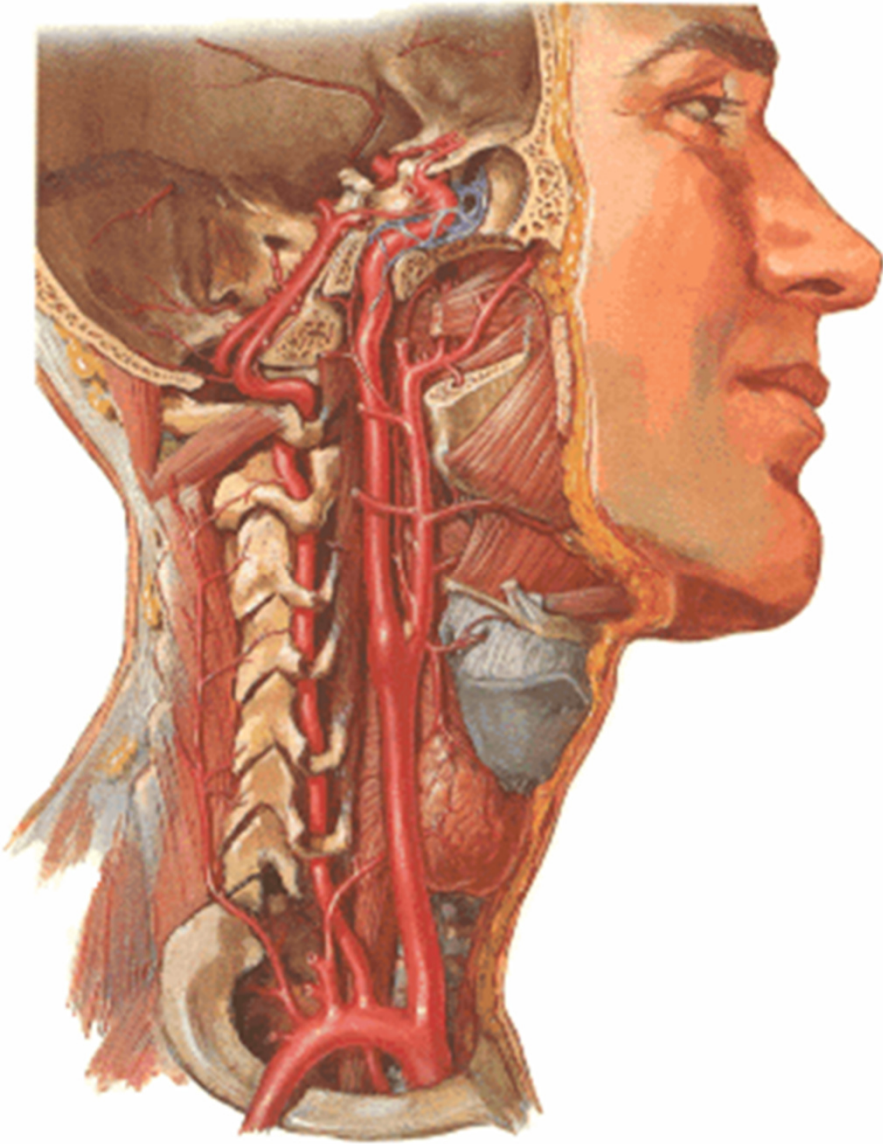
a. cervicalis ascendens

a. cervicalis spf.

a. suprascapularis

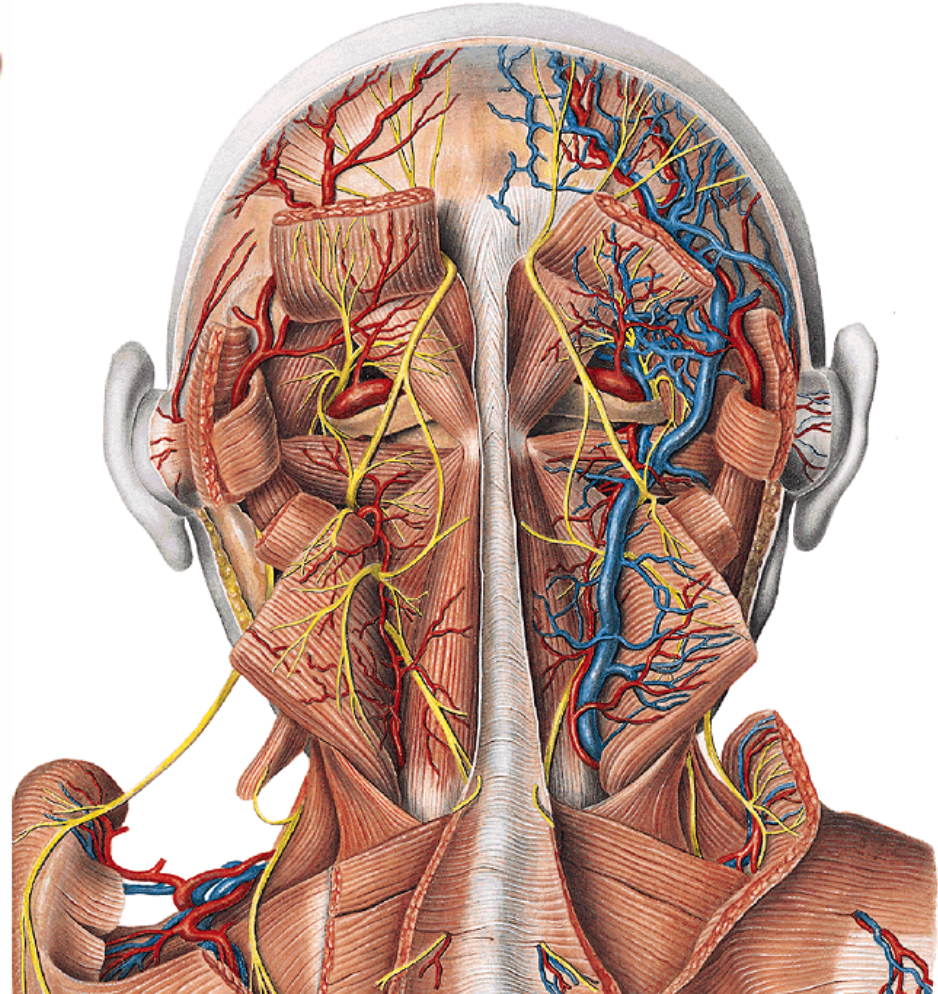


# TRUNCUS COSTOCERVICALIS

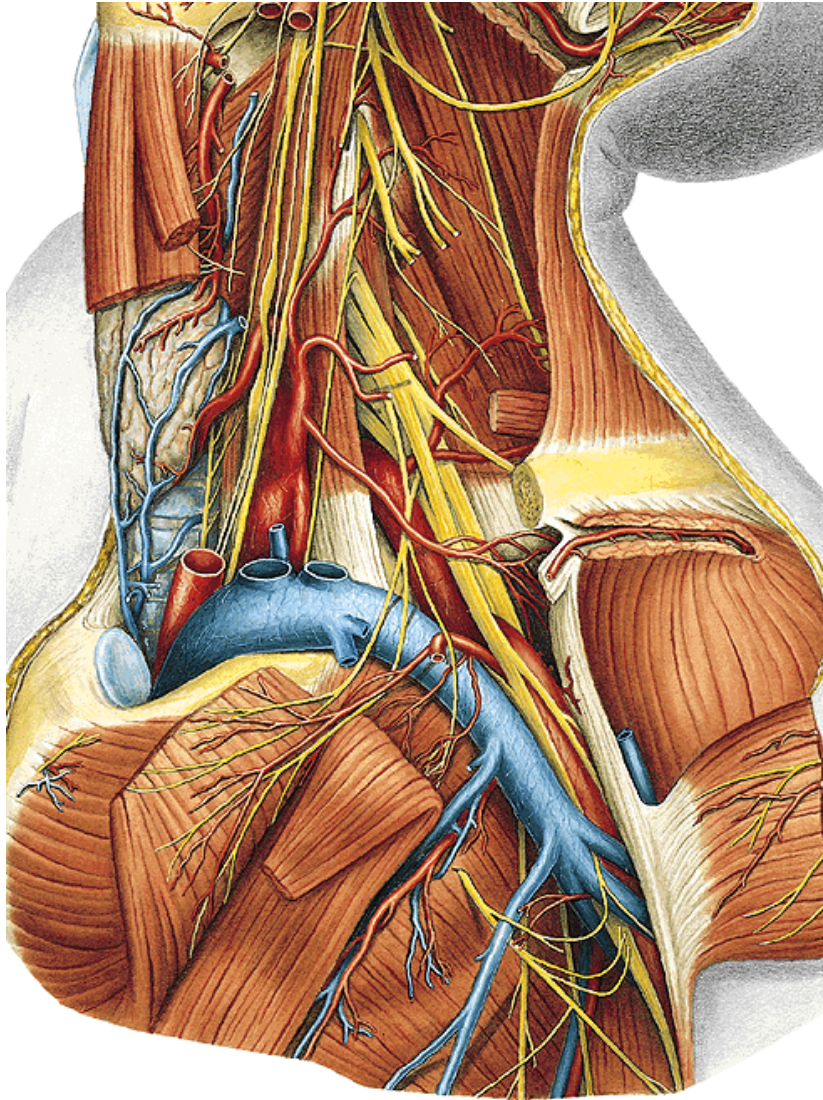


a. cervicalis prof.

a. intercostalis suprema

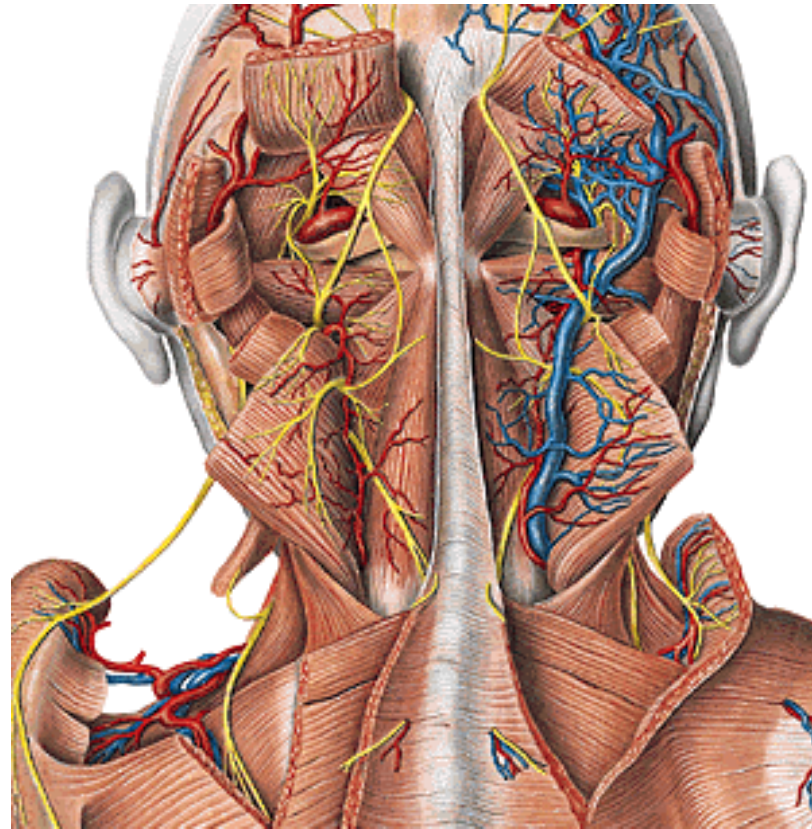


## ARTERIA TRANSVERSA COLLI



**r. ascendens (superficialis)**

**r. descendens (profundus)  
= a. dorsalis scapulae**





## **Použité materiály**

**Čihák, R.: Anatomie 3. Praha, Grada, 2001, 2004**

**Sobotta, J.: Atlas of Human Anatomy Vol 1–2 Munich, Urban und Schwarzenberg, 1993**

**Williams, P. & Warwick, R.: Gray's Anatomy, 37 ed, Churchill Livingstone, 1996**

**Netter, F.: Atlas of Human Anatomy, 4th ed., Elsevier, USA, 2006**