

SPINE

Chapter 4

New Terminology

Combining Form	Meaning	Example	Meaning of New Term
Arthr/o	Joint	Arthrocentesis	Surgical puncture of a joint
Articul/o	Joint	Articular	Pertaining to a joint
Cervic/o	Neck	Cervicodynia	Pain of the neck
Chondr/o	Cartilage	Chondrodysplasia	Bad, painful or difficult formation or growth of cartilage
Cost/o	Ribs	Costochondritis	Inflammation of the ribs and cartilage
Crani/o	Cranium	Craniocerebral	Pertaining to the ₂ cranium and brain

New Terminology

Combining Form	Meaning	Example	Meaning of New Term
Kinesi/o	Movement	Kinesiology	Study of movement
Kyph/o	Hump	Kyphosis	Abnormal condition of a hump
Lamin/o	Lamina	Laminectomy	Excision or surgical removal of a lamina
Lord/o	Bend backward	Lordoscoliosis	Abnormal condition of crookedness and backward bend
Lumb/o	Lower back	Lumbodynia	Pain of the lower back

New Terminology

Combining Form	Meaning	Example	Meaning of New Term
Muscul/o	Muscle	Musculoskeletal	Pertaining to the muscles and skeleton
My/o	Muscle	Myocardial	Pertaining to the heart muscle
Myel/o	Spinal cord Bone marrow	Myeloplegia	Paralysis of the spinal cord
Ortho/o	Straight	Orthopnea	Breathing in the straight position
Oste/o	Bone	Osteolytic	Pertaining to the destruction of bone
Sacr/o	Sacrum	Sacrodynia	Pain of the sacrum ₄

New Terminology

Combining Form	Meaning	Example	Meaning of New Term
Scoli/o	Crooked, bent	Scoliometer	Measuring instrument for crookedness
Spondyl/o	Vertebrae	Spondylomalacia	Softening of a vertebrae
Vertebr/o	Vertebrae	Vertebroplasty	Surgical repair of a vertebra
Stern/o	Sternum	Sternocostal	Pertaining to the sternum and ribs
Sthen/o	Strength	Myasthenia	Condition of absence of muscle strength
Thorac/o	Thorax	Thoracolumbar	Pertaining to the thorax and lower back ⁵

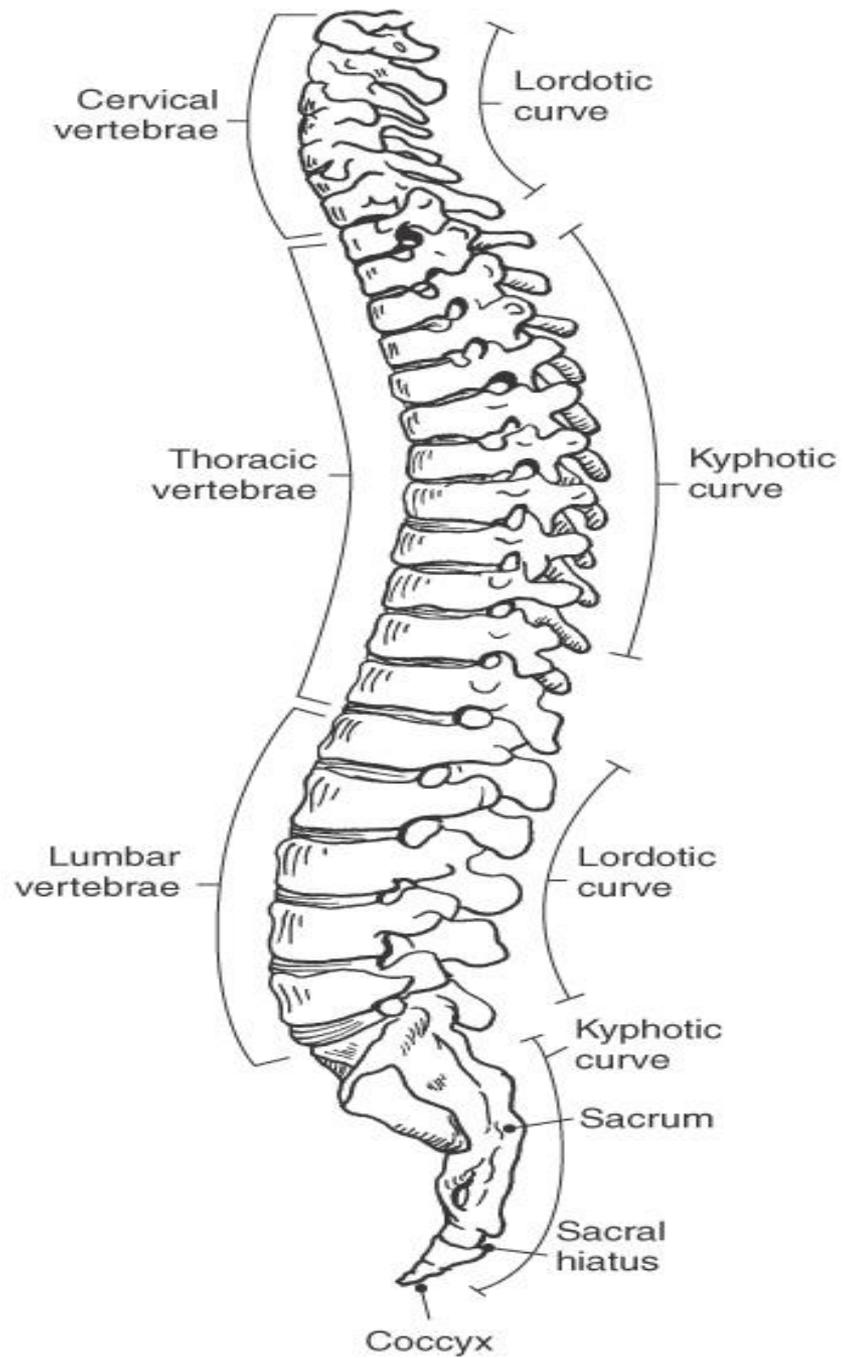
Vertebral Column

- **Supports weight of body**
- **Helps maintain posture**
- **Protects spinal cord/nerves**

Vertebral Column

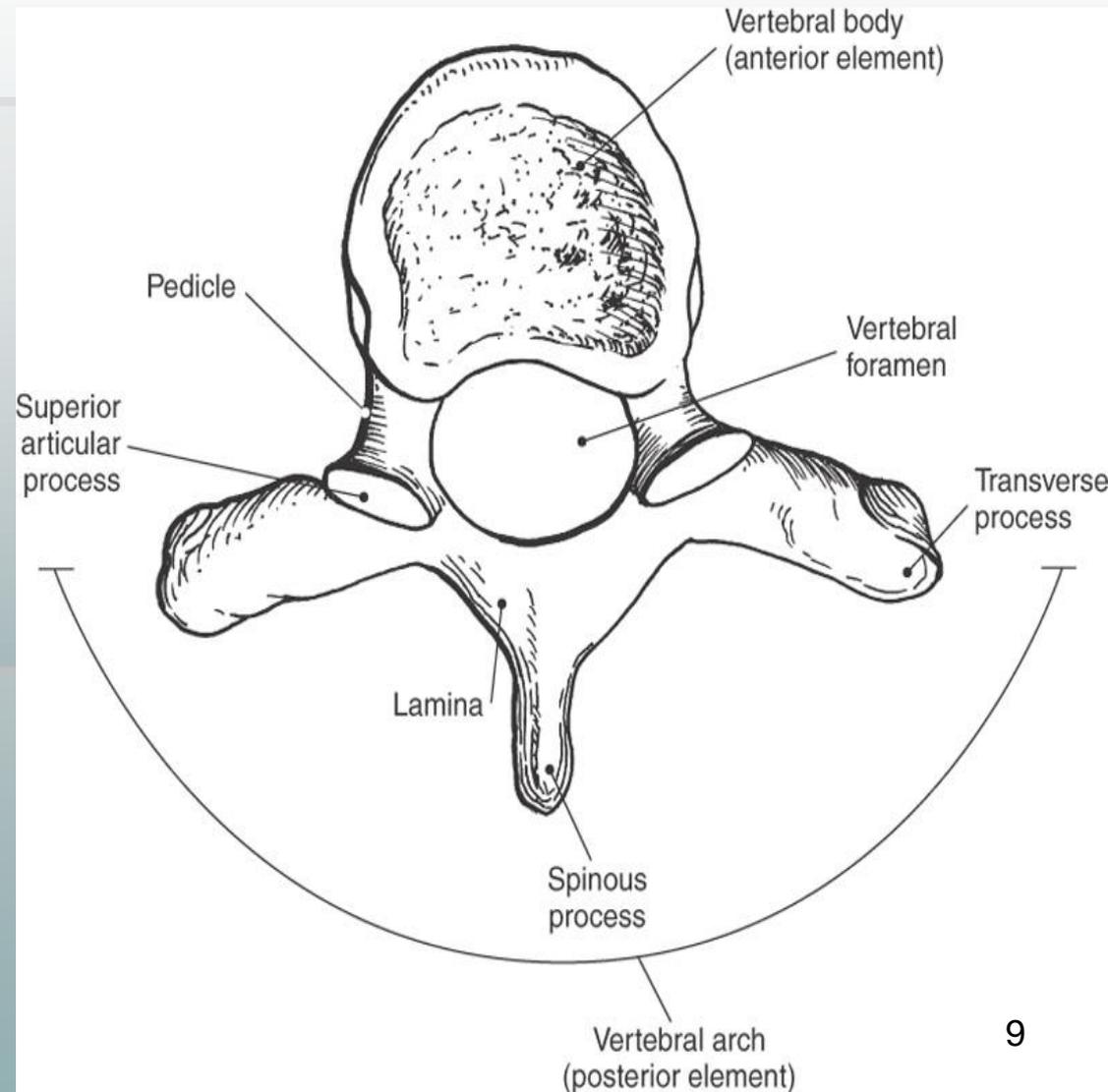
- **33 Vertebrae**

- **Cervical (7) Lordotic**
- **Thoracic (12) Kyphotic**
- **Lumbar (5) Lordotic**
- **Sacral (5) Kyphotic**
- **Coccygeal (4) Kyphotic**



Vertebrae

- Consists of:
 - Body
 - Anterior
 - Vertebral Arch
 - Posterior

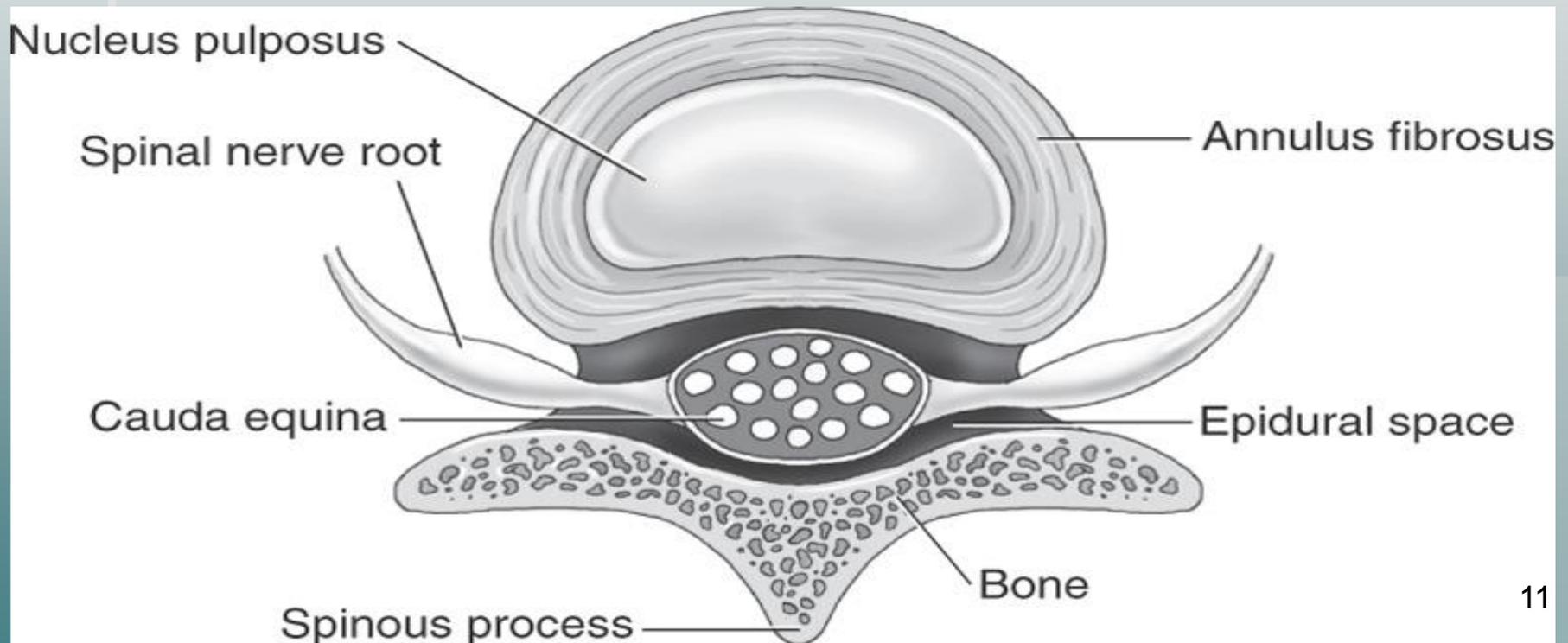


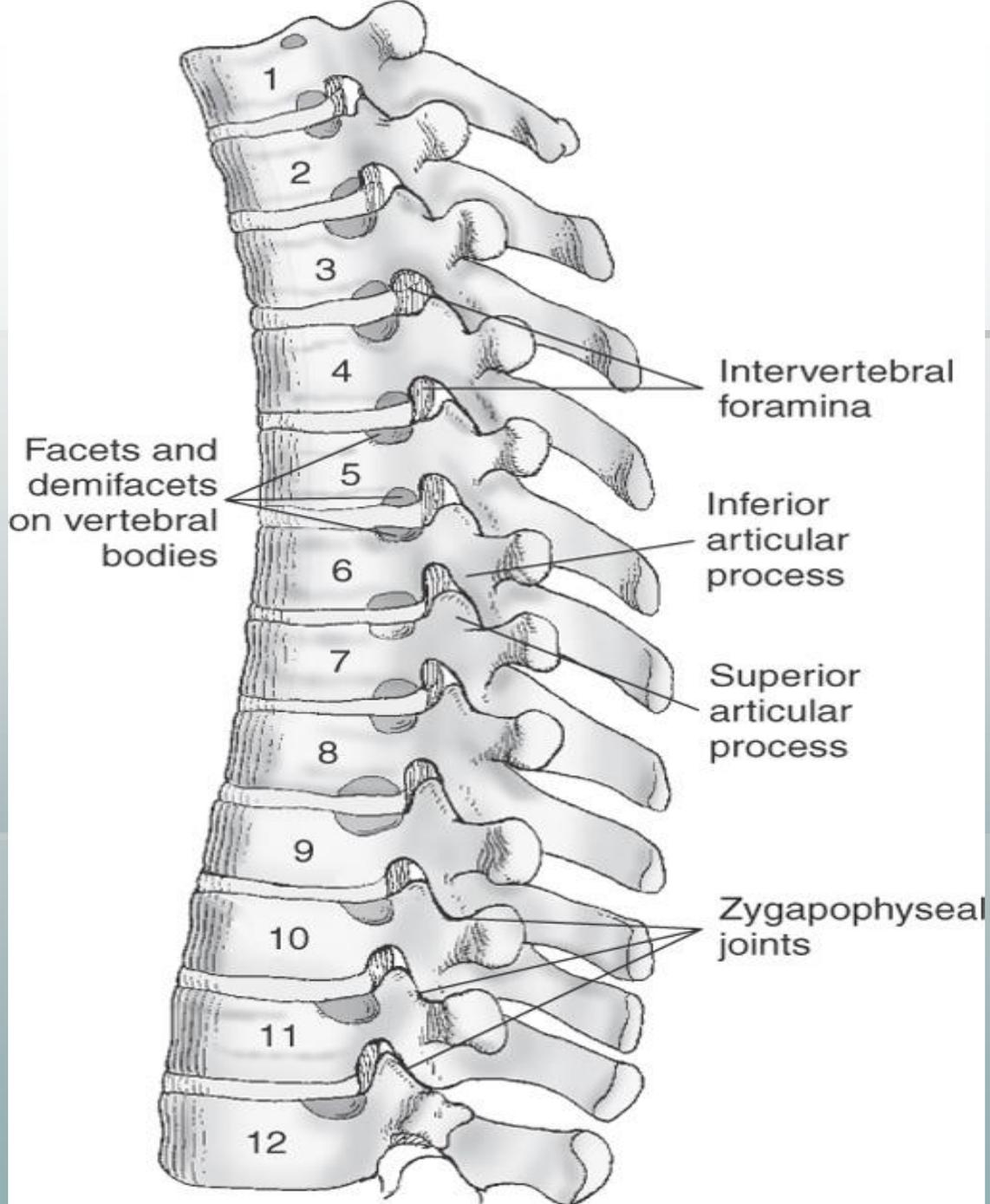
Vertebral Arch

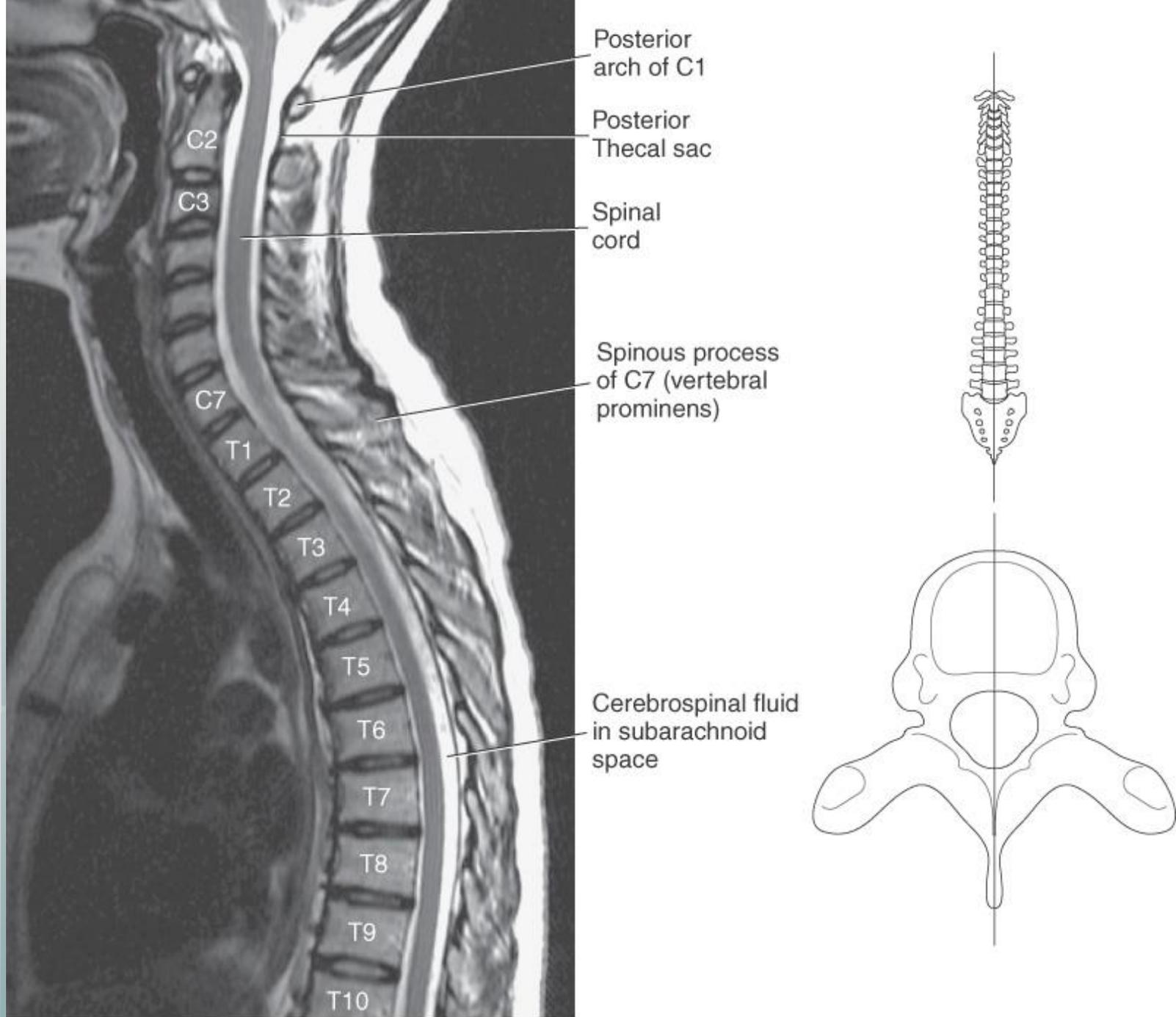
- **Formed by**
 - **2 Pedicles**
 - **2 Laminae**
 - **1 Spinous Process**
 - **2 Transverse Processes**

Intervertebral Disks

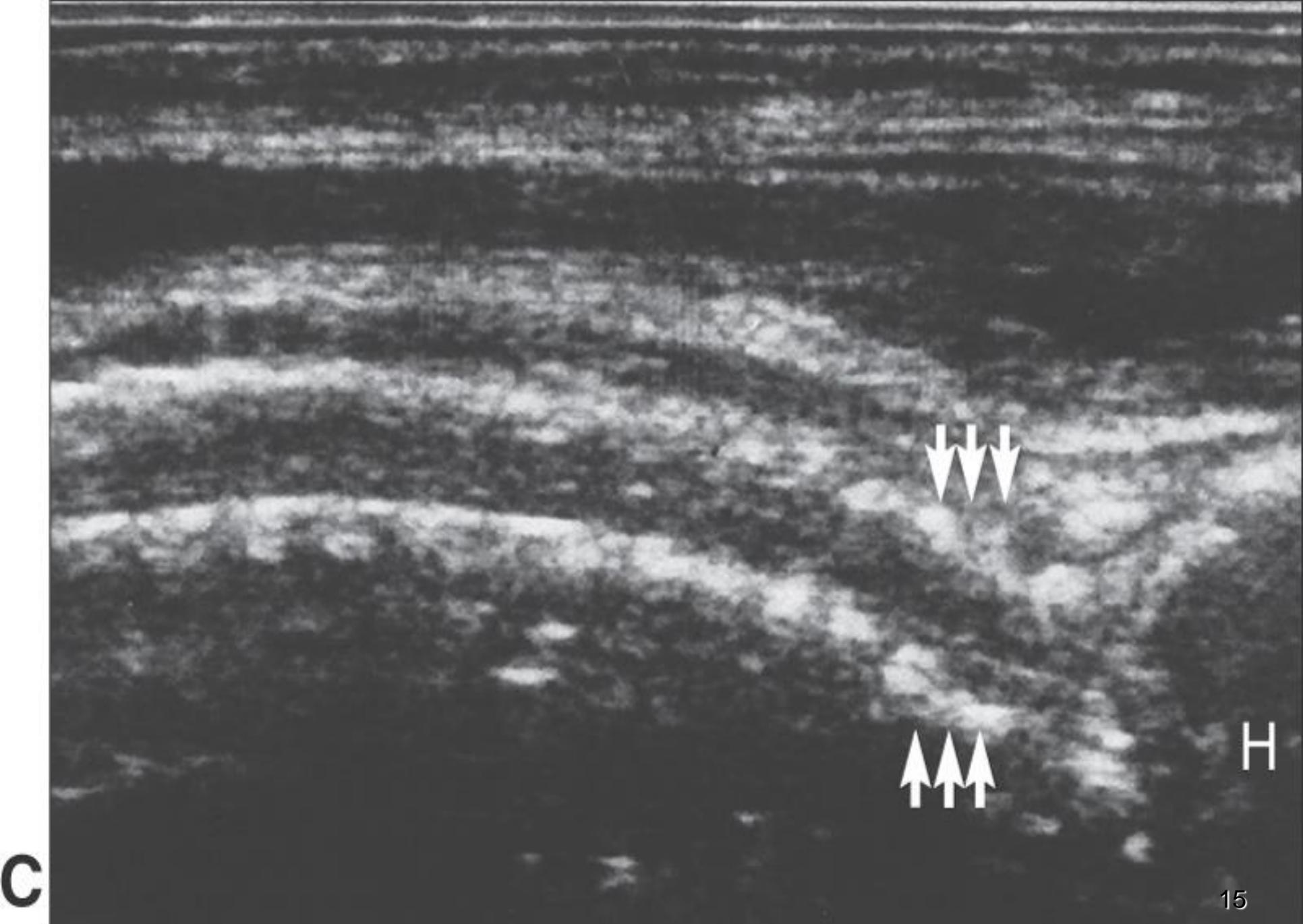
- Separates the vertebral bodies
- Shock-absorbing cartilage







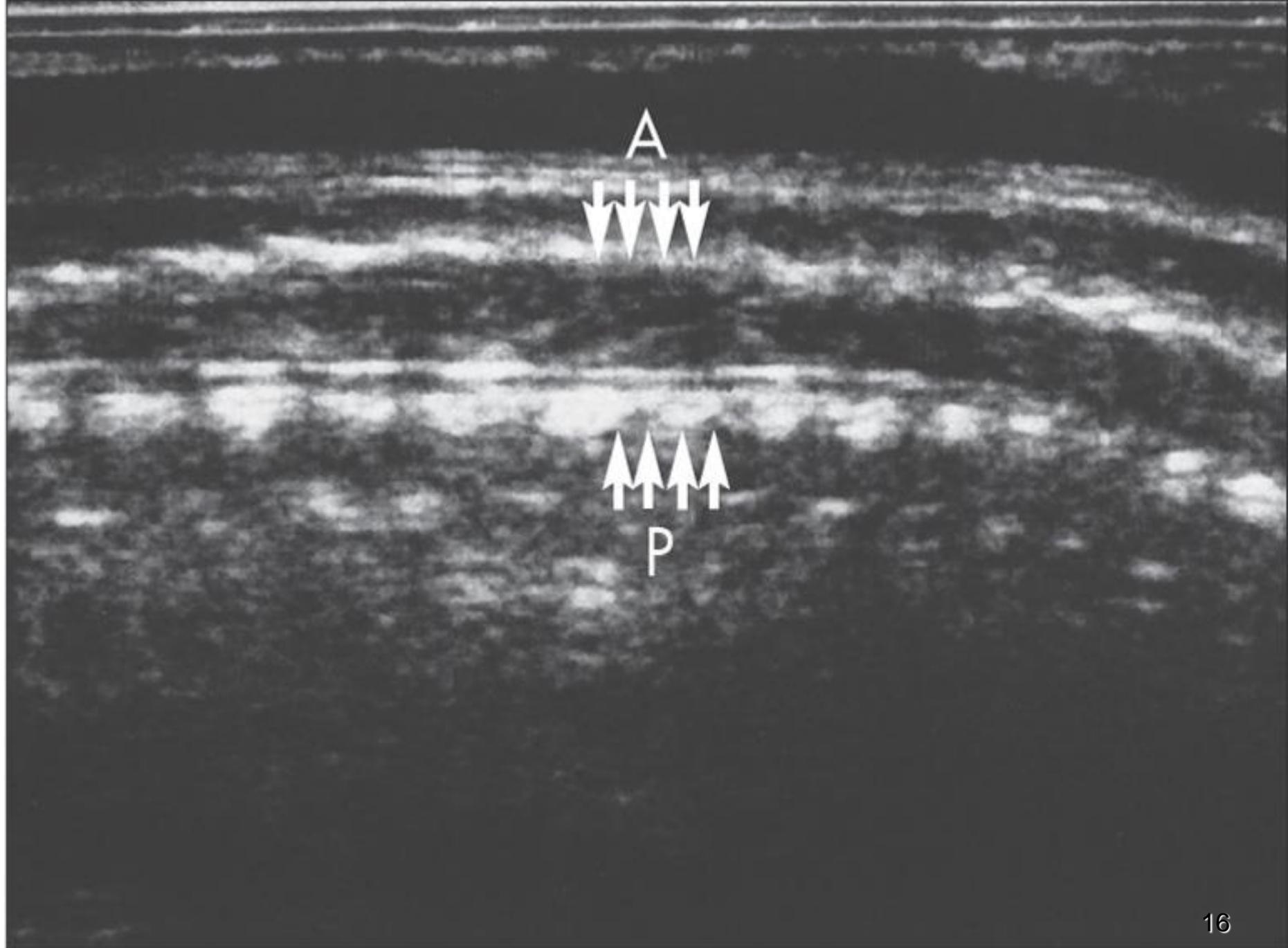
Longitudinal Images



C

H

B



SACRUM



A



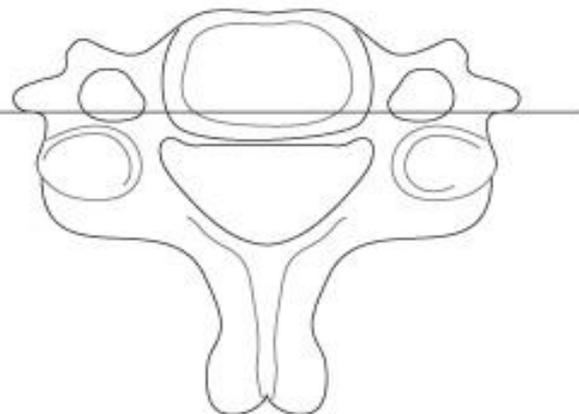
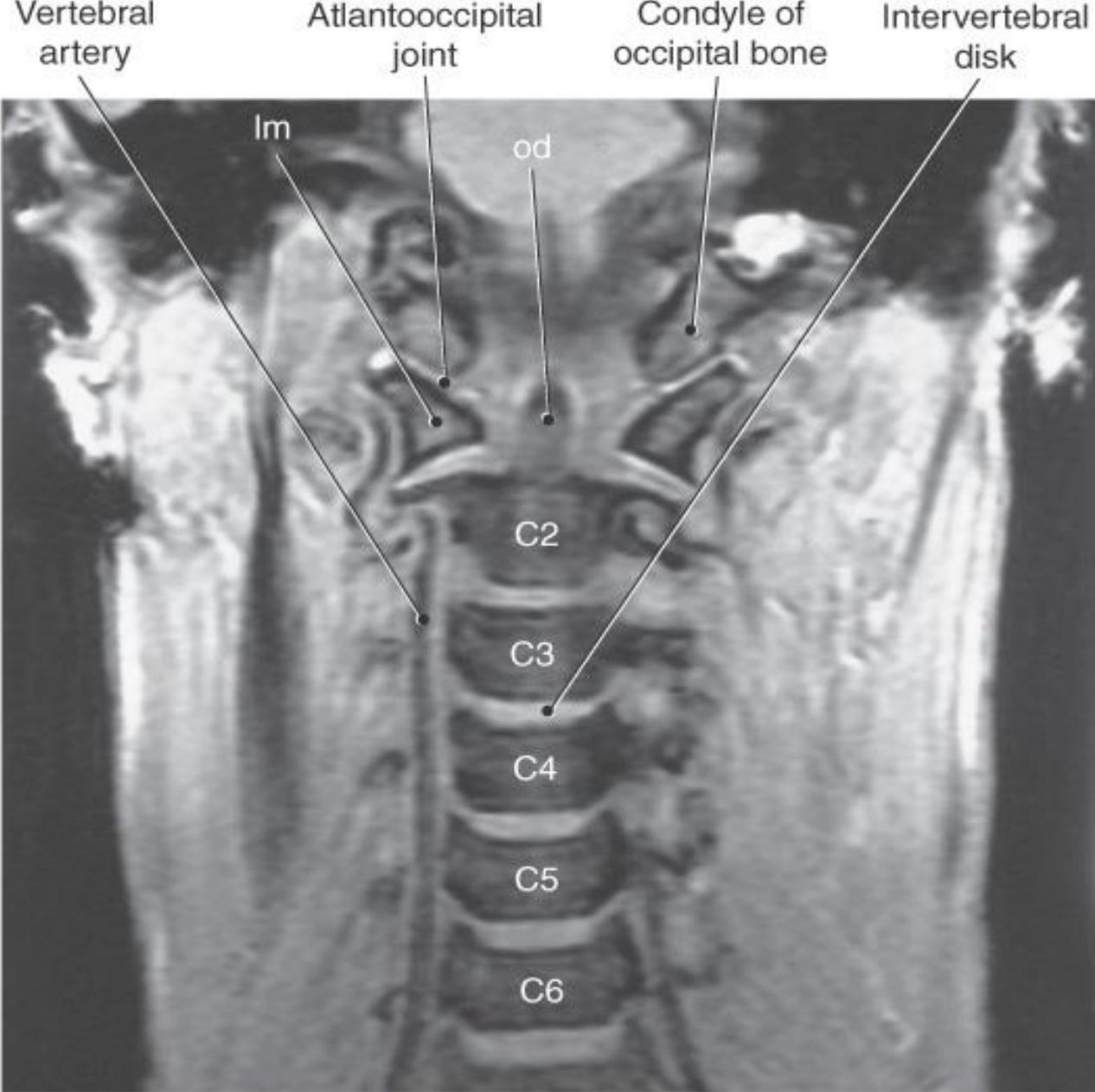
C



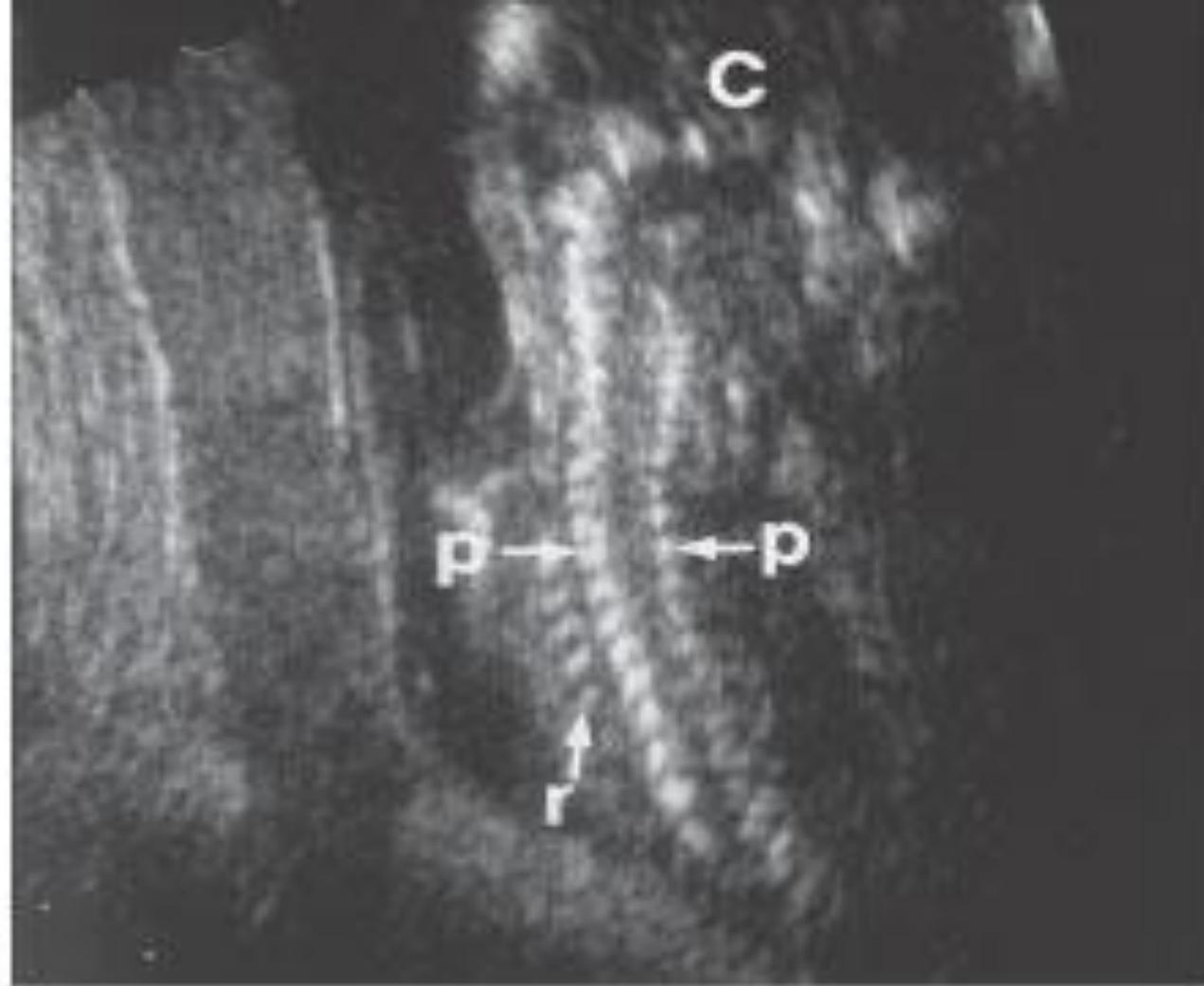
P

A

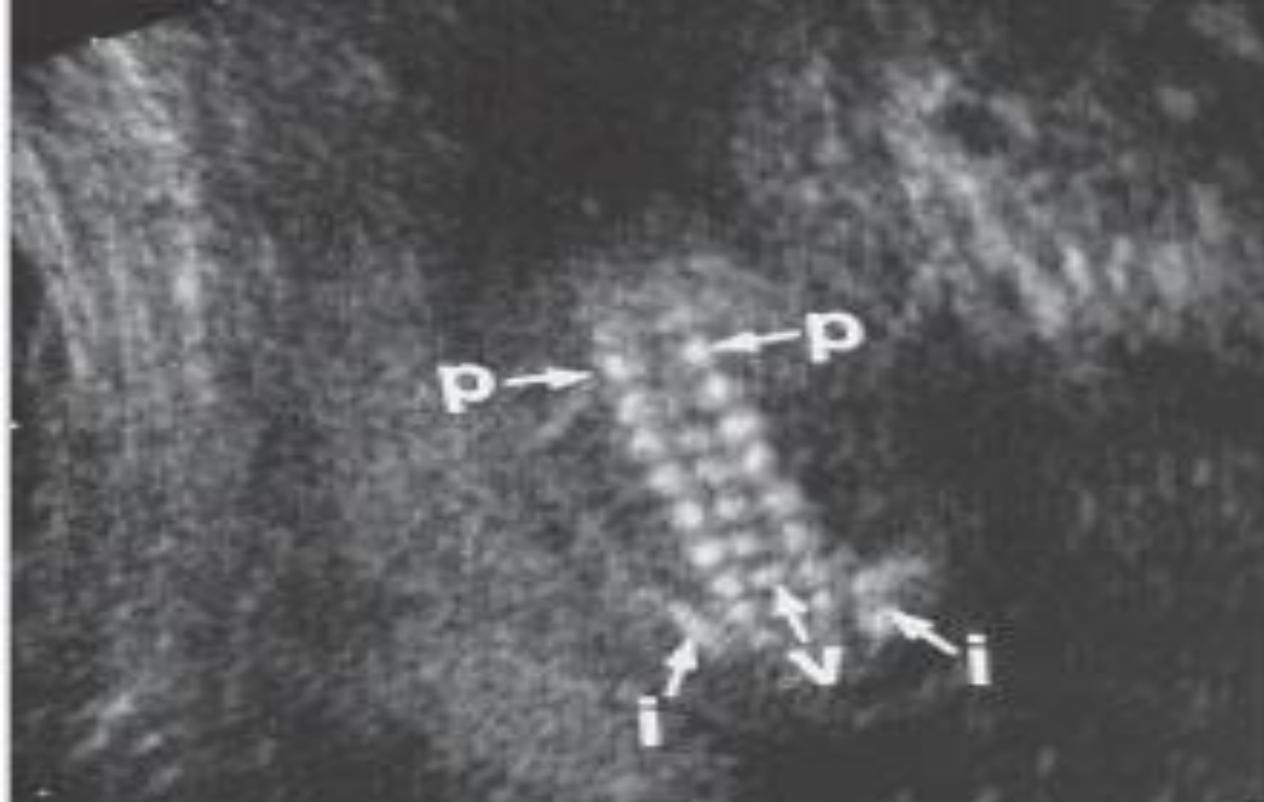
Coronal Images



KEY: Im, Lateral mass; od, odontoid process.



A Figure 45-25A **A**, Coronal view of the spine in a 19-week fetus, demonstrating the parallel nature of the posterior elements, or laminae (*p*), of the cervical and thoracic vertebrae. **C**, Cranium; *r*, rib. **B**, In the same fetus the

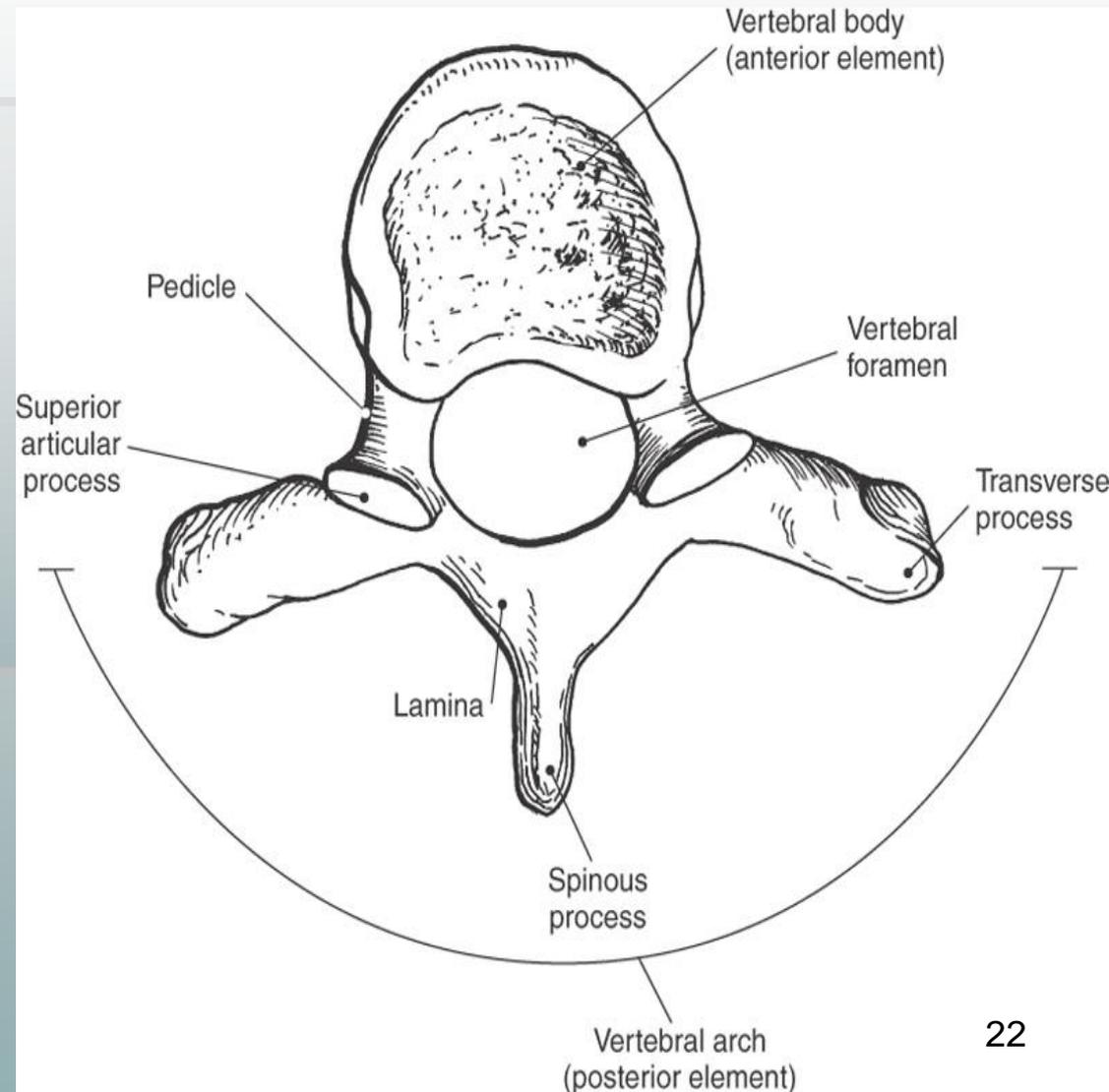


B

Figure 45-25B A, Coronal view of the spine in a 19-week fetus, demonstrating the parallel nature of the posterior elements, or laminae (*p*), of the cervical and thoracic vertebrae. *C*, Cranium; *r*, rib. **B**, In the same fetus the lumbosacral vertebrae are observed in the coronal plane. The posterior elements (*p*), or laminae, and vertebral body (*v*) are noted. In fetuses with spina bifida, widening across the posterior elements may be found (see Chapter 49). *i*, Iliac crest.

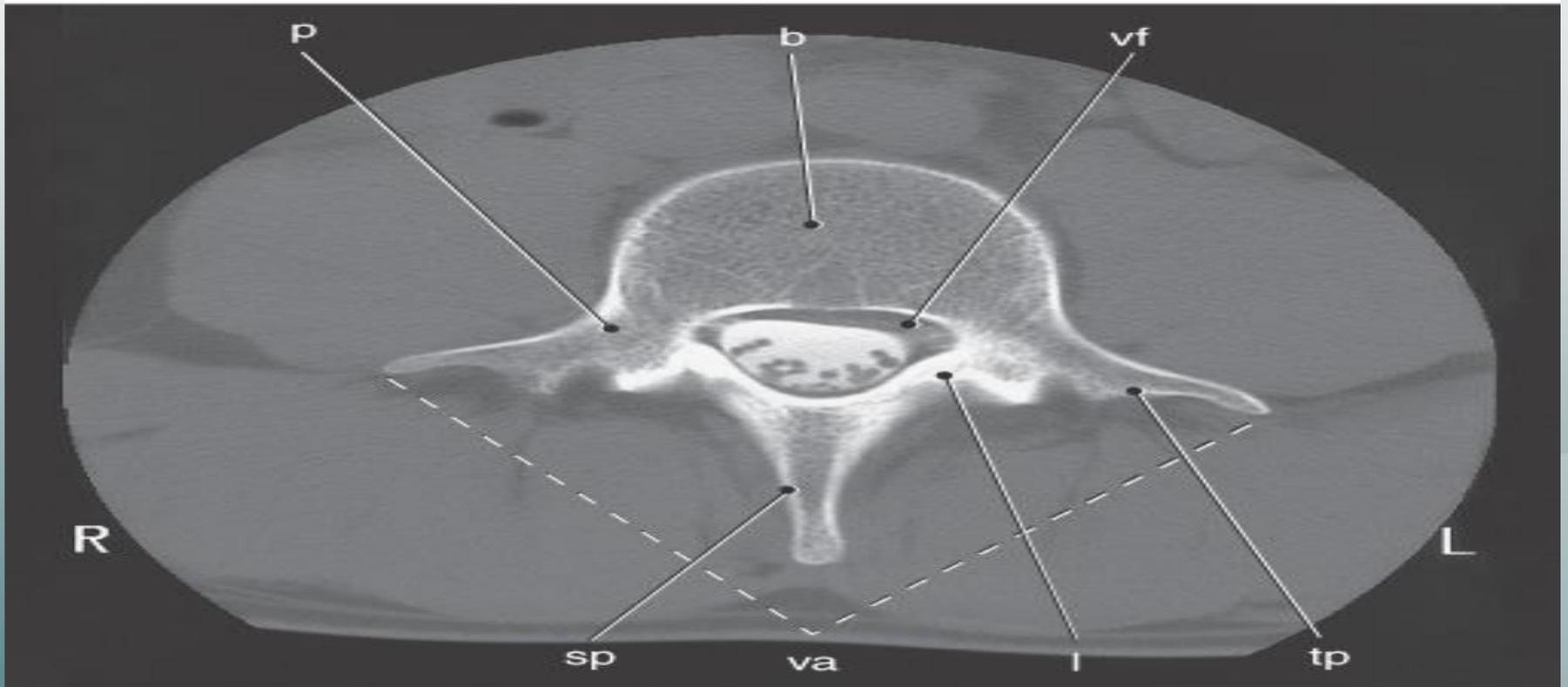
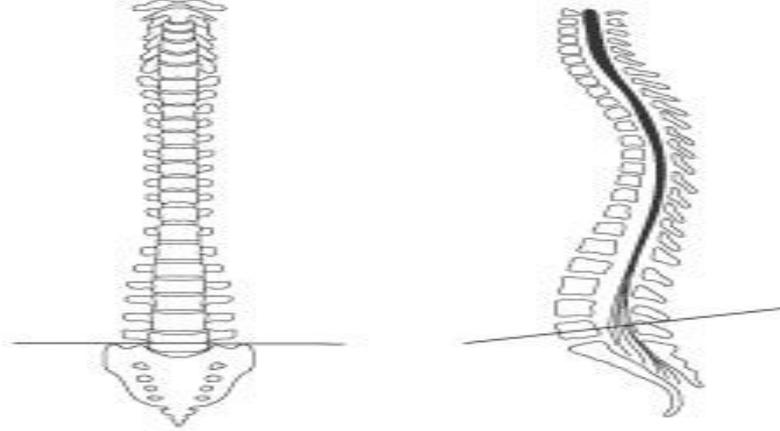
Vertebrae

- Consists of:
 - Body
 - Anterior
 - Vertebral Arch
 - Posterior



Cross Sectional Image

- **When the scanning plane cross-sections both laminae and equal amounts of tissue are noted on either side of the spinal echoes, the transverse processes and vertebral bodies are delineated**
 - **Scanning plane to screen for spinal defects**

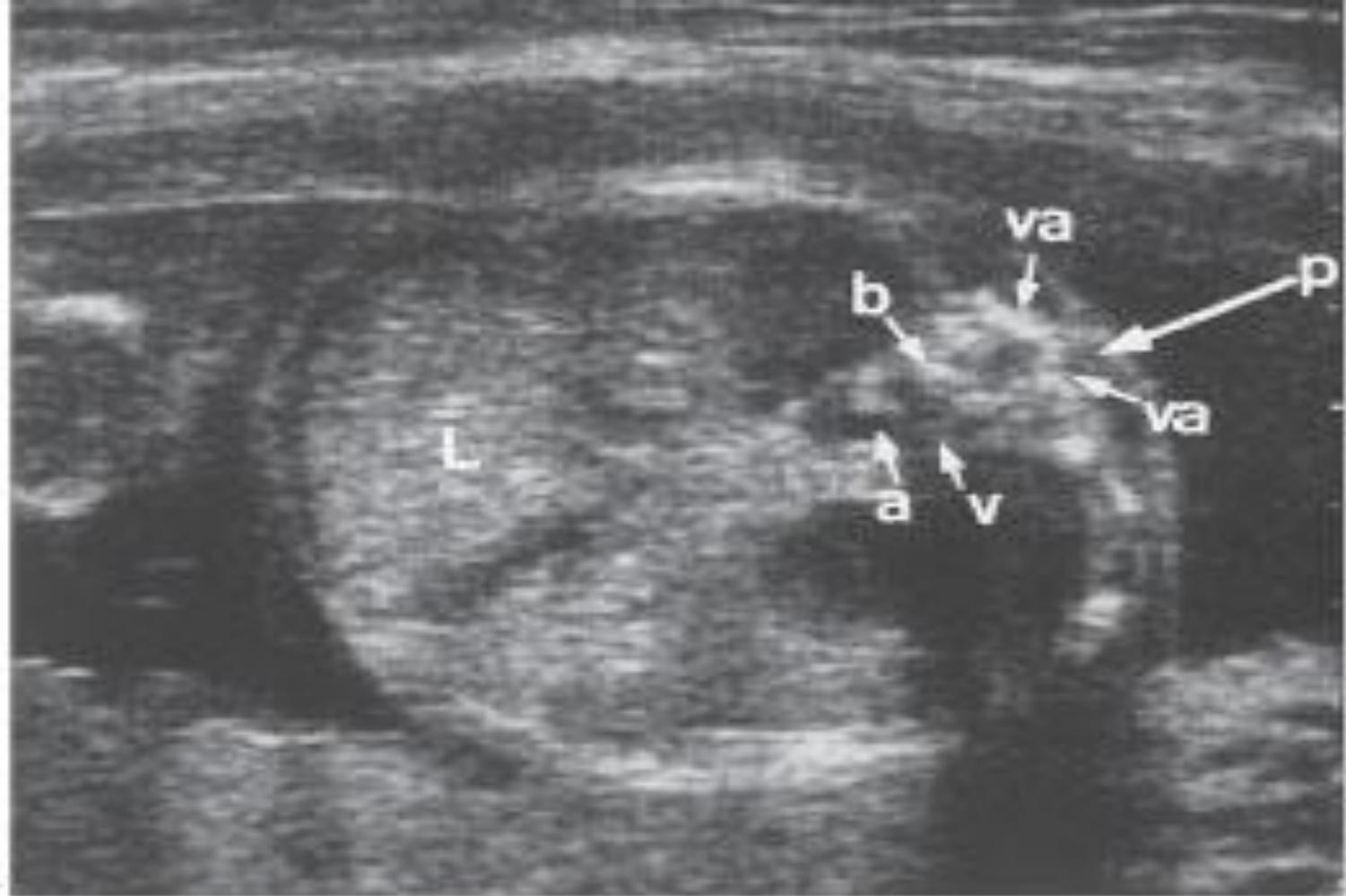


KEY: **p**, Pedicle; **b**, body; **vf**, vertebral foramen or canal; **sp**, spinous process; **va**, vertebral arch; **l**, lamina; **tp**, transverse process. 24

Transverse Images

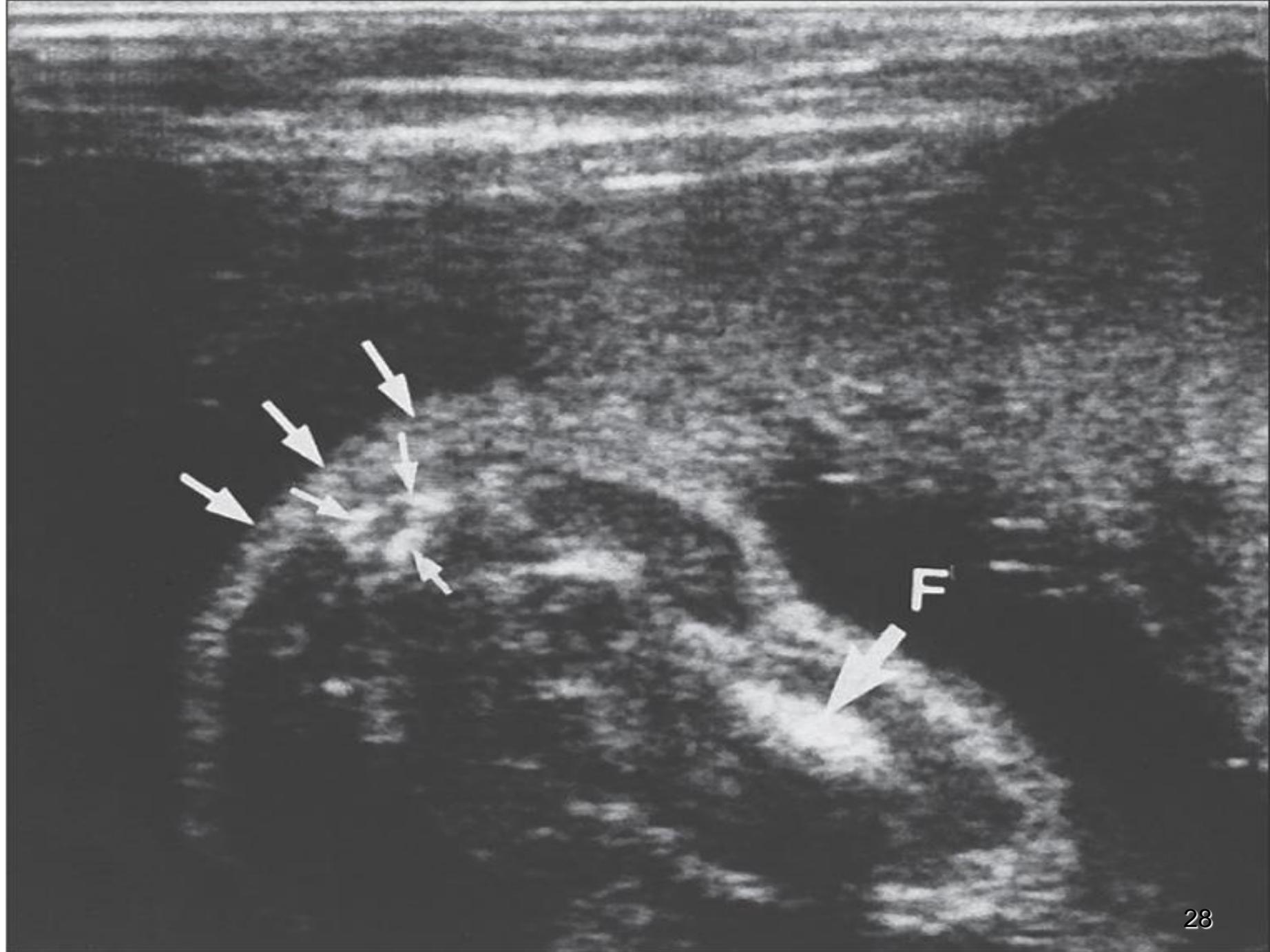
Transverse Plane

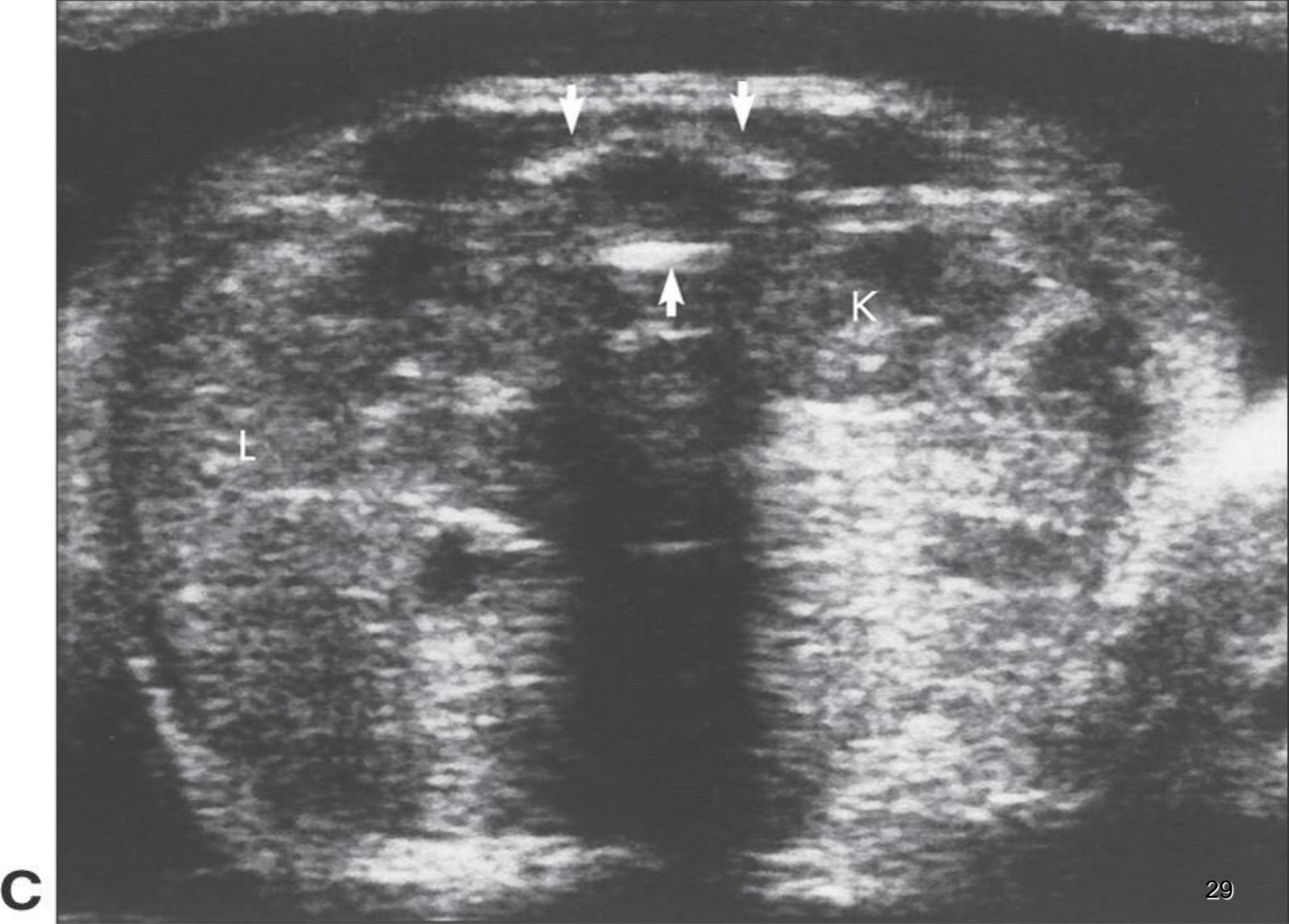
- **Three ossification points are visible equally spaced**
 - **1 - Center of the vertebral body**
 - **2 - Posterior elements (laminae or pedicles)**
- **Spinal column appears as a closed circle**
 - **Indicates closure of the neural tube**



A

Figure 45-27A A, Transverse scans of the vertebral column showing the echogenic ring produced by the vertebral body and posterior elements, or laminae. Thoracic vertebrae with typical landmarks. *L*, Liver; *a*, aorta; *b*, body; *p*, posterior vertebral muscles; *v*, vena cava; *va*, vertebral arch or posterior elements.

B



C

29

Spinal Defects

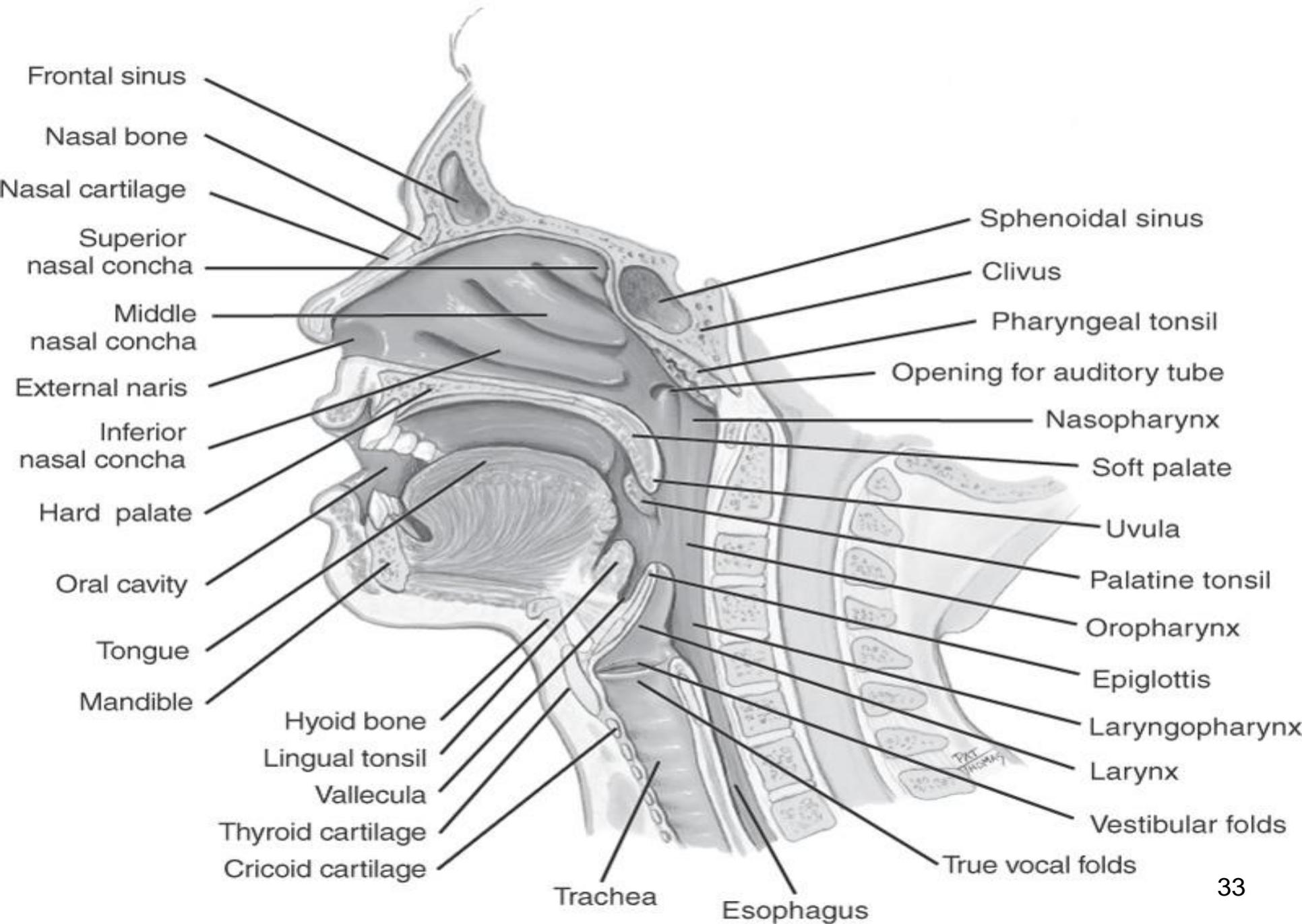
- **Three ossification points should be identified (normal)**
- **Pedicles appear splayed in a**
 - **“V”**
 - **“C”**
 - **“U”**

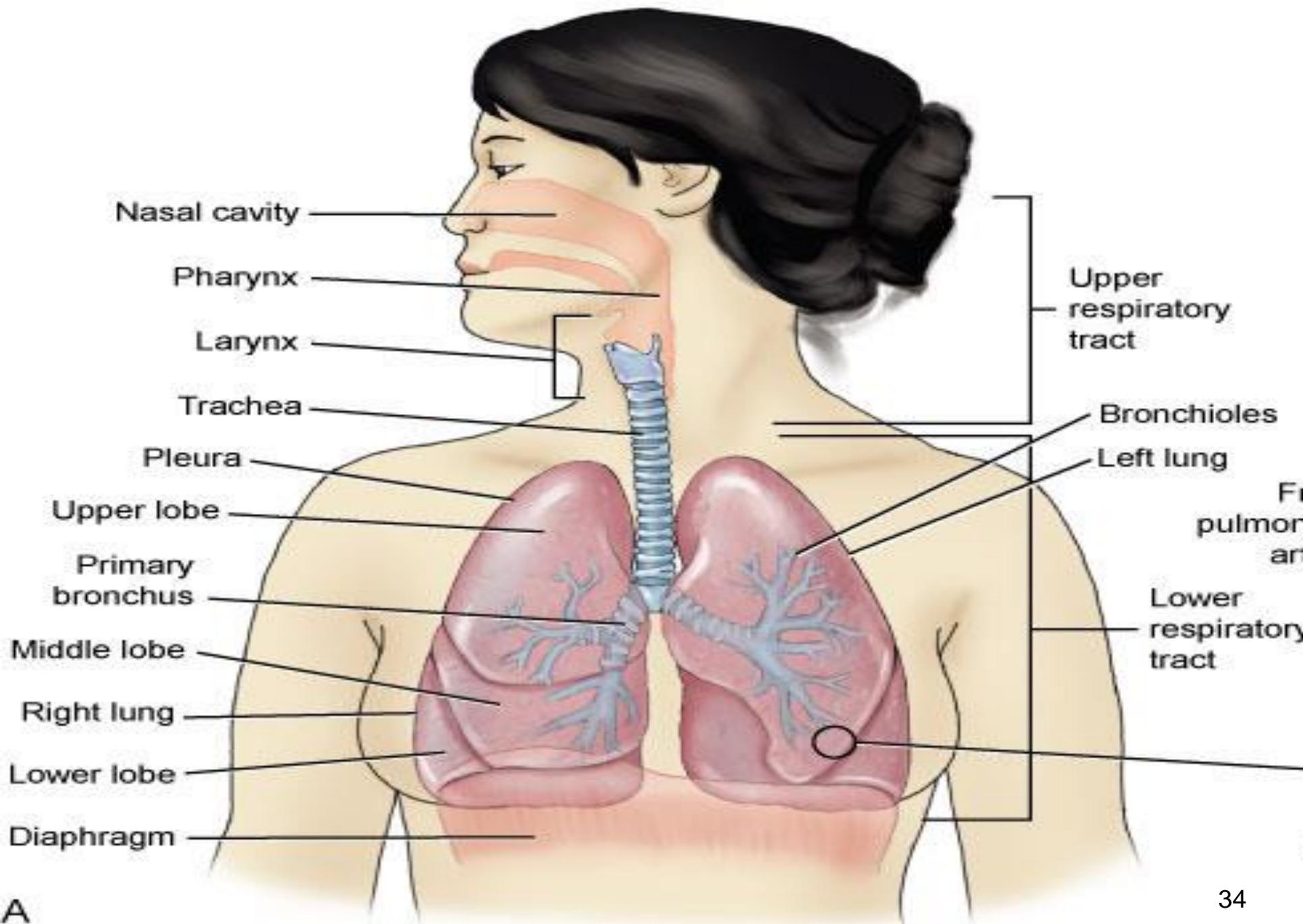
NECK

Chapter 5

Organs

- **Pharynx (throat)**
- **Larynx (voice box)**
- **Esophagus**
- **Trachea (windpipe)**
- **Salivary glands**
- **Thyroid gland**
- **Cervical lymph nodes**

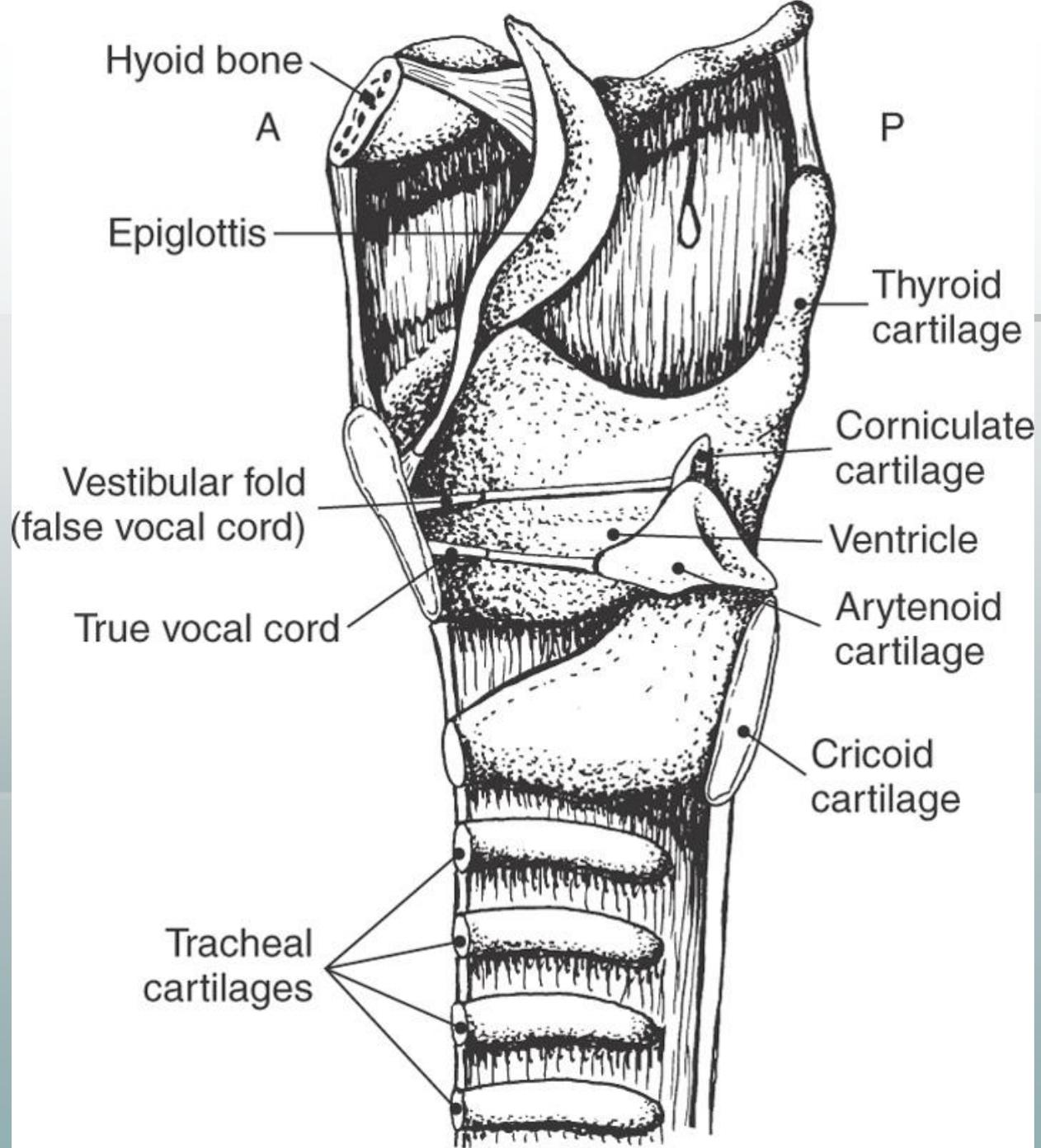


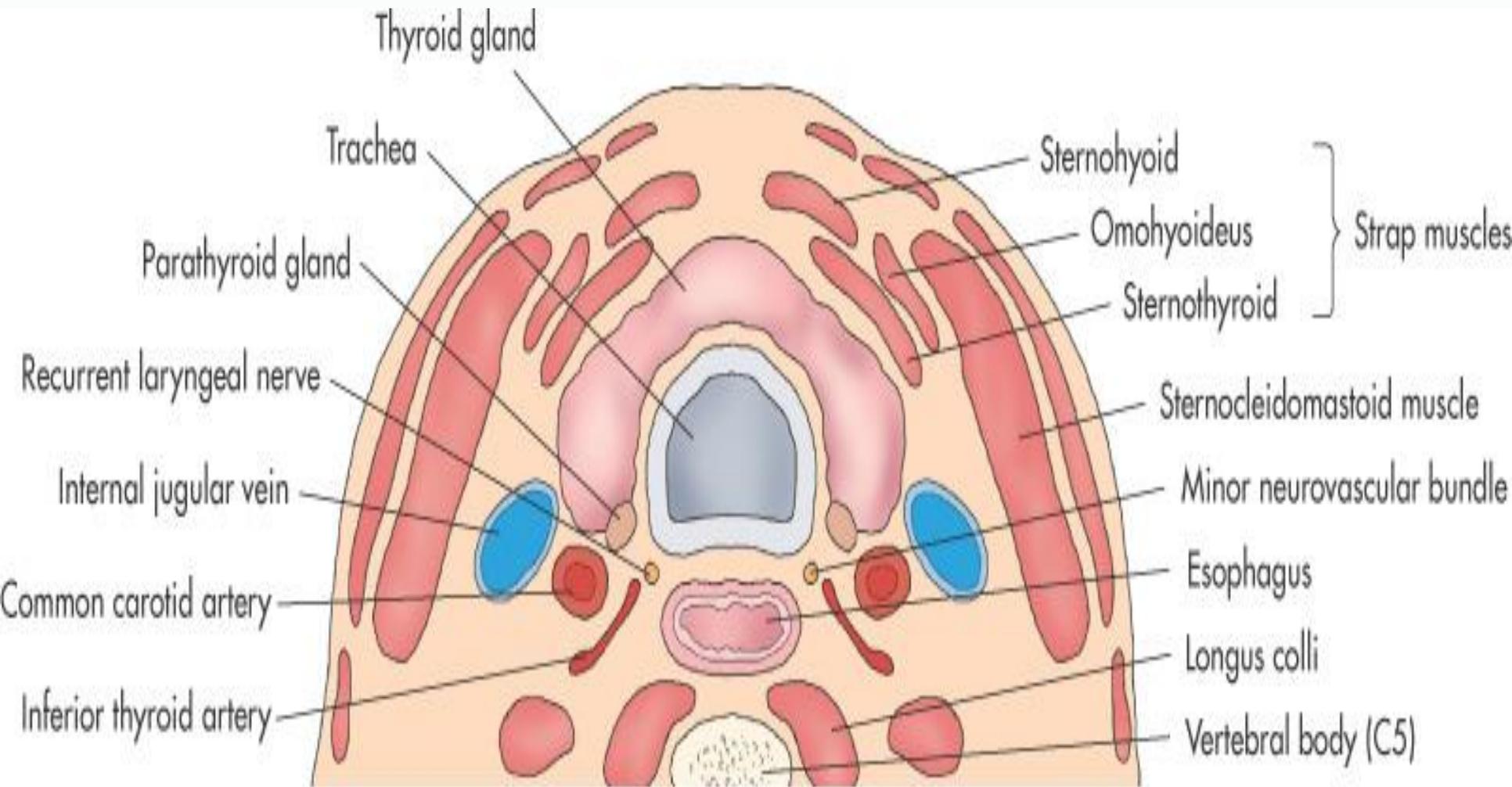


A

Trachea

- **Airway**
- **Extends from the larynx to the lungs**
- **Anterior to esophagus**
- **Elastic tube reinforced by many “C” shaped pieces of cartilage**
 - **Maintains open passageway for air**





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TRANSVERSE THYROID
INFERIOR

VFX13-5/12.0
Thyroid
100%
32dB RS3
3.0cm 20fps

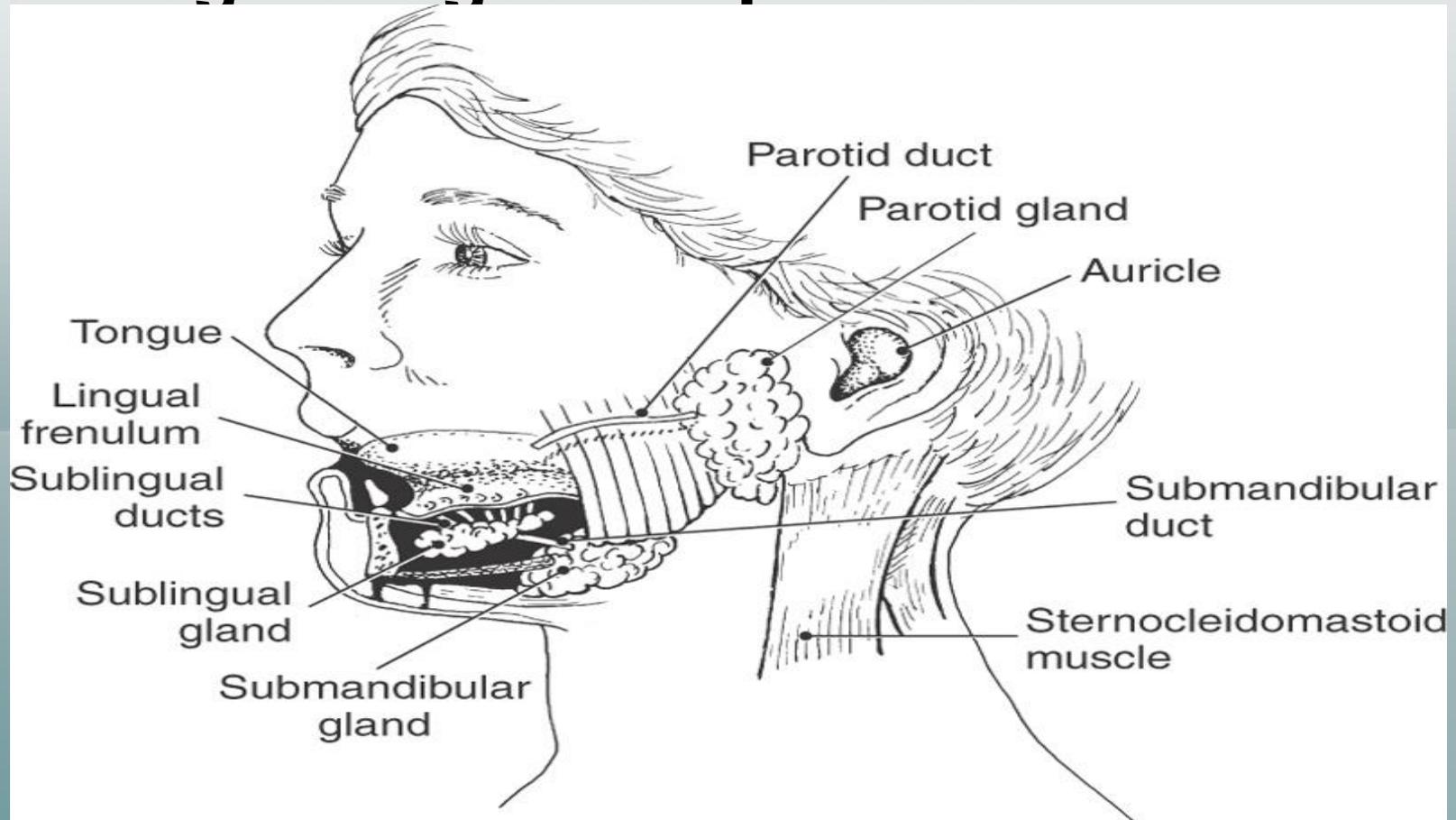
Trachea

Text

C

Salivary Glands

- Produce and empty saliva into mouth
- Begins digestion process

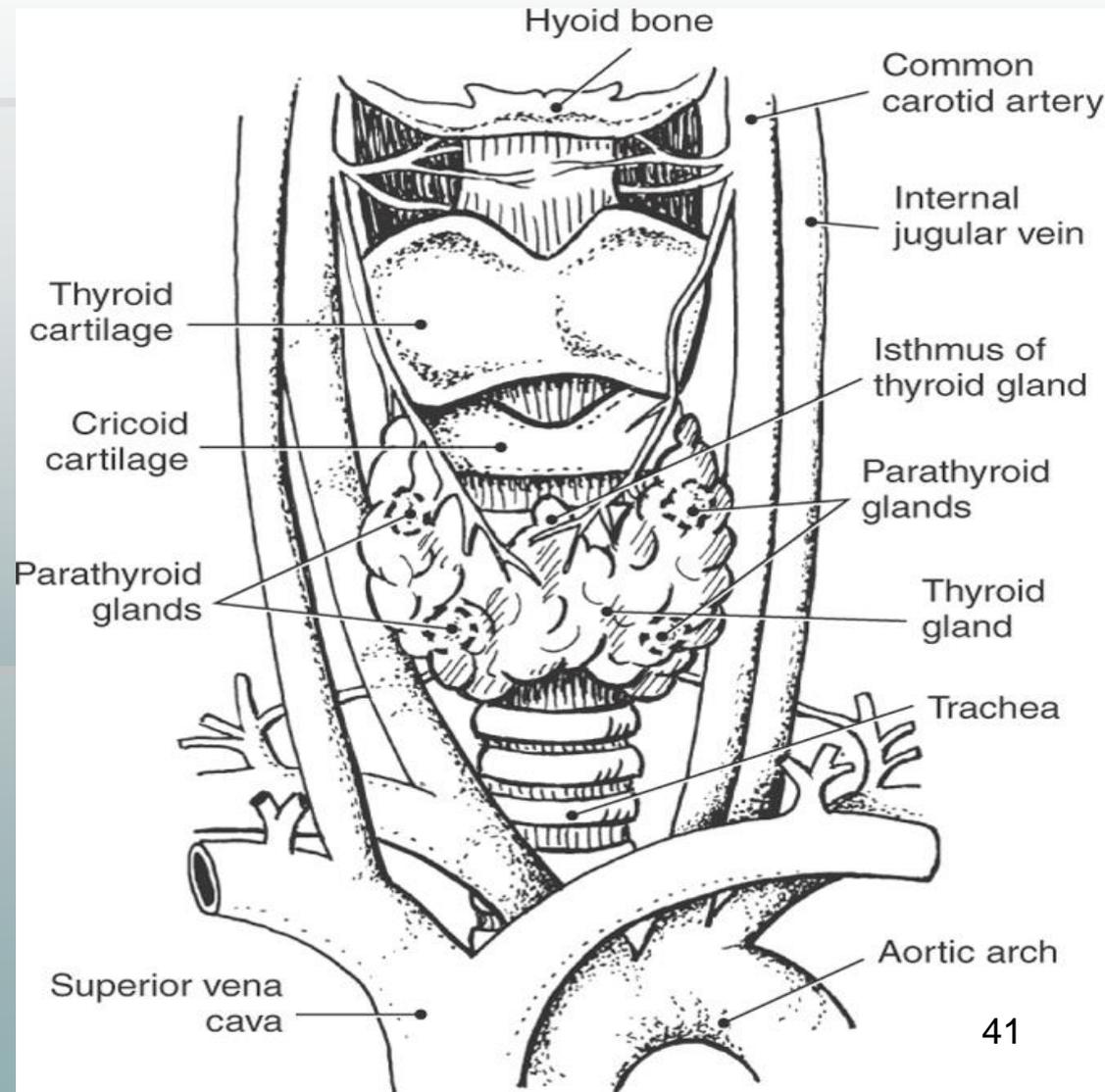


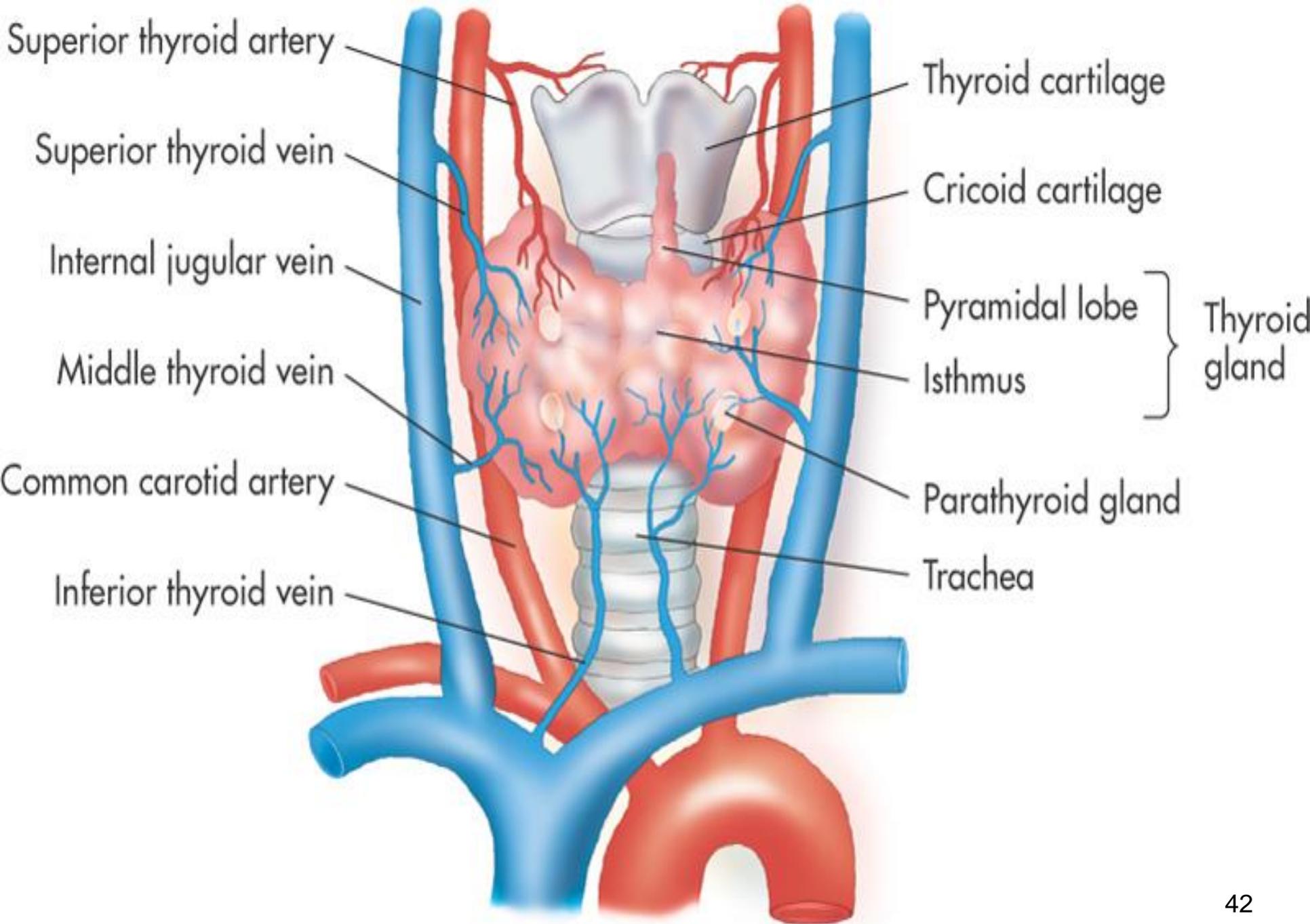
Submandibular Glands

- **Border the posterior half of mandible**
- **Extends from angle of mandible to hyoid bone**
- **Can be seen by sonography**

Thyroid Gland

- Endocrine gland
- Consists of:
 - 2 lobes
 - Isthmus





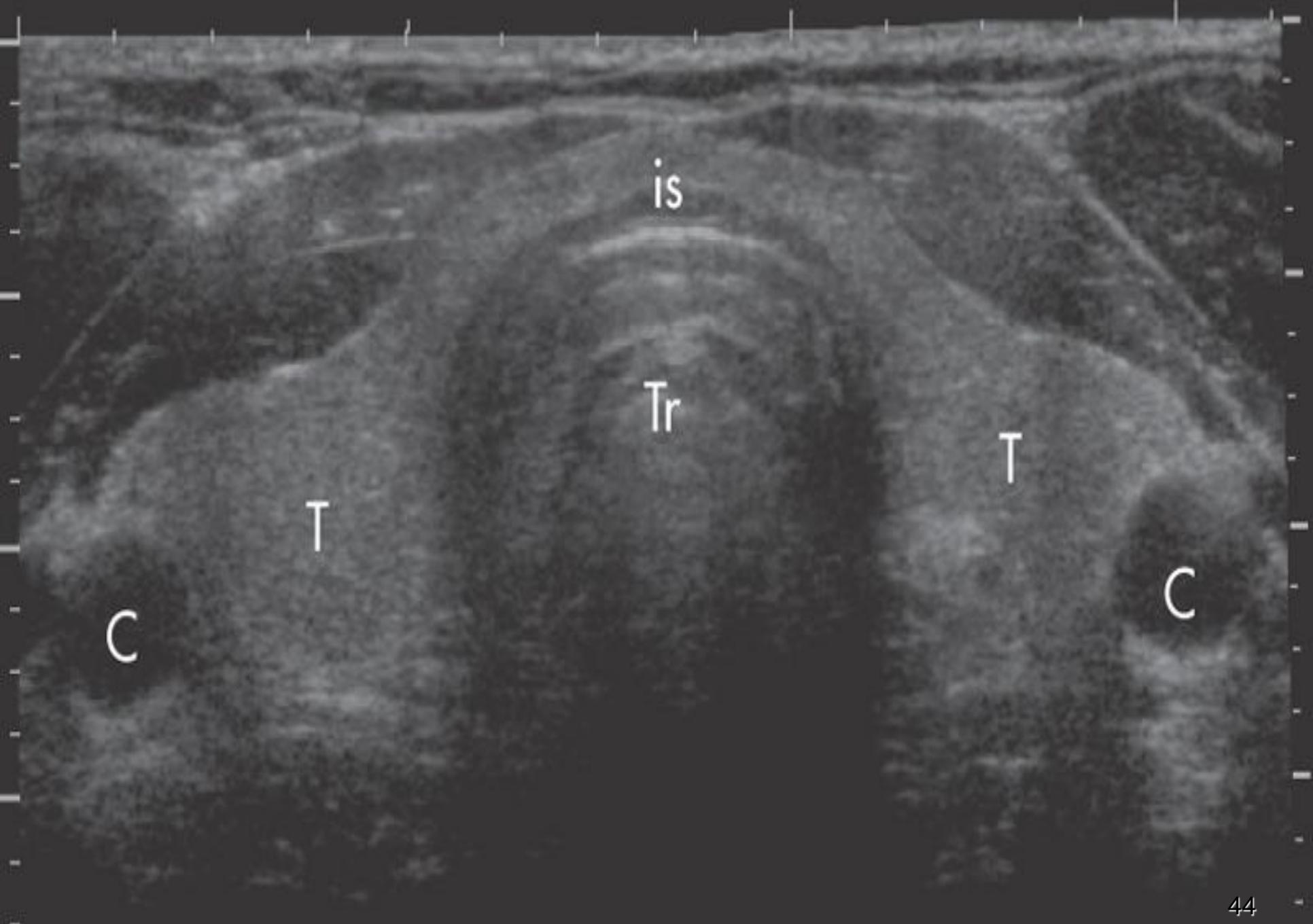
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TRANSVERSE THYROID
ISTHMUS

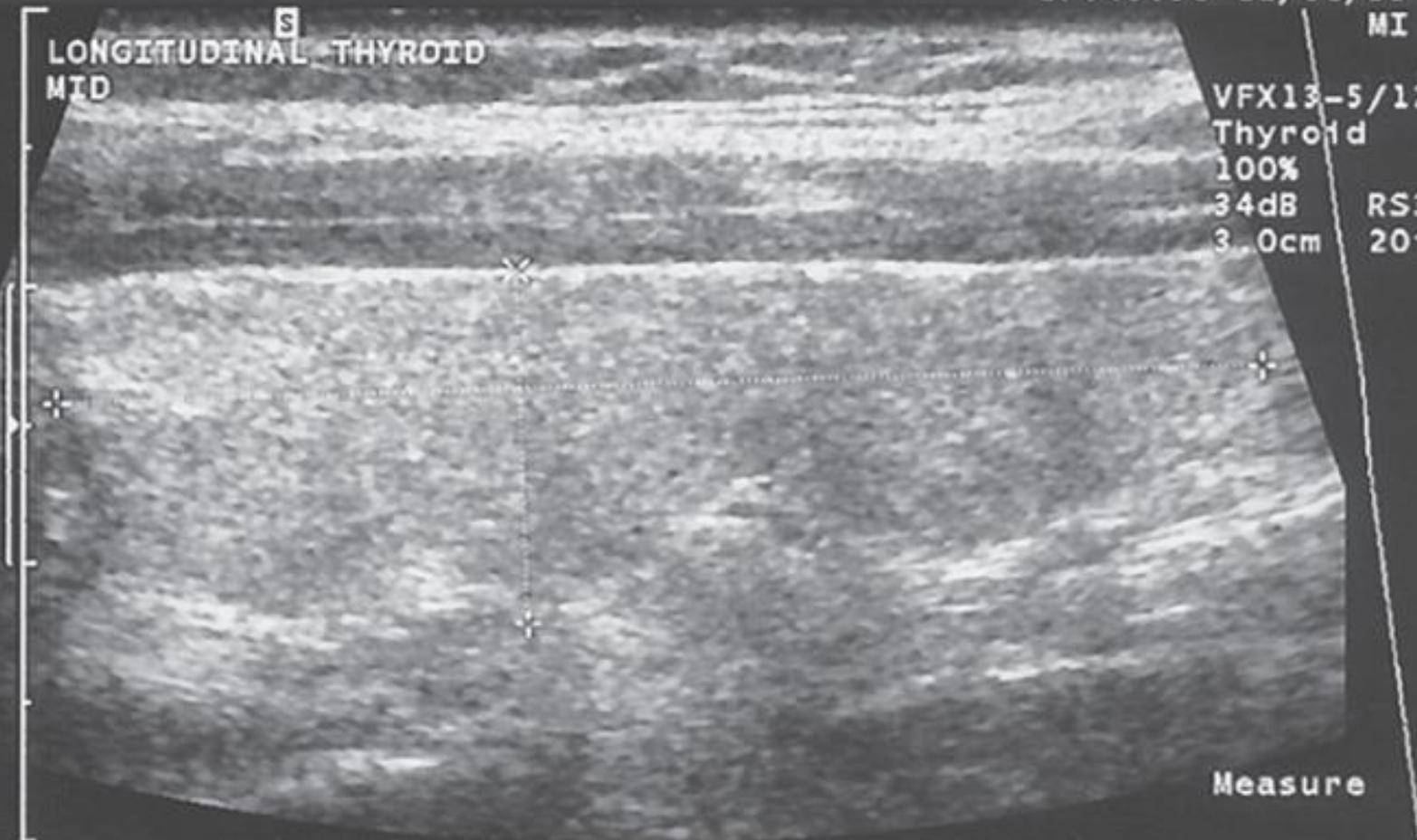
VFX13-5/12.0
Thyroid
100%
34dB RS3
3.0cm 20fps





LONGITUDINAL THYROID
MID

VFX13-5/12.0
Thyroid
100%
34dB RS3
3.0cm 20fps



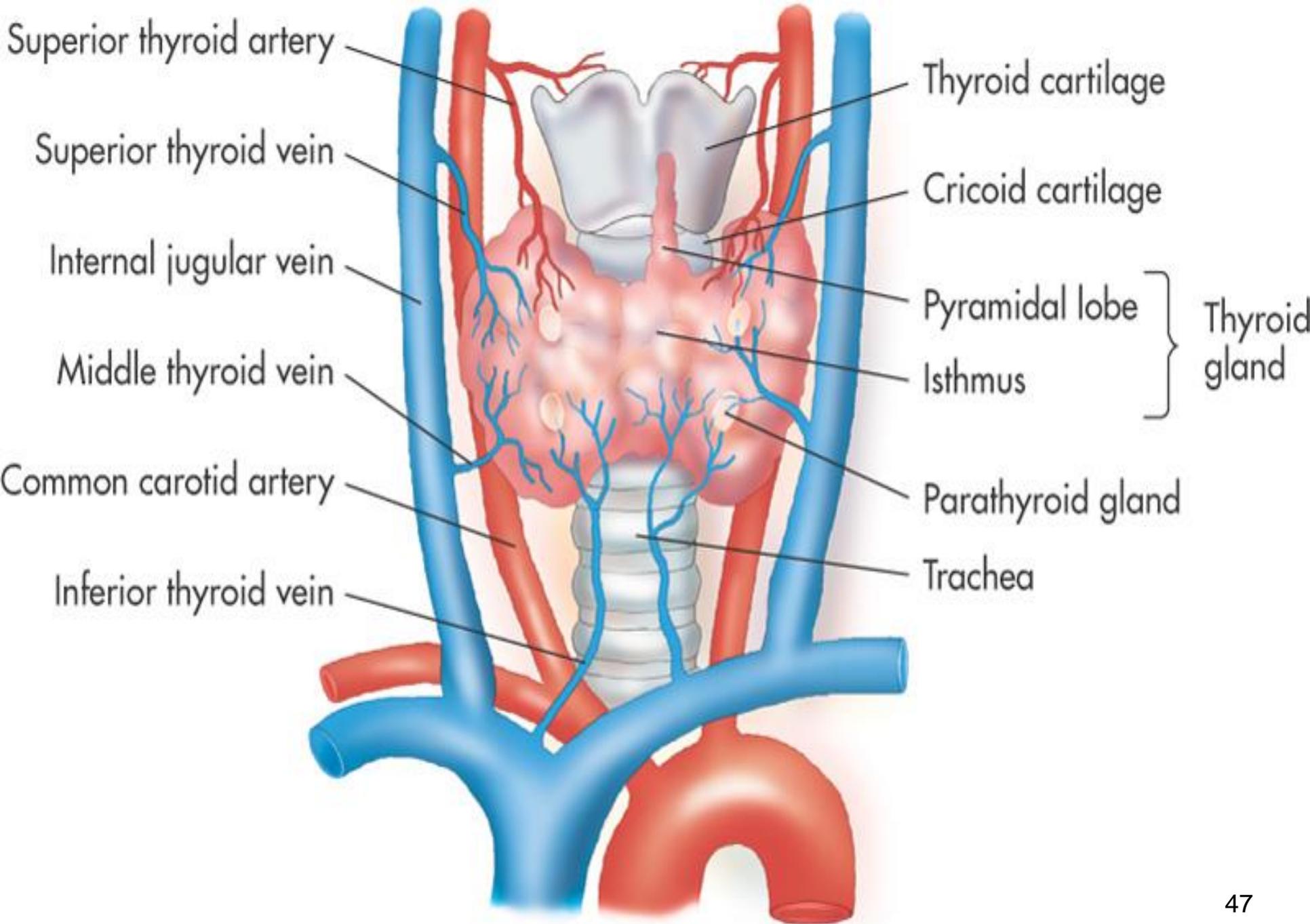
Measure

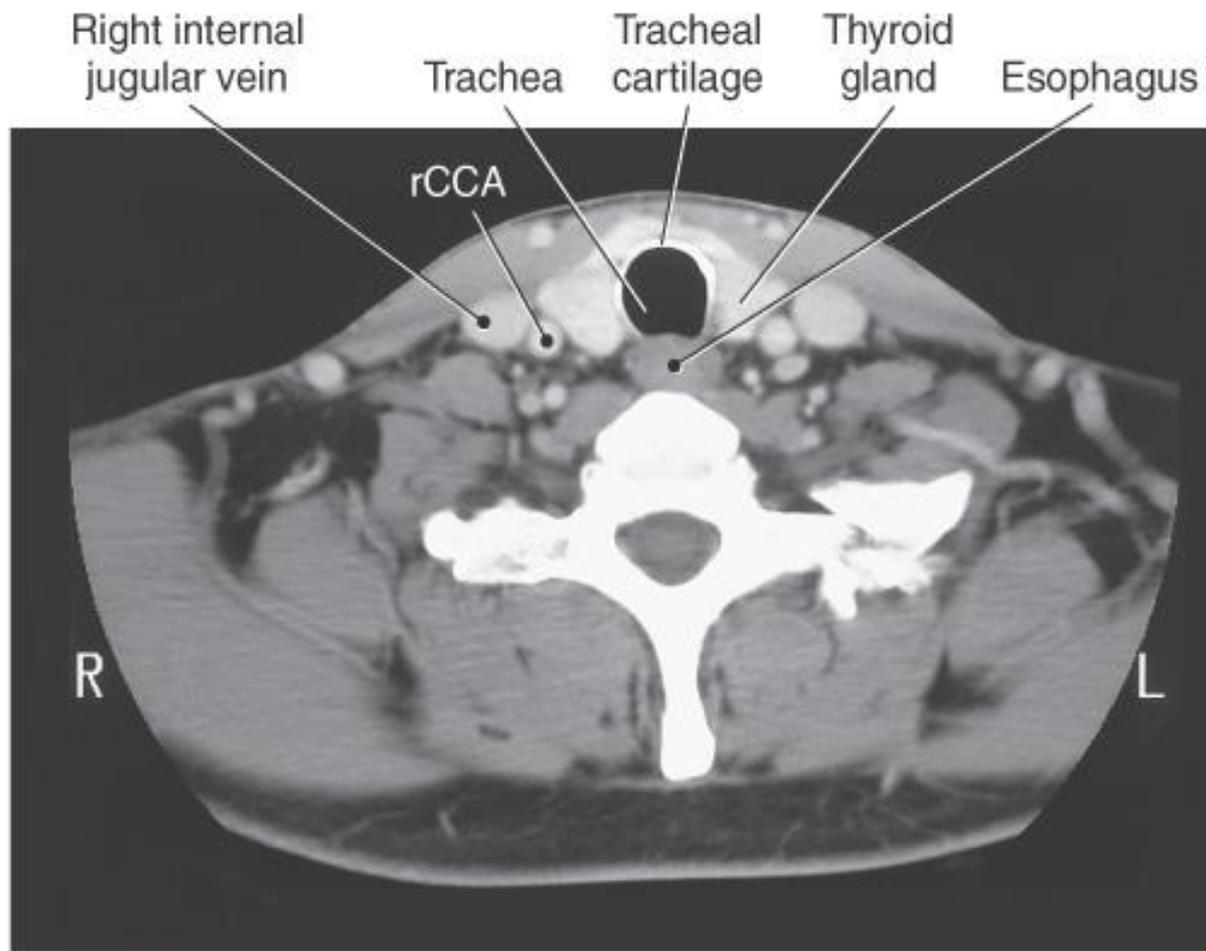
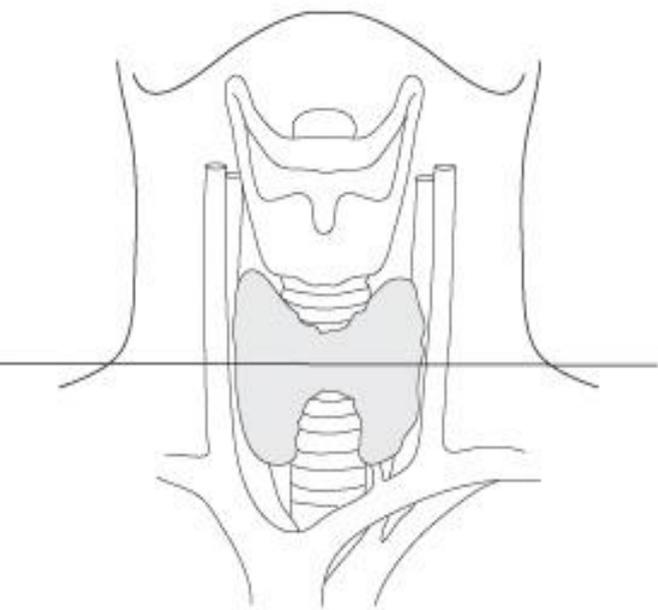
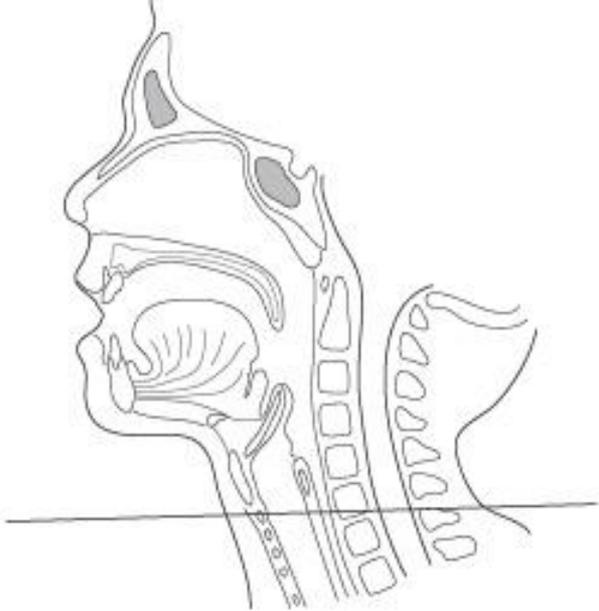
+ D= 42.7mm
x D= 12.7mm

B

Parathyroid Glands

- Located on the posterior surface of the thyroid
- Responsible for the metabolism of calcium
- Usually four
 - Two pairs





KEY: rCCA, right common carotid artery.

Cervical Lymph Nodes

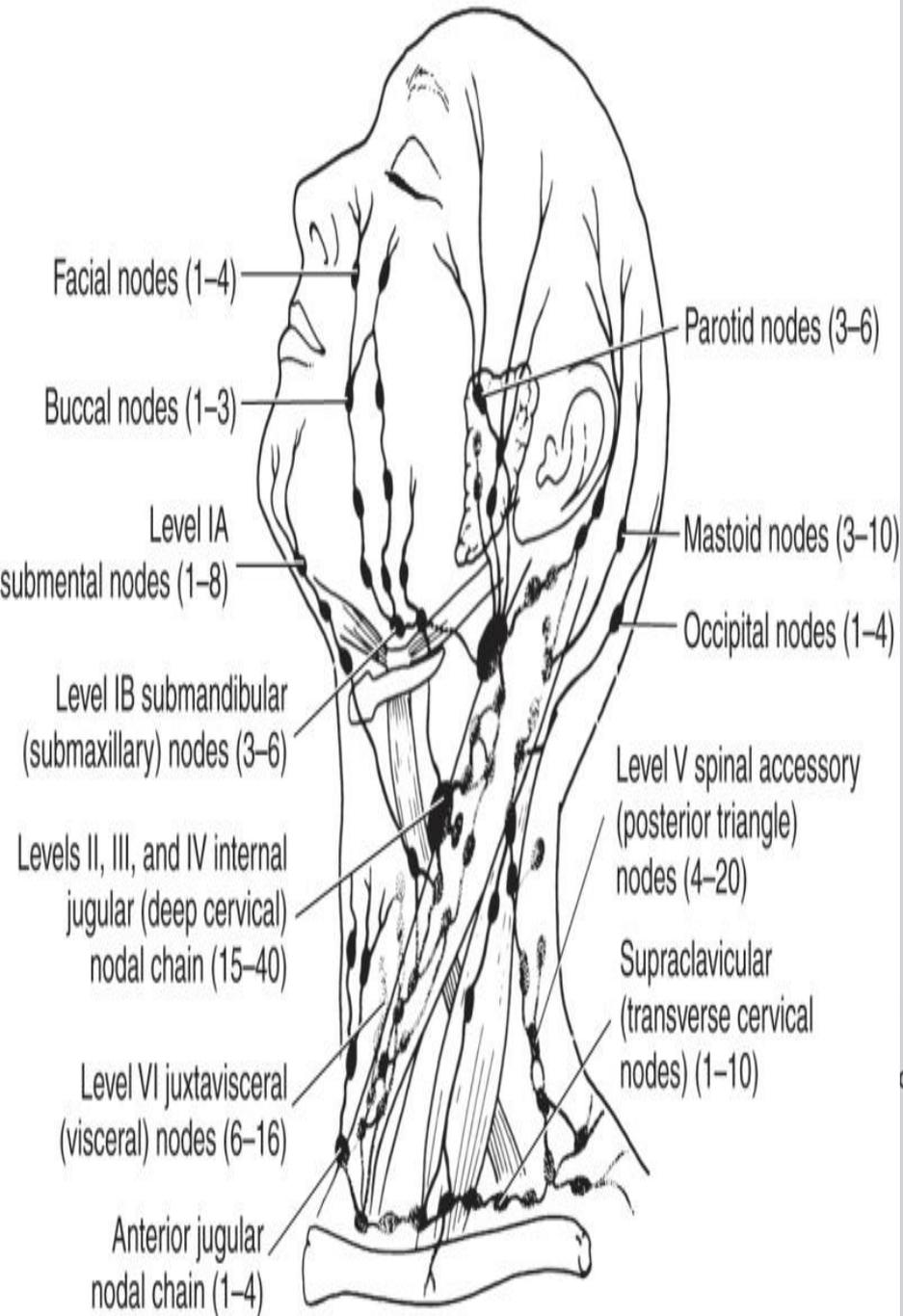
- **Extensive lymphatic network**
 - **More than 1/3 of total number of lymph nodes**
 - **Approximately 75 lymph nodes per side**

Lymph Nodes

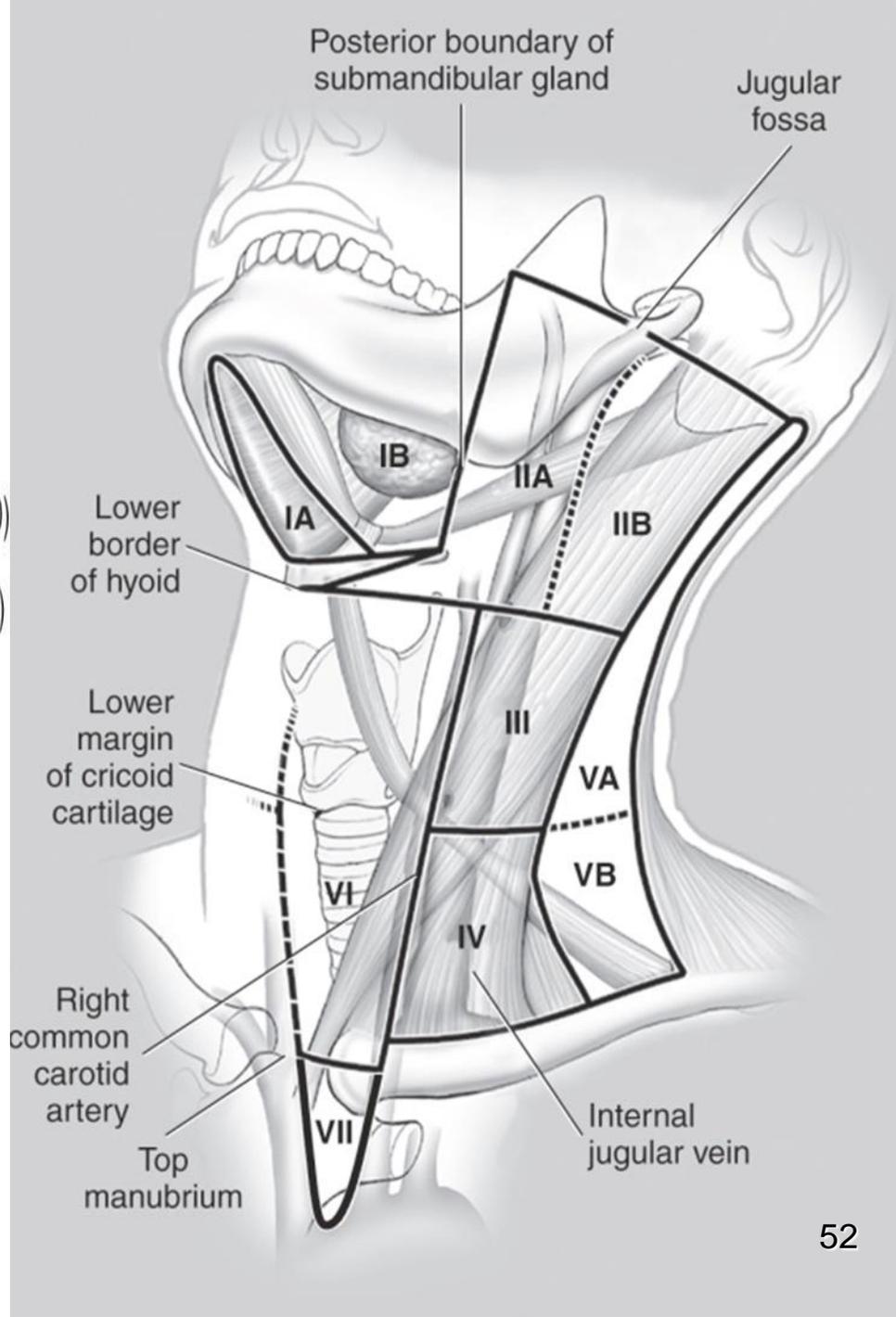
- **Clustered in regions throughout the vessels of the lymphatic system**
- **Lymph vessels carry fluid from interstitial spaces to regional lymph node**
 - **Filter fluid of harmful foreign particles before emptying into venous blood**

Cervical Lymph Nodes

- **Grouped**
 - **Along lower border of the jaw**
 - **In front of and behind ears**
 - **Deep in the neck along the larger blood vessels**
- **Classified or divided into seven levels or regions**
 - **For ease of identification**
 - **Clinically and surgically**

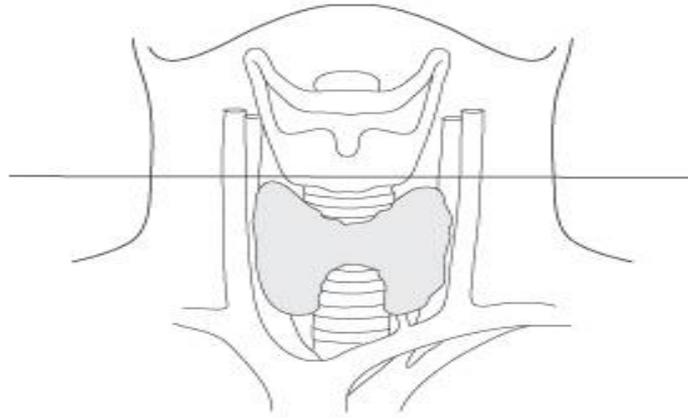
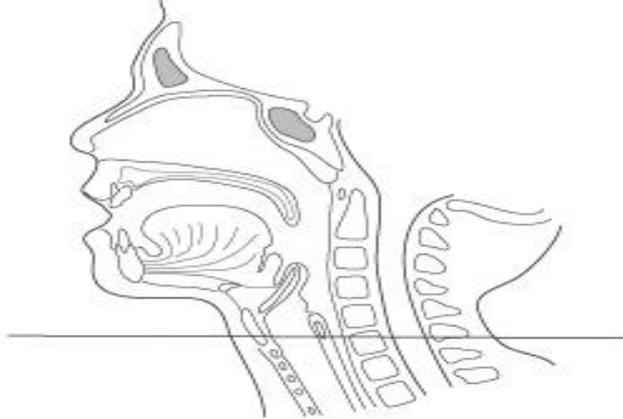


From Som PM, Curtin HD: *Head and neck imaging*, ed 5, St. Louis, 2011, Mosby.



Cervical Lymph Nodes

- **Table 5-1 Neck Lymph Nodes**
 - **Levels**



Thyroid cartilage

Common facial vein

Pharyngeal constrictor muscle

Cricoid cartilage

External jugular vein

Scalene muscles

Levator scapulae muscle

Intrahyoid muscle

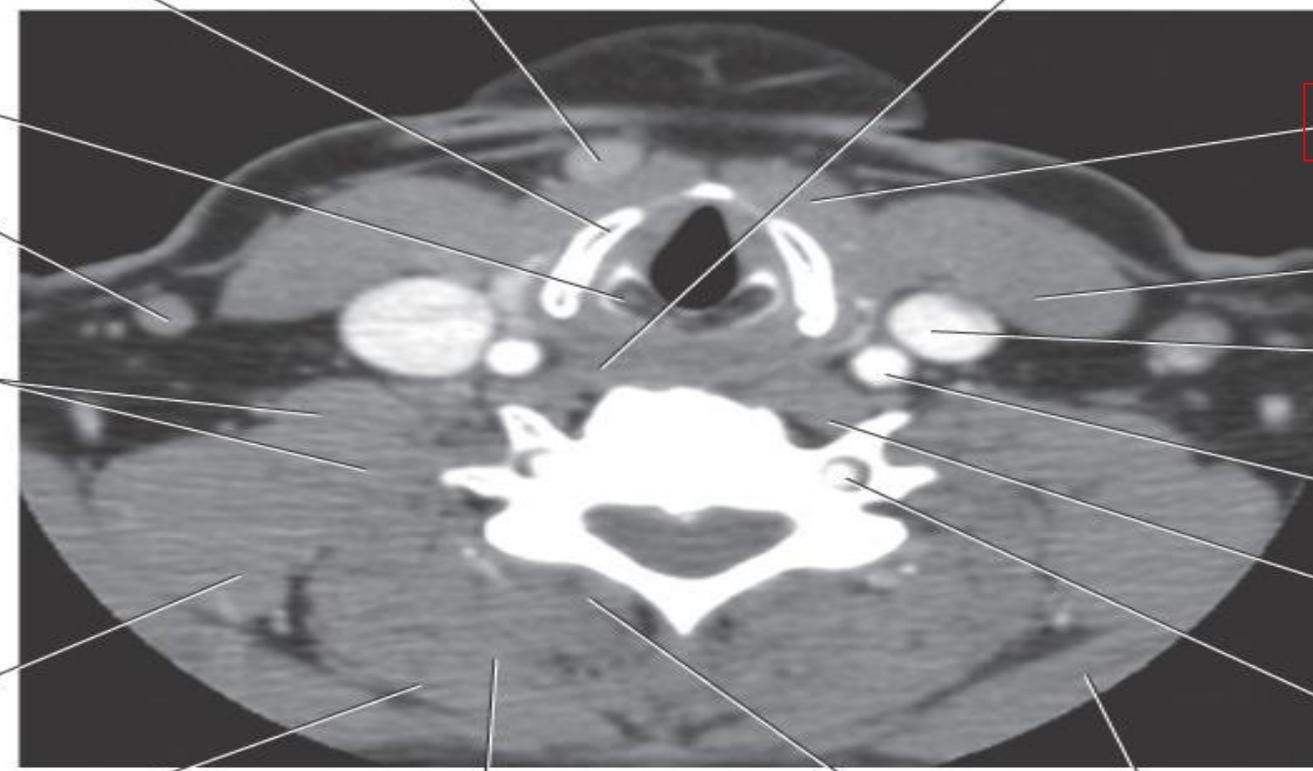
Sternocleidomastoid muscle

Internal jugular vein

Common carotid artery

Longus colli muscle

Vertebral artery

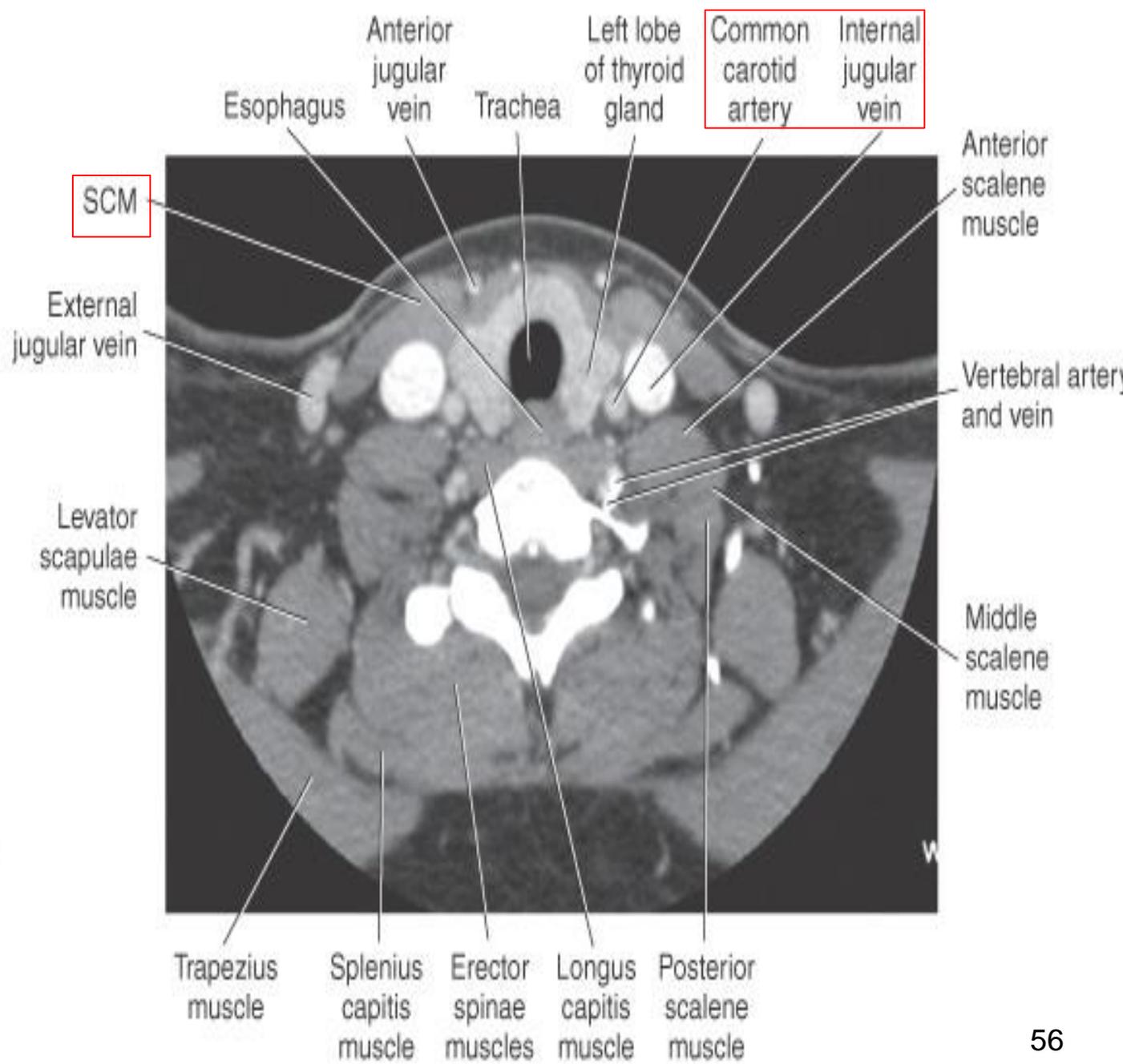
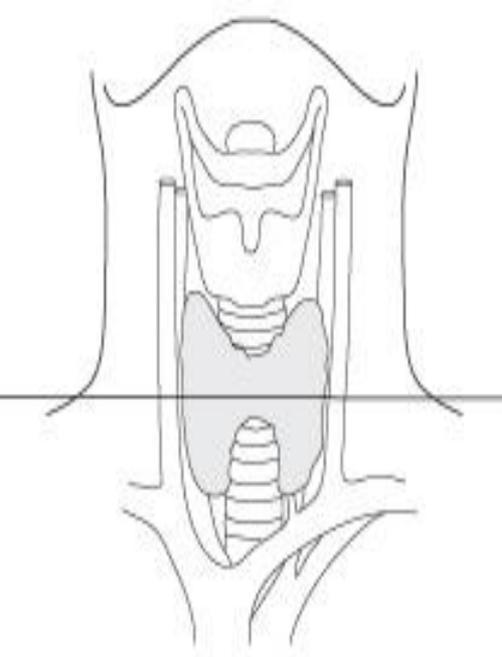


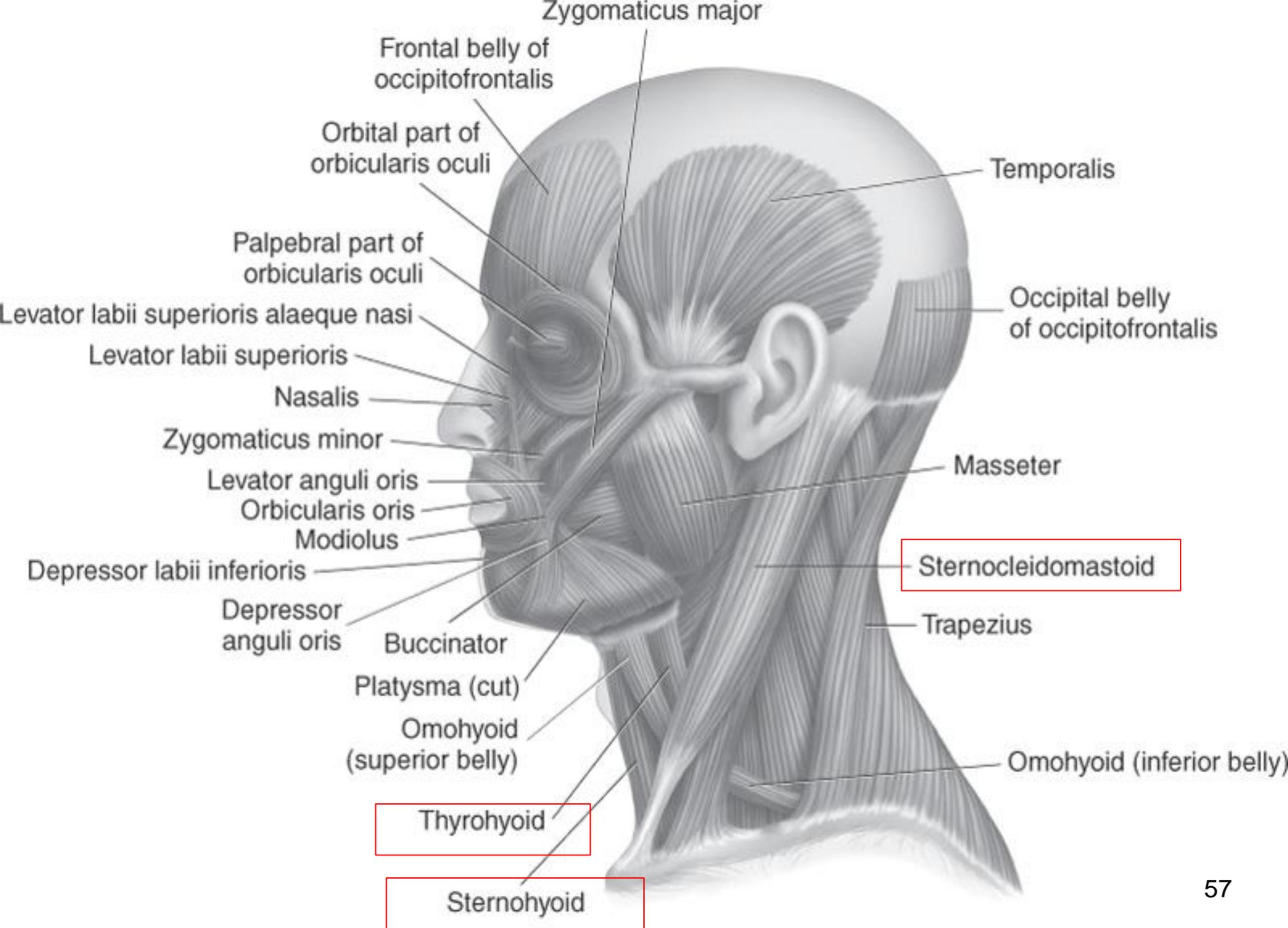
Splenius capitis muscle

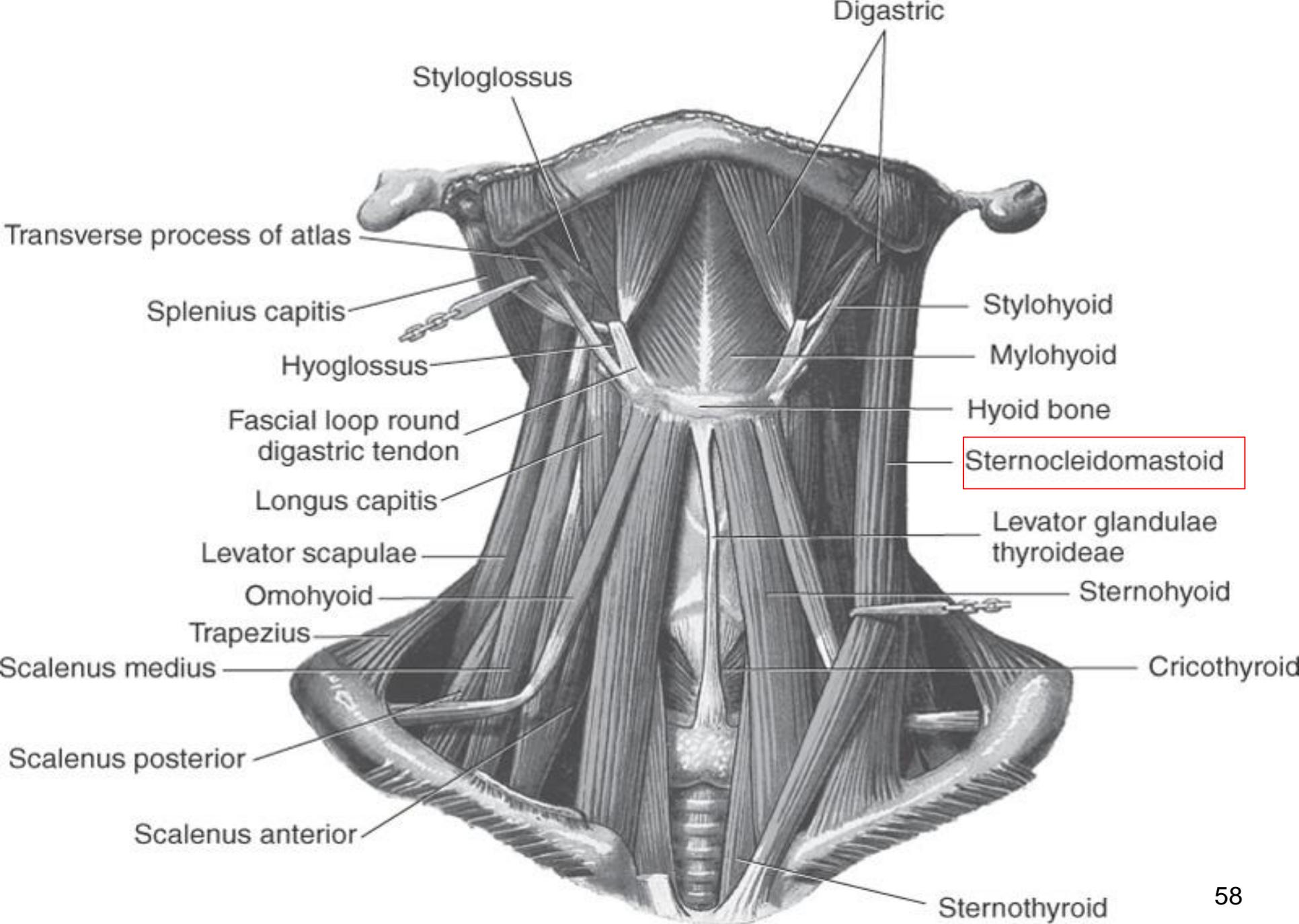
Semispinalis capitis muscle

Multifidus muscle

Trapezius muscle

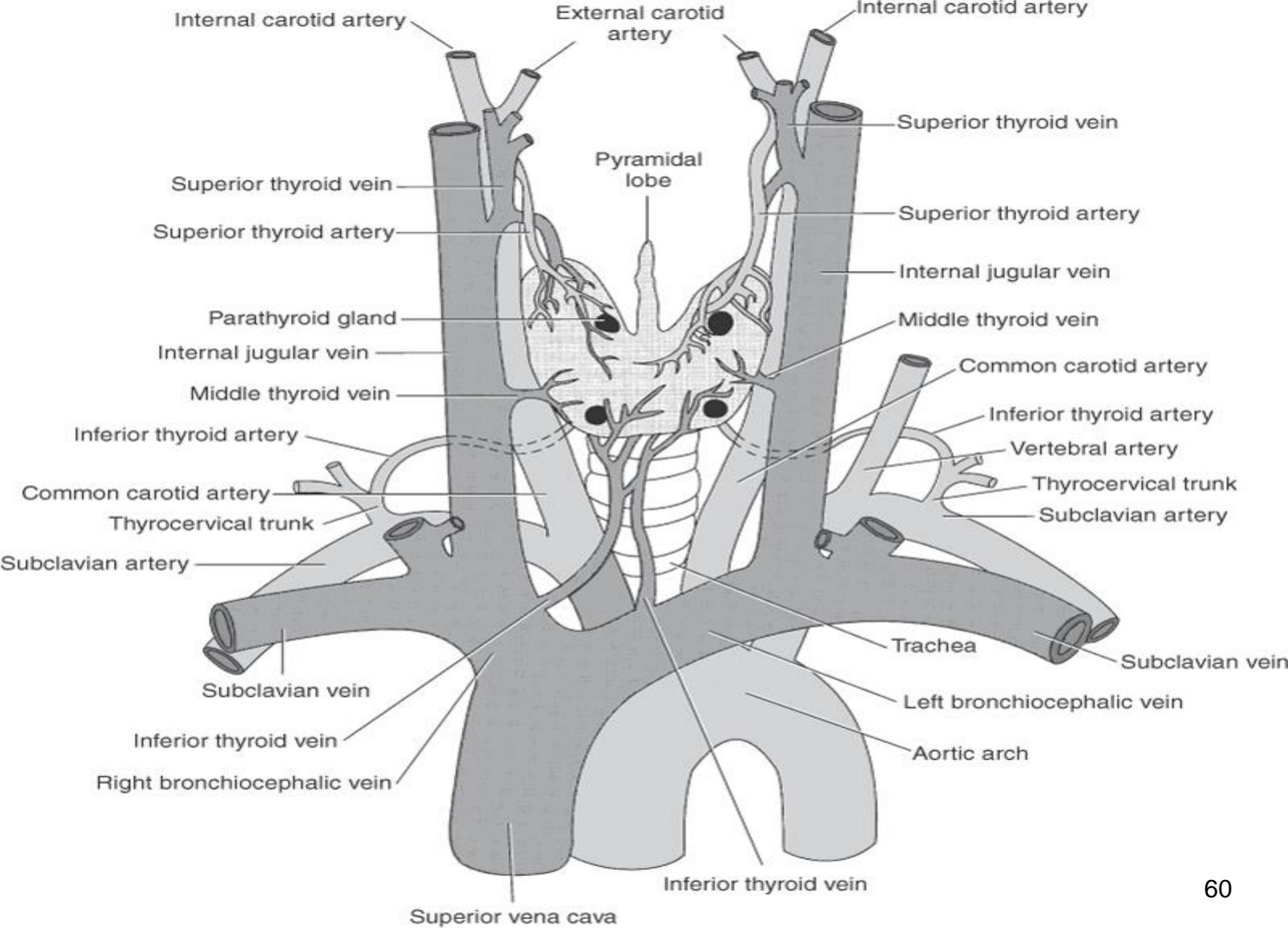






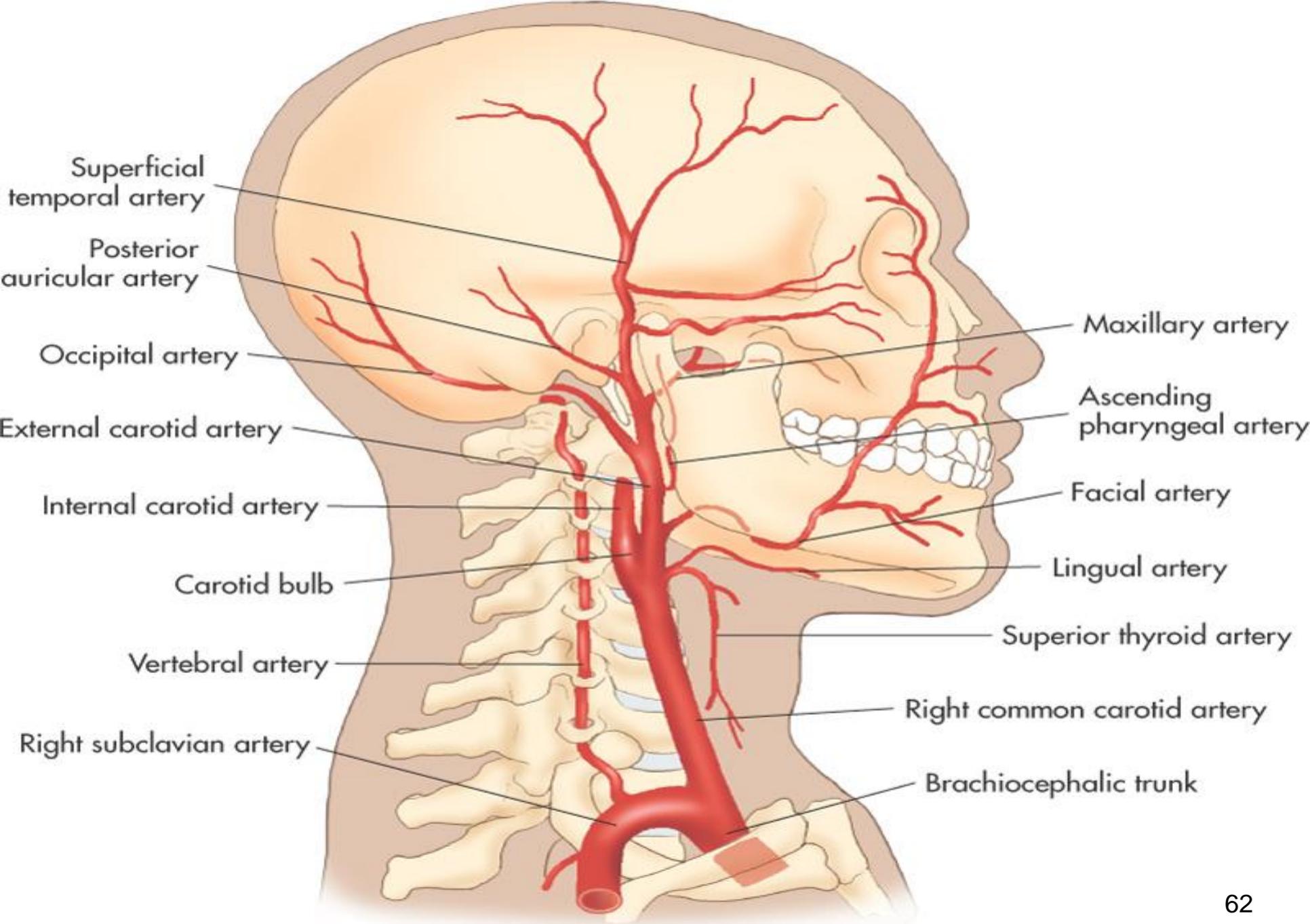
Vasculature Structures

- **Carotid Arteries**
- **Vertebral Arteries**
- **Jugular Veins**



Carotid Arteries

- **Right Common Carotid Artery**
 - **Arises from brachiocephalic or innominate artery**
- **Left Common Carotid Artery**
 - **Arises directly from the aortic arch**
- **Branch into:**
 - **Internal Carotid Artery (ICA)**
 - **External Carotid Artery (ECA)**



ICA

- Usually the larger and more lateral of the two branches of the CCA
- Supplies blood to the:
 - Ipsilateral Cerebral Hemisphere
(Anterior brain)
 - Eyes
 - Forehead
 - Nose

ECA

- Usually smaller and more medial of the two branches of the CCA
- Supplies blood to the neck, face and scalp
- Has Eight Branches:
 - Superior Thyroid Artery
 - Ascending Pharyngeal Artery
 - Lingual Artery
 - Occipital Artery
 - Facial Artery
 - Posterior Auricular Artery
 - Superficial Temporal Artery
 - Maxillary Artery

Vertebral Arteries

- **Branch of Subclavian Arteries**
 - **Ascend through the transverse foramina of C6-C1**
- **Supply the posterior aspect of the brain**

Jugular Veins

- **Internal Jugular Veins**
 - **Typically largest of vascular structures of the neck**
- **Lateral to Carotid Artery**
- **Drain into:**
 - **Subclavian Vein** ↓
 - **Brachiocephalic** ↓
 - **Superior Vena Cava**

