# Thorax

*Competency achievement*: The student should be able to: AN 21.1: Identify and describe the salient features of sternum, typical rib, Ist rib and typical thoracic vertebra

# BONES

#### **Typical Rib**



Features of a typical rib



Draw attachments and relations of first rib

*Competency achievement*: The student should be able to: AN 21.2: Identify and describe the features of 2nd, 11th and 12th ribs, 1st, 11th and 12th thoracic vertebrae

#### **Twelfth Rib**



# Sternum



Features of sternum (anterior aspect)

Muscular attachments of anterior surface of sternum



Muscular attachments and relations of posterior aspect of sternum





Superior aspect

Lateral aspect

*Competency achievement:* The student should be able to: **AN 21.9:** Describe and demonstrate mechanics and types of respiration

Write briefly with diagram movements during respiration: Pump-handle movement (3rd–6th rib):

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Bucket-handle movement (7th–10th rib):





*Competency achievement*: The student should be able to: **AN 21.4:** Describe and demonstrate extent, attachments, direction of fibres, nerve supply and actions of intercostal muscles

# WALL OF THORAX

## Nerve Supply and Actions of the Intercostal Muscles

Muscle	Nerve supply	Action
External intercostal		
Internal intercostal		
Transversus thoracis		
A. Subcostalis		
B. Innermost intercostal		
C. Sternocostalis		



Section through intercostal space

*Competency achievement*: The student should be able to:

**AN 21.5:** Describe and demonstrate origin, course, relations and branches of a typical intercostal nerve **AN 21.6:** Mention origin, course and branches/ tributaries of:

- 1. Anterior and posterior intercostal vessels
- 2. Internal thoracic vessels



Scheme showing the course and branches of typical intercostal nerve and intercostal arteries

*Competency achievement*: The student should be able to:

AN 23.3: Describe and demonstrate origin, course, relations, tributaries and termination of superior vena cava, azygos, hemiazygos and accessory hemiazygos veins

AN 23.4: Mention the extent, branches and relations of arch of aorta and descending thoracic aorta



Veins of the posterior thoracic wall



Branches of arch of aorta

# CLINICAL ANATOMY

Herpes zoster:

Tuberculosis of vertebra:



Possible paths of cold abscess (due to TB of vertebra) along the branches of spinal nerve

# PLEURA

*Competency achievement*: The student should be able to:

AN 24.1: Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy

#### **Comparison of Visceral and Parietal Pleura**

Features	Visceral	Parietal
Development		
Position		
Nerve supply		
Sensitivity		
Blood supply		
Lymph drainage		

## Write briefly about (locations mentioned) where the parietal pleura extends beyond the costal margins:

1. Right and left cervical dome of pleura:

2. Right xiphicostal angle:

3. Right and left costovertebral angles:

# **CLINICAL ANATOMY**

Why is the needle for paracentesis thoracis inserted in the lower part of the intercostal space?

LUNG

*Competency achievement*: The student should be able to: **AN 24.6:** Describe the extent, length, relations, blood supply, lymphatic drainage and nerve supply of trachea

# The Trachea and Lungs (Anterior Aspect)



The trachea and lungs as seen from the front



Impressions on the mediastinal surface of the right lung



Impressions on the mediastinal surface of the left lung

<b>AN 24.2:</b> Identify side, external features and relations of structures	which form root of lung and bronchial tree and their clinical correlate			
Draw diagrams of roots of right and left lungs				
Right	Left			

*Competency achievement*: The student should be able to: **AN 24.3:** Describe a bronchopulmonary segment

# **Bronchopulmonary Segments**

Define bronchopulmonary segment:





# Diagram of Bronchopulmonary Segments of Lungs

# CLINICAL ANATOMY

1. Why do aspirated foreign bodies pass into the right principal bronchus?

2. Visceral pleura is not sensitive to pain whereas parietal pleura is sensitive to pain. Why?

*Competency achievement*: The student should be able to: **AN 21.11:** Mention boundaries and contents of the superior, anterior, middle and posterior mediastinum

# **MEDIASTINUM**

**Enumerate the boundaries and contents of the superior mediastinum** Boundaries:

Contents:



Subdivisions of mediastinum



Arrangement of the large structures in superior mediastinum



Structures in the posterior part of the superior mediastinum

*Competency achievement*: The student should be able to: **AN 22.1:** Describe and demonstrate subdivisions, sinuses in pericardium, blood supply and nerve supply of pericardium

# PERICARDIUM AND HEART

Sinuses of the Pericardium



Heart-Label borders, surfaces and grooves

The pericardial cavity after removal of heart



Gross features: Sternocostal surface of heart



The posterior aspect of heart

*Competency achievement*: The student should be able to: **AN 22.2:** Describe and demonstrate external and internal features of each chamber of heart

## **Right Atrium**

Enumerate the veins opening in the right atrium

Draw	diagram	of	interior	of	right atrium	

# Comparison of the Right Atrium and Left Atrium

Right atrium	Left atrium

## Left Ventricle

Surfaces of left ventricle:

Orifices in the left ventricle:

# Comparison of the Right Ventricle and Left Ventricle

Right ventricle	Left ventricle		

# Flow Diagram of Blood Circulation through the Heart

Superior and inferior vena	cavae ←	Tissues of the b	ody	$\leftarrow$	Aorta
$\downarrow$					↑
Right atrium					Left ventricle
$\downarrow$					↑
Tricuspid valve					Bicuspid valve
$\downarrow$					↑
Right ventricle					Left atrium
$\downarrow$					↑
Pulmonary trunk $\rightarrow$	Pulmonary an	tery $\rightarrow$ 1	Lungs	$\rightarrow$	Pulmonary veins

Draw diagram showing ventricles of heart				
Right ventricle	Left ventricle			
Right ventricle	Left ventricle			

*Competency achievement*: The student should be able to:AN 22.3: Describe and demonstrate origin, course and branches of coronary arteriesAN 22.5: Describe and demonstrate the formation, course, tributaries and termination of coronary sinus

# Comparison of the Right and Left Coronary Arteries

Feature	Right coronary artery	Left coronary artery
Origin		
Course		
Termination		
Branches		

Draw diagram showing arteries of the heart				
Anterior aspect	Posterior aspect			

Draw diagram showing veins of the heart				
Anterior aspect	Posterior aspect			

Enumerate the relations of arch of aorta:

*Competency achievement*: The student should be able to:

AN 23.2: Describe and demonstrate the extent, relations tributaries of thoracic duct and enumerate its applied anatomy AN 23.7: Mention the extent, relations and applied anatomy of lymphatic duct

# OESOPHAGUS AND THORACIC DUCT

## Enumerate the relations of thoracic part of oesophagus

Anterior	Posterior	Right	Left

Regions drained by the thoracic duct and right lymphatic duct

Draw diagram showing transverse section of thorax through third thoracic vertebra

Draw diagram transverse section of thorax through fourth thoracic vertebra showing relations of arch of arota

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*Competency achievement*: The student should be able to: **AN 22.4:** Describe anatomical basis of ischaemic heart disease

# CLINICAL ANATOMY

### Write briefly

1. Pericardial effusion:

2. Angina pectoris and referred pain:

3. Myocardial infarction:

4. Natural constrictions of oesophagus: