Thorax
Thoracic Anatomy

What is the Thorax?
Thoracic Body Wall Muscles

Recall the Pattern of Muscle Design!
Thoracic Body Wall Muscles

Applying the Pattern to Hypaxial Muscles
Thoracic Body Wall Muscles

Ventral Musculature

Sternalis muscle
Thoracic Body Wall Muscles

**Lateral Musculature**

- Supracostal or outermost muscle layer
- Serratus posterior superior
- Serratus posterior inferior
- Other members of this series - upper limb
Lateral Musculature

External muscle layer
External intercostal muscle
Thoracic Body Wall Muscles

Lateral Musculature

Middle muscle layer
Internal intercostal muscle
Lateral Musculature

Internal muscle layer
Transversus thoracic muscles
Thoracic Body Wall Muscles

**Lateral Musculature**

Internal muscle layer

Innermost intercostal muscles
Thoracic Body Wall Muscles

**Lateral Musculature**

- Internal muscle layer
- Subcostal muscles
Thoracic Body Wall Muscles

Lateral Musculature

Internal muscle layer

Diaphragm
Thoracic Body Wall Muscles

Subvertebral Musculature

Longus colli muscle
Functional Significance of Thoracic Muscles

Phylogenetic considerations
Thoracic Body Wall Muscles

**Functional Significance of Thoracic Muscles**

- Human considerations
- Movements of the rib cage
Functional Significance of Thoracic Muscles

Human considerations
Respiratory movements
Summary of Thoracic Muscles
Thoracic Wall Vascular Patterns
Posterior Supply Vessels
Thoracic Wall Vascular Patterns

Collateral Vessels
Thoracic Wall Vascular Patterns

Collateral Vessels

Normal flow
Collateral Vessels
Collateral flow
Collateral Vessels
Lateral Vessels
Arterial Supply of Thoracic Wall

Posterior Supply Vessels

Aorta
Arterial Supply of Thoracic Wall

Posterior Supply Vessels

Posterior intercostal arteries
Arterial Supply of Thoracic Wall

Posterior Supply Vessels

Superior phrenic arteries
Arterial Supply of Thoracic Wall

Anterior Supply Vessels
Subclavian arteries
Arterial Supply of Thoracic Wall

Anterior Supply Vessels

Internal thoracic arteries
Arterial Supply of Thoracic Wall

**Anterior Supply Vessels**

Anterior intercostal arteries
Arterial Supply of Thoracic Wall

**Anterior Supply Vessels**
Pericardiacophrenic arteries
Arterial Supply of Thoracic Wall

**Anterior Supply Vessels**

Musculophrenic arteries
Arterial Supply of Thoracic Wall

**Posterior Supply Vessels**

Aorta
Arterial Supply of Thoracic Wall

**Posterior Supply Vessels**

Posterior intercostal arteries
Arterial Supply of Thoracic Wall

**Posterior Supply Vessels**

Superior phrenic arteries
Arterial Supply of Thoracic Wall

**Anterior Supply Vessels**

Subclavian arteries
Arterial Supply of Thoracic Wall

**Anterior Supply Vessels**

Internal thoracic arteries
Arterial Supply of Thoracic Wall

**Anterior Supply Vessels**

Anterior intercostal arteries
Arterial Supply of Thoracic Wall

**Anterior Supply Vessels**
Pericardiacophrenic arteries
Arterial Supply of Thoracic Wall

Anterior Supply Vessels
Musculophrenic arteries
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Superior vena cava

What is the problem here?
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Azygos vein
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Right superior intercostal vein
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Right posterior intercostal veins
Venous Drainage of Thoracic Wall

Posterior Drainage Vessels

Hemiazygos vein
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Left posterior intercostal veins
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Accessory hemiazygos vein
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Left posterior intercostal veins
Venous Drainage of Thoracic Wall

Posterior Drainage Vessels

Left brachiocephalic vein
Venous Drainage of Thoracic Wall

Posterior Drainage Vessels

Left superior intercostal vein
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

- Internal thoracic veins
- How does this differ from the arteries?
Venous Drainage of Thoracic Wall

**Anterior Drainage Vessels**

Anterior intercostal veins
Venous Drainage of Thoracic Wall

**Anterior Drainage Vessels**

Pericardiacophrenic veins
Anterior Drainage Vessels
Musculophrenic veins
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Superior vena cava
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Azygos vein
Posterior Drainage Vessels

Right superior phrenic vein
Into what does this vein drain?
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Right superior intercostal veins
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Right posterior intercostal veins
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Hemiazygos vein
Venous Drainage of Thoracic Wall

**Posterior Drainage Vessels**

Accessory hemiazygos vein
Venous Drainage of Thoracic Wall

**Anterior Drainage Vessels**

Superior vena cava from brachiocephalic veins
Venous Drainage of Thoracic Wall

Anterior Drainage Vessels

Internal thoracic veins
Venous Drainage of Thoracic Wall

**Anterior Drainage Vessels**

Anterior intercostal veins
Venous Drainage of Thoracic Wall

**Anterior Drainage Vessels**

Pericardiacophrenic viens
Venous Drainage of Thoracic Wall

**Anterior Drainage Vessels**

Musculophrenic veins
Innervation of Thoracic Wall

Review of Spinal Nerve
Innervation of Thoracic Wall

**Intercostal Nerves**

Main branch
Innervation of Thoracic Wall

**Intercostal Nerves**
Collateral branch
Innervation of Thoracic Wall

**Intercostal Nerves**

Lateral cutaneous branch
Innervation of Thoracic Wall

**Intercostal Nerves**

Anterior cutaneous branch
Innervation of Thoracic Wall

Phrenic Nerve
Intercostal VAN

Between which layers are these structures found?
Cavity versus Coelom
Thoracic Cavity

Three Coeloms in One Cavity
Thoracic Cavity

Remember the Fist-in-the-Balloon
Thoracic Coeloms and Membranes

Pleural Sacs and the Lungs
Pleural Sacs and the Lungs

Visceral pleura
What kind of tissue is it?
Thoracic Coeloms and Membranes

**Pleural Sacs and the Lungs**

Parietal pleura
What kind of tissue is it?
Pleural Sacs and the Lungs

Pleural cavity

Is there anything in this cavity?
Pericardial Sac and the Heart

Visceral pericardium
What kind of tissue is it?
Thoracic Coeloms and Membranes

**Pericardial Sac and the Heart**

Parietal pericardium
What kind of tissue is it?
Thoracic Coeloms and Membranes

Pericardial Sac and the Heart

Pericardial cavity

Is there anything in this cavity?
Pericardial Sac and the Heart

Fibrous pericardium
What is this?
What is the Mediastinum
Arterial Supply to Thoracic Viscera

 Mediastinal Arteries
Arterial Supply to Thoracic Viscera

**Mediastinal Arteries**

Bronchial arteries
Arterial Supply to Thoracic Viscera

Mediastinal Arteries

Esophageal arteries
Venous Drainage of Thoracic Viscera

**Mediastinal Veins**

Azygos system of veins
Venous Drainage of Thoracic Viscera

**Mediastinal Veins**

Bronchial veins
Venous Drainage of Thoracic Viscera

**Mediastinal Veins**

Esophageal veins
Venous Drainage of Thoracic Viscera

**Mediastinal Veins**

From the left side
Innervation of Thoracic Viscera

Sympathetic Nerves
Innervation of Thoracic Viscera

Parasympathetic Nerves