Abdomen
Abdominal Body Wall Muscles

Recall the Pattern of Muscle Design!
Abdominal Body Wall Muscles

**Ventral Musculature**

- Rectus abdominis muscle
- Tendinous intersections
- Linea alba
Abdominal Body Wall Muscles

**Lateral Musculature**

Supracostal and external layers
External oblique muscle
Aponeurosis
Inguinal ligament
Abdominal Body Wall Muscles

**Lateral Musculature**

- Middle muscle layer
- Internal oblique muscle
- Aponeurosis
Abdominal Body Wall Muscles

**Lateral Musculature**

- Internal muscle layer
- Transversus abdominis muscle
- Aponeurosis
Abdominal Body Wall Muscles

**Lateral Musculature**

Internal muscle layer
Quadratus lumborum
Abdominal Body Wall Muscles

Subvertebral Musculature

Psoas major muscle
Abdominal Body Wall Muscles

Subvertebral Musculature

Psoas minor muscle
Functional Significance of Abdominal Muscles

Dynamic retaining wall
Abdominal Body Wall Muscles

Cross Section of the Abdominal Wall

Rectus sheath
Abdominal Body Wall Muscles

Summary of Abdominal Muscles
Arterial Supply of Abdominal Wall

Posterior Supply Vessels
Arterial Supply of Abdominal Wall

Posterior Supply Vessels

Inferior phrenic arteries
Arterial Supply of Abdominal Wall

Posterior Supply Vessels

Lumbar arteries
Arterial Supply of Abdominal Wall

**Anterior Supply Vessels**

Superior epigastric arteries
Arterial Supply of Abdominal Wall

**Anterior Supply Vessels**

Inferior epigastric arteries
Arterial Supply of Abdominal Wall

Posterior Supply Vessels

Aorta
Arterial Supply of Abdominal Wall

**Posterior Supply Vessels**

Inferior phrenic arteries
Arterial Supply of Abdominal Wall

Posterior Supply Vessels

Lumbar arteries
Arterial Supply of Abdominal Wall

Anterior Supply Vessels
Superior epigastric arteries
Arterial Supply of Abdominal Wall

**Anterior Supply Vessels**

Inferior epigastric arteries
Arterial Supply of Abdominal Wall

Collateral Vessels
Venous Drainage of Abdominal Wall

Posterior Drainage Vessels

Inferior vena cava
Venous Drainage of Abdominal Wall

Posterior Drainage Vessels

Lumbar veins
Venous Drainage of Abdominal Wall

**Posterior Drainage Vessels**

Ascending lumbar veins
Venous Drainage of Abdominal Wall

Posterior Drainage Vessels

Lumbar veins
Venous Drainage of Abdominal Wall

**Anterior Drainage Vessels**

Superior epigastric veins
Venous Drainage of Abdominal Wall

Anterior Drainage Vessels

Inferior epigastric veins
Venous Drainage of Abdominal Wall

Posterior Drainage Vessels

Inferior vena cava
Venous Drainage of Abdominal Wall

Posterior Drainage Vessels
Lumbar veins
Venous Drainage of Abdominal Wall

Posterior Drainage Vessels

Inferior phrenic veins
Venous Drainage of Abdominal Wall

Posterior Drainage Vessels

Ascending lumbar veins
Venous Drainage of Abdominal Wall

**Posterior Drainage Vessels**

Lumbar veins
Venous Drainage of Abdominal Wall

Anterior Drainage Vessels
Superior epigastric veins
Venous Drainage of Abdominal Wall

**Anterior Drainage Vessels**

Inferior epigastric veins
Venous Drainage of Abdominal Wall

Collateral Vessels
Innervation of Abdominal Wall

Thoracic Spinal Nerves

- Intercostal nerves
- Subcostal nerve
Innervation of Abdominal Wall

**Lumbar Spinal Nerves**
- Iliohypogastric nerve
- Ilioinguinal nerve
- Genitofemoral nerve
Abdominal Cavity

**Embryonic Gut Anatomy**

- Body wall
- Abdominal cavity
- Urogenital ridge
- Peritoneal coelom and suspended gut tube
Abdominal Cavity

Peritoneal Coeloms

Parietal peritoneum
Abdominal Cavity

Peritoneal Coeloms

Visceral peritoneum
Abdominal Cavity
Peritoneal Coeloms
Mesentery
Retroperitoneal Viscera

What are peritoneal viscera?
Abdominal Cavity

Retroperitoneal Viscera

Primary retroperitoneal organs
Secondary retroperitoneal organs
Topography of the Abdominal Viscera

**Intact Abdominal Cavity**
Peritoneal organs visible
Topography of the Abdominal Viscera

**Cut Mesenteries**

Retroperitoneal organs exposed
Topography of the Abdominal Viscera

Viewing the Organs

Peritoneal stomach
Topography of the Abdominal Viscera

Viewing the Organs

Peritoneal liver
Topography of the Abdominal Viscera

Viewing the Organs

Retroperitoneal parcreas
Topography of the Abdominal Viscera

**Viewing the Organs**

Peritoneal spleen
Topography of the Abdominal Viscera

**Viewing the Organs**

- Retroperitoneal duodenum
- Peritoneal jejunum and ileum
Topography of the Abdominal Viscera

**Viewing the Organs**

- Retroperitoneal ascending colon
- Retroperitoneal descending colon
- Retroperitoneal rectum
- Peritoneal caecum
- Peritoneal transvers colon
- Peritoneal sigmoid colon
Topography of the Abdominal Viscera

**Additional Mesenteric Structures**
Topography of the Abdominal Viscera

Additional Mesenteric Structures

Parietal peritoneum
Topography of the Abdominal Viscera

Additional Mesenteric Structures

Visceral peritoneum
Topography of the Abdominal Viscera

Additional Mesenteric Structures

Mesenteries
Topography of the Abdominal Viscera

**Additional Mesenteric Structures**

Greater omentum
Topography of the Abdominal Viscera

Additional Mesenteric Structures

Lesser omentum
Topography of the Abdominal Viscera
Topography of the Abdominal Viscera

**Additional Mesenteric Structures**

Development of the greater omentum
Patterns of Gut Tube Blood Supply

Vascular Supply of Embryonic Gut
Patterns of Gut Tube Blood Supply

Vascular Supply of Embryonic Gut

Embryonic aorta
Patterns of Gut Tube Blood Supply

Vascular Supply of Embryonic Gut

Celiac trunk (artery)
Patterns of Gut Tube Blood Supply

Vascular Supply of Embryonic Gut

Superior mesenteric artery
Patterns of Gut Tube Blood Supply

Vascular Supply of Embryonic Gut

Inferior mesenteric artery
Patterns of Gut Tube Blood Supply

Vascular Supply of Embryonic Gut
Adoral and aboral branches
Patterns of Gut Tube Blood Supply

Arterial Supply to Adult Gut
Patterns of Gut Tube Blood Supply

**Arterial Supply to Adult Gut**

Celiac trunk (artery)
Patterns of Gut Tube Blood Supply

Arterial Supply to Adult Gut

Superior mesenteric artery
Patterns of Gut Tube Blood Supply

**Arterial Supply to Adult Gut**

Inferior mesenteric artery
Arterial Supply to Urogenital Anatomy

Renal arteries
Arterial Supply to Urogenital Anatomy

- Gonadal arteries
- Testicular arteries in male
- Ovarian arteries in female
Arterial Supply to Foregut

Concept of Adoral and Aboral Branches
Arterial Supply to Foregut

Concept of Adoral and Aboral Branches

Celiac trunk (artery)
Concept of Adoral and Aboral Branches

Left gastric artery
Concept of Adoral and Aboral Branches

Esophageal artery (adoral)
Concept of Adoral and Aboral Branches

Left gastric artery (aboral)
Concept of Adoral and Aboral Branches

Splenic artery
Concept of Adoral and Aboral Branches

Short gastric arteries (adoral)
Arterial Supply to Foregut

**Concept of Adoral and Aboral Branches**

Left gastro-omentinal artery (aboral)
Concept of Adoral and Aboral Branches

Hepatic artery (common and proper)
Concept of Adoral and Aboral Branches

Right gastric artery (adoral)
Arterial Supply to Foregut

**Concept of Adoral and Aboral Branches**

Gastroduodenal artery (aboral)
Arterial Supply to Foregut

**Concept of Adoral and Aboral Branches**

Right gastro-oment al artery (adoral)
Arterial Supply to Foregut

Concept of Adoral and Aboral Branches

Pancreaticoduodenal artery (aboral)
Venous Drainage of Abdominal Viscera

**Visceral Tributaries to Inferior Vena Cava**

Where are all the gut tube veins?
Visceral Tributaries to Inferior Vena Cava

Hepatic veins
Venous Drainage of Abdominal Viscera

**Visceral Tributaries to Inferior Vena Cava**

Renal veins
Venous Drainage of Abdominal Viscera

Visceral Tributaries to Inferior Vena Cava

- Gonadal veins
- Testicular veins in male
- Ovarian veins in female
Venous Drainage of Abdominal Viscera

**Hepatic Portal System**

What is a portal system?
Venous Drainage of Abdominal Viscera

Hepatic Portal System

Elements of the hepatic portal system
Venous Drainage of Abdominal Viscera

Hepatic Portal System
Venous Drainage of Abdominal Viscera

**Hepatic Portal System**
Hepatic portal vein
Venous Drainage of Abdominal Viscera

Hepatic Portal System

Left gastric vein
Venous Drainage of Abdominal Viscera

**Hepatic Portal System**

Right gastric vein
Venous Drainage of Abdominal Viscera

Hepatic Portal System

Splenic vein
Venous Drainage of Abdominal Viscera

Hepatic Portal System
Inferior mesenteric vein
Venous Drainage of Abdominal Viscera

**Hepatic Portal System**

Left gastro-omental vein
Venous Drainage of Abdominal Viscera

Hepatic Portal System
Superior mesenteric vein
Venous Drainage of Abdominal Viscera

Hepatic Portal System
Right gastro-omental vein
Venous Drainage of Abdominal Viscera

**Hepatic Portal System**

Hepatic sinusoids
Venous Drainage of Abdominal Viscera

**Hepatic Portal System**

Hepatic veins
Innervation of Abdominal Viscera

Sympathetic Nerves
Innervation of Abdominal Viscera

**Parasympathetic Nerves**

Vagus nerve

Innervates foregut and midgut
Parasympathetic Nerves

Sacral parasympathetic splanchnic nerves
Innervates hindgut