Gut Tube: Development, Structure, Function
咽頭と喉頭

（講談社 からだの地図帳より）

鼻中隔
咽頭扁桃
耳管
軟口蓋
口蓋垂
口蓋扁桃
喉頭蓋
喉頭蓋軟骨
甲状腺軟骨
輪状軟骨
仮声帯
声帯
気管
食道
1. Implications of Gut Development
   Foregut Development
   Midgut Development
   Hindgut Development

2. Circulation – Part I
Dorsal vs. Ventral Mesentery Components
Early Development of the Stomach
Continued Development of the Stomach
Rotation of the Foregut
Development of diverticula of the foregut
Pancreas Development

- Liver buds
- Gallbladder
- Superior mesenteric artery
- Aorta
- Common bile duct
- R. & L. hepatic ducts
- Common hepatic duct
- Cystic duct
- Pancreatic duct
- Pancreas (outline)
Development of Diverticula of Foregut

- Hepatic Diverticulum

- Pancreas originally two separate lobes (ventral part of hepatic diverticulum, dorsal independent.)

- Rotation brings dorsal (tail) and ventral components of pancreas together.
Development of Diverticula of Foregut

- **Hepatic Diverticulum**

- Pancreas originally two separate lobes (ventral part of hepatic diverticulum, dorsal independent.

- Rotation brings dorsal (tail) and ventral components of pancreas together.
Development of Diverticula of Foregut

• Hepatic Diverticulum

• Pancreas originally two separate lobes (ventral part of hepatic diverticulum, dorsal independent.

• Rotation brings dorsal (tail) and ventral components of pancreas together.
Development of Diverticula of Foregut

- Hepatic Diverticulum

- Pancreas originally two separate lobes (ventral part of hepatic diverticulum, dorsal independent).

- Rotation brings dorsal (tail) and ventral components of pancreas together.
Fig. 969  Position of the viscera in the upper abdomen, ventral view. Parts of the diaphragm and the anterior thoracic and abdominal walls have been removed.

This part of the abdominal cavity is also known as the "glandular abdomen."

* Also: Foramen of WINSLOW
** Omental bursa partially opened
Liver
Stomach
Liver:

Dorsal View

Ventral View

Ligamentum teres (= old ductus venosus)
Foregut - Neurovascular Service:

Unpaired Branch of Abdominal Aorta: Celiac Artery

Unpaired Tributary of Hepatic Portal Vein: Splenic Vein

Sympathetic Nerve: Greater Splanchnic Nerve
Sympathetic Nerve Segmental Levels: T5-9
Sympathetic Ganglion: Celiac Ganglion

Parasympathetic Nerve: Vagus Nerve (CN – X)
1. Implications of Gut Development
   Foregut Development
   Midgut Development
   Hindgut Development

2. Circulation – Part I
Dorsal vs. Ventral Mesentery Components

ventral mesogastrium

BA

dorsal mesentery
“Repackaging” of the Midgut
Retroperitoneal components of abdominal cavity
Midgut - Neurovascular Service:

Unpaired Branch of Abdominal Aorta: Superior Mesenteric Artery

Unpaired Tributary of Hepatic Portal Vein: Superior Mesenteric Vein

Sympathetic Nerve: Lesser Splanchnic Nerve

Sympathetic Nerve Segmental Levels: T10-11

Sympathetic Ganglion: Superior Mesenteric Ganglion

Parasympathetic Nerve: Vagus Nerve (CN – X)
1. Implications of Gut Development
   - Foregut Development
   - Midgut Development
   - Hindgut Development

2. Circulation – Part I
Review of Retroperitoneal components of abdominal cavity
Innervation of Bladder

Sympathetic: predominantly L1-2 via hypogastric plexus

Parasympathetic: S2-4 (as you would expect of a hindgut derivative).
Hepatic Portal Vein and Its Tributaries
Sympathetic Supply of the Abdominal Gut
Parasympathetic Supply to the Hindgut: S2-4)
Hindgut - Neurovascular Service:

Unpaired Branch of Abdominal Aorta: Inferior Mesenteric Artery

Unpaired Tributary of Hepatic Portal Vein: Inferior Mesenteric Vein

Sympathetic Nerve: Least Splanchnic Nerve + Lumbar splanchnics

Sympathetic Nerve Segmental Levels: T12, L1(2)

Sympathetic Ganglion: Superior Mesenteric Ganglion

Parasympathetic Nerve: Pelvic Outflow, S2-4
## Foregut, Midgut, & Hindgut Summary

<table>
<thead>
<tr>
<th>Embryonic Gut</th>
<th>Boundaries</th>
<th>Sympathetic nerve</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foregut</td>
<td>Through first ½ of duodenum</td>
<td>Greater Splanchnic</td>
<td>T5-9</td>
</tr>
<tr>
<td>Midgut</td>
<td>2nd ½ of duodenum through left colic flexure</td>
<td>Lesser Splanchnic</td>
<td>T10-11</td>
</tr>
<tr>
<td>Hindgut</td>
<td>Left colic flexure to anus</td>
<td>Least Splanchnic + Lumbar splanchnics</td>
<td>T12, L1(2)</td>
</tr>
<tr>
<td>Embryonic gut</td>
<td>Preaortic ganglia</td>
<td>Arteries of Abdominal aorta</td>
<td>Hepatic portal vein</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------</td>
<td>------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Foregut</td>
<td>Celiac ganglion</td>
<td>Celiac artery</td>
<td>Splenic vein</td>
</tr>
<tr>
<td>Midgut</td>
<td>Superior mesenteric ganglion</td>
<td>Superior mesenteric artery</td>
<td>Superior mesenteric vein</td>
</tr>
<tr>
<td>Hindgut</td>
<td>Inferior mesenteric ganglion</td>
<td>Inferior mesenteric artery</td>
<td>Inferior mesenteric vein</td>
</tr>
</tbody>
</table>