# Lymphatic Drainage of Abdominopelvic Organs

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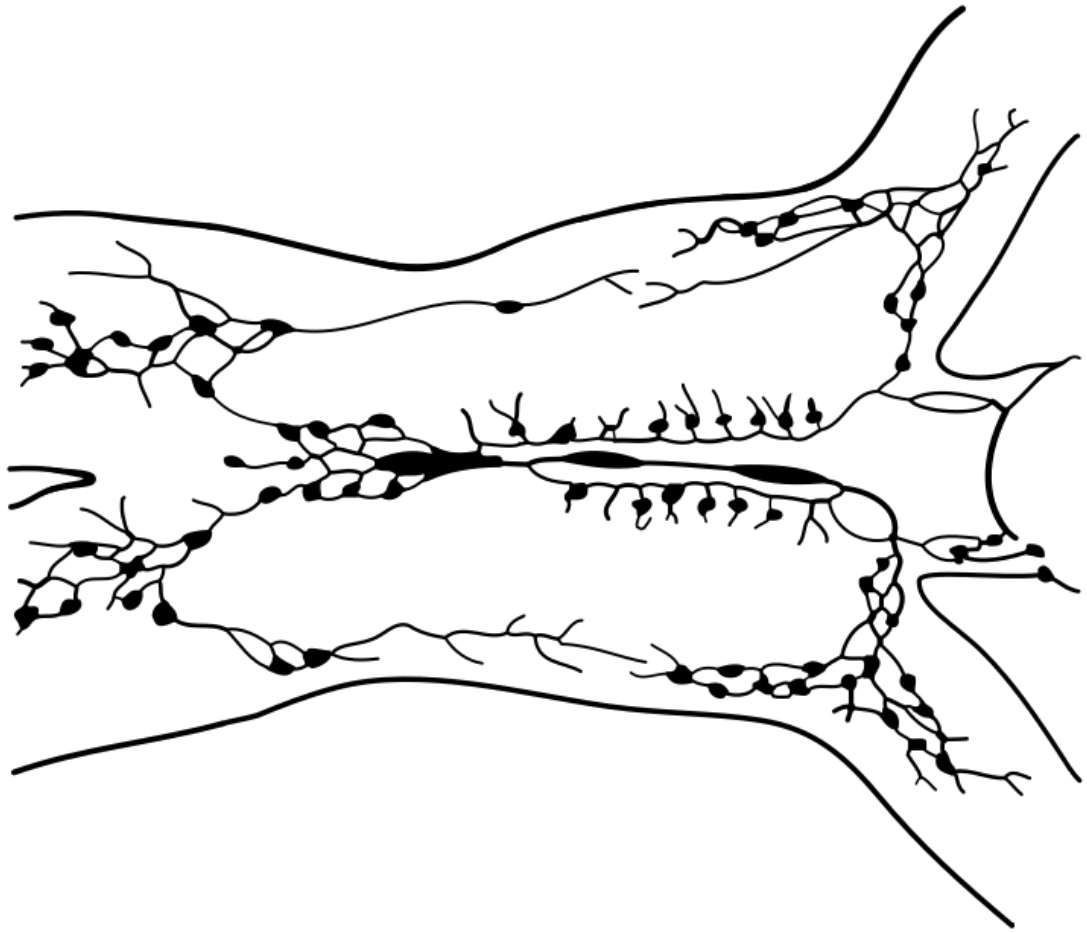
**The lymphatic drainage of the abdominopelvic organs can be described easily by dividing the drainage into four groups. The lymphatic drainage from these organs is clinically very important due to its role in the spread of malignancies and infections.**



## Lymphatic Drainage From the Infra-diaphragmatic Portion of the Gastrointestinal Tract

The lymphatics of the gastrointestinal viscera are located within their **mucous membranes** and their **serous walls**.

## Lymphatic drainage of the stomach

The lymph around the **cardiac opening of the stomach** drains into the **lower esophageal lymph nodes** while the lymph from around the **pylorus** drains into the **lymph glands around the duodenum**. The lymphatic drainage, in general, follows the blood vessels supplying the stomach and the drainage can be described in four groups:

**Group 1** receives lymph from the anterior and posterior surface of the stomach, accompanies the left gastric artery branches and drains into the superior gastric glands.

**Group 2** receives lymph from the body and fundus of the stomach, accompanies the left gastroepiploic and short gastric arteries to drain into the pancreaticoduodenal lymph nodes.

**Group 3** receives lymphatic drainage from the right side of the greater curvature of the stomach up to the pyloric end and drains into the inferior gastric glands, which subsequently drain into the subpyloric lymph nodes.

**Group 4** drains the pyloric region of the stomach and their efferents end in the superior gastric glands via the hepatic and subpyloric glands.

## Lymphatic drainage of the duodenum

Drainage of the duodenum consists of two groups: the anterior and the posterior group. Both groups drain into the **pancreaticoduodenal nodes** located between the duodenum and the pancreatic head. The efferents from the pancreaticoduodenal nodes drain superiorly into the **hepatic lymph nodes** and inferiorly into the **preaortic nodes** near the superior mesenteric artery origin.

## Lymphatic drainage of jejunum and ileum

This is situated between the two mesenteric layers and drains into the **preaortic lymph nodes** via the **mesenteric glands**. These lymphatics are also called **lacteals** due to their milky white content (lymph) during digestion.

## Lymphatic drainage of appendix and cecum

The walls of the appendix and cecum have a large amount of lymphoid/adenoid tissue and therefore they have **numerous lymphatic vessels**. Lymphatics from the body and tail of the appendix run through the **mesentery** to drain into the **upper and lower ileocolic lymph nodes.**

The lymph from the root of the appendix and the cecum drains into two groups: an anterior and a posterior group. The **anterior lymphatic vessels** run anterior to the cecum and drain into the **anterior, upper and lower ileocolic nodes** while the **posterior lymphatic vessels** run on the posterior surface of the cecum and drain into the **posterior and inferior ileocolic lymph nodes**.

## Lymphatic drainage of colon

The lymph from the ascending and transverse colon passes through the **mesocolic and right colic lymph nodes** to terminate in the **mesenteric lymph nodes**. The lymph vessels arising from the descending and sigmoid colon end in the **preaortic glands**, which are located near the origin of the inferior mesenteric artery.

## Lymphatic drainage of rectum, anal canal and anus

The rectal lymphatics pass through the **pararectal lymph nodes** to the **nodes in the sigmoid mesocolon**, which eventually drain into the **preaortic nodes**.

The lymphatics from the anal canal run along the **middle and inferior hemorrhoidal vessels** to drain into the **hypogastric lymph nodes**.

The lymphatics from the anus join the lymphatics from the perineum and the scrotum to drain into the **superficial inguinal lymph nodes**.

## Lymphatic drainage from the liver

The lymphatics from the liver can be classified as superficial and deep. The **superficial lymphatics** lie on the surface of the liver within the **subperitoneal areolar tissue** and can be further divided into the **lymphatics on the convex surface of the liver** and **lymphatics on the inferior surface of the liver**.

The **deep lymphatics** have an **ascending trunk** that runs along the hepatic veins and terminates in the **lymph nodes** around the inferior vena cava while those forming the descending trunk terminate in the **hepatic lymph nodes**.

**Lymphatics on the convex, posterior surface of the liver** travel along different routes:

Some lymphatics pass through the **diaphragm** along with the inferior vena cava to eventually drain into the lymph nodes along the terminal portion of the inferior vena cava

Lymphatics from the left side run posteriorly to the **esophageal hiatus of the diaphragm** and drain into the **paracardial lymph nodes** within the superior gastric nodes.

Lymphatics from the right side run along the **inferior surface of the diaphragm** and its right crus to drain into the **preaortic lymph nodes** around the celiac artery origin.

Lymphatics from the left and right lobes of the liver form two branches – one branch passes through the **diaphragm** along with the inferior vena cava to eventually drain into the lymph nodes along the terminal portion of the inferior vena cava; the second branch runs **antero-inferiorly around the sharp margin of the liver**, along the ligamentum teres to drain into the **hepatic lymph nodes**.

**Lymphatics on the inferior surface of the liver** meet at the **porta hepatis** and along with the lymphatics from the deep group drain into the **hepatic nodes**.

**Lymphatics from the caudate and right lobes of the liver** pass through the **diaphragm** along with the inferior vena cava to eventually drain into the lymph nodes along the terminal portion of the inferior vena cava.

## Lymphatic drainage from the gall bladder

Lymphatics from the **common bile duct** run along the duct and drain into the upper **pancreaticoduodenal lymph nodes** via the hepatic nodes while the lymph from the **gall bladder** drains into the **hepatic nodes**.

## Lymphatic drainage from the pancreas

Lymphatic drainage from the pancreas runs along its arteries with the majority of the lymph draining into the **pancreaticolienal lymph nodes** and a small part draining into the **pancreaticoduodenal and preaortic lymph nodes** in the vicinity of the superior mesenteric artery.

# Lymphatic Drainage From the Suprarenal Glands and the Spleen

The **superficial and deep lymphatics from the spleen** drain to the **pancreaticolienal lymph nodes**.

The **lymph from the suprarenal glands** is carried by lymphatics accompanying the suprarenal vessels and drains to the **lateral aortic lymph nodes**. A few lymphatics may drain in the **posterior mediastinal lymph nodes** after passing through the diaphragmatic crura.

# Lymphatic Drainage From the Organs of the Urinary System

## Lymphatic drainage from the kidneys

Lymphatic drainage from the kidneys occurs via three plexuses:

- First within the substance of the kidneys
- Second underneath its fibrous capsule
- Third within its perinephric fat.

The lymphatic vessels from the first and second plexus join at the **renal hilum** to drain in the **lateral aortic nodes** while the perinephric lymphatics drain into the **upper lateral aortic nodes** separately.

## Lymphatic drainage from the ureters

Lymphatic drainage from the **ureters** varies according to the location. The lymph from the upper ureters drains in the **renal efferents lymphatics** and partly into the **lateral aortic nodes**. The lymph from the mid-portion of the ureters drains into the **common iliac nodes** and the intrapelvic portion of the ureters drains into the **bladder afferents** or the **hypogastric nodes**.

## Lymphatic drainage from the bladder

Lymphatic drainage from the **bladder** arises within and outside the bladder musculature. The lymphatics from the anterior surface of the bladder drain into the **external iliac nodes** while those from the posterior surface drain into the **external and common iliac nodes** as well as the **hypogastric nodes**.

## Lymphatic drainage from the prostate

Lymphatic drainage from the prostate drains mainly to the **hypogastric nodes** and the **sacral nodes**. However, a few lymphatics from the posterior surface run to the **external iliac nodes** and a few from the anterior surface converge with **lymphatics draining the membranous urethra**.

## Lymphatic drainage from the urethra

The lymph from the cavernous part of the urethra drains along with lymph from the glans penis into the **deep subinguinal and external iliac nodes**. Lymph from the membranous and prostatic urethra in males and the entire urethra in females drains to the **hypogastric nodes**.

# Lymphatic Drainage From the Organs of the Reproductive System

## Lymphatic drainage from the organs of the male reproductive system

The lymph from the **tunica vaginalis** drains via **superficial lymphatics** while lymph from the testicular body and epididymis drains via **deep lymphatics**. The superficial and deep lymphatics run superiorly within the spermatic cord, anterior to the psoas muscle to the **lateral and preaortic lymph glands**.

Lymphatic drainage from the **ductus deferens** ends in the **external iliac lymph nodes** while the lymph from the **seminal vesicles** drains to the **hypogastric and the external iliac nodes**.

## Lymphatic drainage from the organs of the female reproductive system

Lymphatic drainage from the **ovaries** resembles the testicular lymph drainage. It accompanies the ovarian vessels and drains to the **lateral and preaortic lymph nodes**.

Lymphatic drainage from the **fallopian tubes** partly drains with the **ovarian lymphatics** and partly with the **uterine lymphatics**.

Lymphatic drainage from the **uterus** is formed by superficial lymphatics underneath the peritoneum and deep lymphatics within the substance of the uterus. Lymph from the uterine body and fundus mostly runs laterally within the broad ligament then superiorly along with the ovarian vessels to the **preaortic and lateral aortic lymph nodes** but some lymph drains to the **external iliac and superficial inguinal lymph glands**.

The lymph from the uterine cervix runs laterally to the **external iliac glands**, posteriorly to the **common iliac nodes** and posterolaterally to the **hypogastric glands**.

The lymphatics from the **vagina** communicate with lymphatics from the vulva, rectum and uterine cervix but do not anastomose with the bladder lymphatics. Lymphatics from the superior part of the vagina drain to the **external iliac nodes** while those from the middle portion drain to the **hypogastric nodes** and from the inferior part drain to the

**common iliac lymph nodes**. A few lymphatics from the inferior portion of the vagina converge with the vulvar lymphatics to drain into the **superficial inguinal lymph nodes**.

## Summary of lymphatic drainage

<table>
<tr><th>Organ</th><th colspan="3">Lymph nodes</th></tr>
<tr><td>Stomach</td><td>• Gastro-omental<br>• Pyloric<br>• Gastric</td><td>Coeliac</td><td rowspan="8">Intestinal lymphatic trunks</td></tr>
<tr><td>Duodenum</td><td>• Pancreaticoduodenal<br>• Pyloric</td><td rowspan="4">Superior mesenteric</td></tr>
<tr><td>Jejenum and ileum</td><td>• Mesenteric<br>• Iliocolic</td></tr>
<tr><td>Caecum and appendix</td><td>Iliocolic</td></tr>
<tr><td>Ascending colon</td><td>• Paracolic<br>• Right colic</td></tr>
<tr><td>Transverse colon</td><td>• Middle colic<br>• Mesocolic</td><td></td></tr>
<tr><td>Descending and sigmoid colon</td><td>Left colic</td><td rowspan="2">Inferior mesenteric</td><td></td></tr>
<tr><td>Rectum superior</td><td>Pararectal</td><td></td></tr>
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## Clinical Relevance

**Metastasis in the abdominopelvic cavity**: Malignancies within the abdomen and pelvis tend to spread easily and rapidly as the lymph nodes are interlinked and interconnected. Therefore knowledge of lymphatic drainage is crucial to the diagnosis and management of malignancies within the abdominopelvic cavity.

## References


The Lymphatics of the Abdomen and Pelvis via bartleby.com

Lymphatics of the Pelvis and Perineum via uams.edu

Lymphatic drainage via oganatomy.org

Lymphatics of the Pelvis and Perineum via ucd.ie




Notes