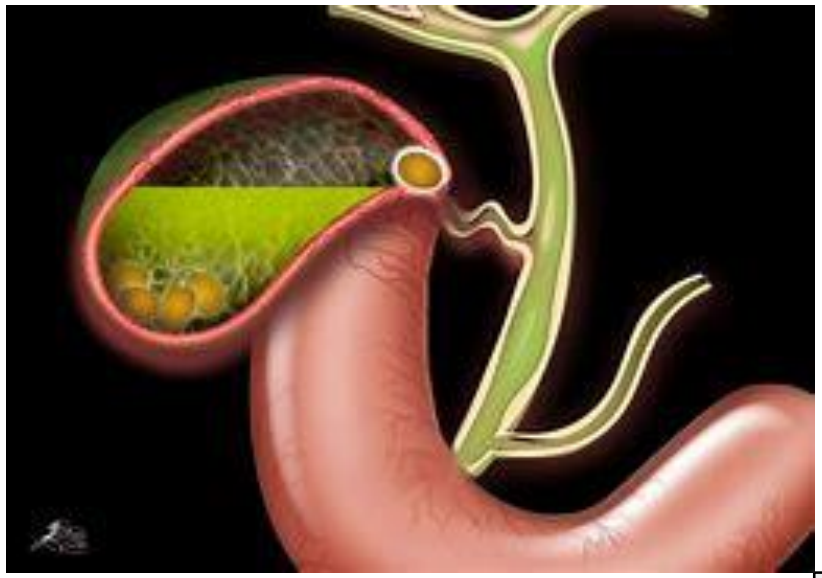
وزراة التعليم العالي والبحث العلمي
كلية المعارف الجامعة
قسم المختبرات الطبية

Gallbladder
Cholecystitis
Tumor



Histopathology
المرحلة الرابعة

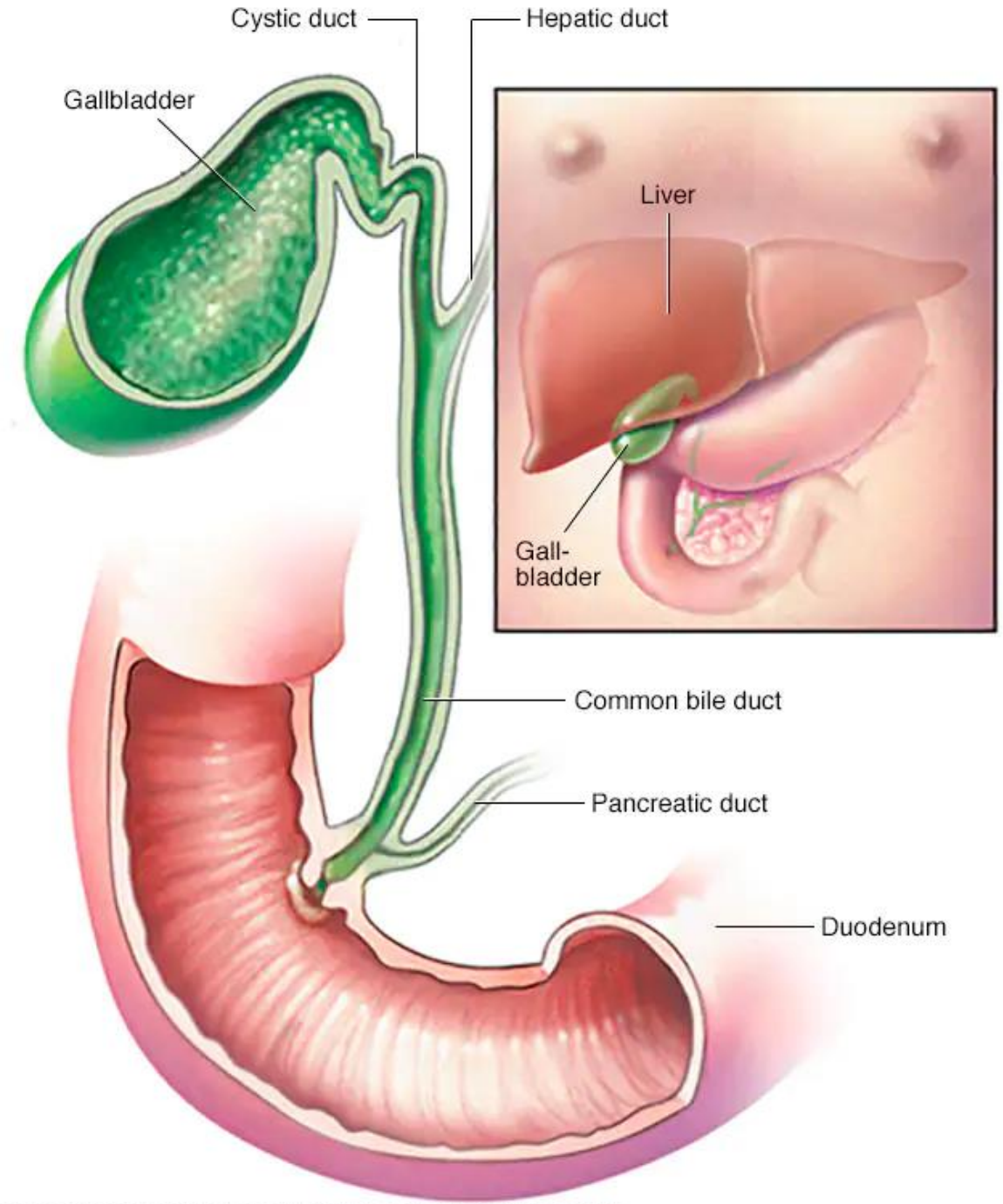
- **Cholecystitis** is inflammation of the gallbladder.
- The gallbladder is a small, pear-shaped organ on the right side of the belly (abdomen), beneath the liver. The gallbladder holds a digestive fluid (bile) that's released into the small intestine.
- Bile (from Latin bilis), or gall, is a yellow-green fluid produced by the liver of most vertebrates that aids the digestion of lipids in the small intestine. In humans, bile is primarily composed of water, produced continuously by the liver, and stored and concentrated in the gallbladder. After a human eats, this stored bile is discharged into the first section of the small intestine.

Composition

In the human liver, bile is composed of 97–98% water, 0.7% bile salts, 0.2% bilirubin, 0.51% fats (cholesterol, fatty acids, and lecithin), and 200 meq/L inorganic salts. The two main pigments of bile are bilirubin, which is yellow, and its oxidised form biliverdin, which is green. When mixed, they are responsible for the brown color of feces. About 400 to 800 milliliters (14 to 27 U.S. fluid ounces) of bile is produced per day in adult human beings.

- In most cases, gallstones blocking the tube leading out of the gallbladder cause cholecystitis. This results in a bile buildup that can cause inflammation. Other causes of cholecystitis include bile duct problems, tumors, serious illness, and certain infections.

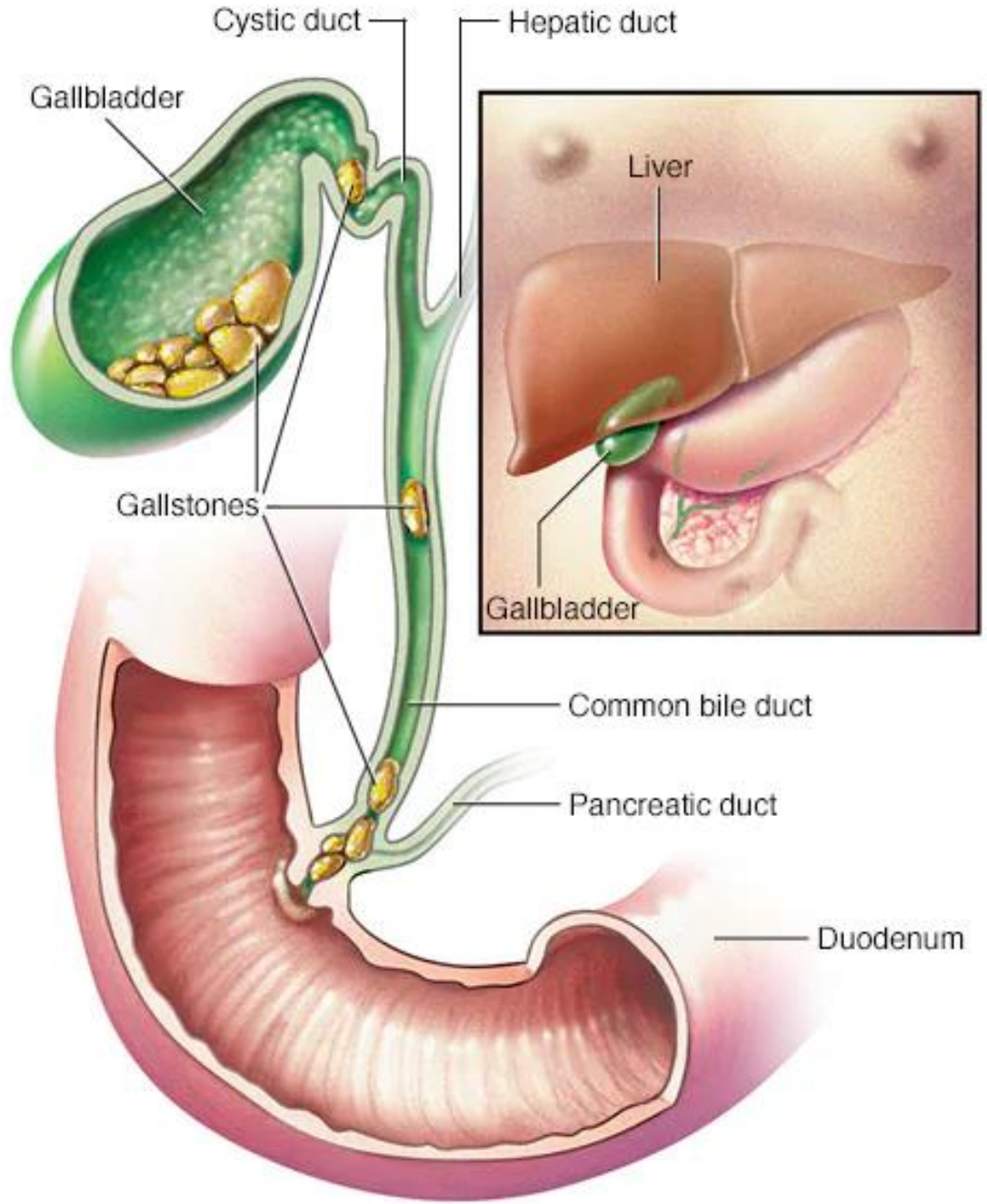
- If left untreated, cholecystitis can lead to severe, sometimes life-threatening complications, such as a gallbladder rupture. Treatment for cholecystitis often involves surgery to remove the gallbladder.



- **Symptoms of cholecystitis may include:**
- Severe pain in the upper right or center abdomen
- Pain that spreads to the right shoulder or back
- Tenderness over the abdomen when it's touched
- Nausea
- Vomiting
- Fever

Causes

- **Gallstones.** Cholecystitis often results from hard particles that develop in the gallbladder (gallstones). Gallstones can block the tube (cystic duct) through which bile flows when it leaves the gallbladder. Bile builds up in the gallbladder, causing inflammation.
- **Tumor**. A tumor may prevent bile from draining out of the gallbladder properly. This causes bile buildup that can lead to cholecystitis.
- **Bile duct blockage**. Stones or thickened bile and tiny particles (sludge) can block the bile duct and lead to cholecystitis. Kinking or scarring of the bile ducts can also cause blockage.
- **Infection.** AIDS and certain viral infections can trigger gallbladder inflammation.
- **Severe illness.** Very severe illness can damage blood vessels and decrease blood flow to the gallbladder, leading to cholecystitis.



There are two types of cholecystitis:

Acute cholecystitis is the sudden inflammation of the gallbladder that causes marked abdominal pain, often with nausea, vomiting, and fever.

Chronic cholecystitis is a lower-intensity inflammation of the gallbladder that lasts a long time. It may be caused by repeat attacks of acute cholecystitis. Chronic cholecystitis may cause intermittent mild abdominal pain or no symptoms at all. Damage to the walls of the gallbladder leads to a thickened, scarred gallbladder. Ultimately, the gallbladder can shrink and lose its ability to store and release bile.

- **Pathophysiology**

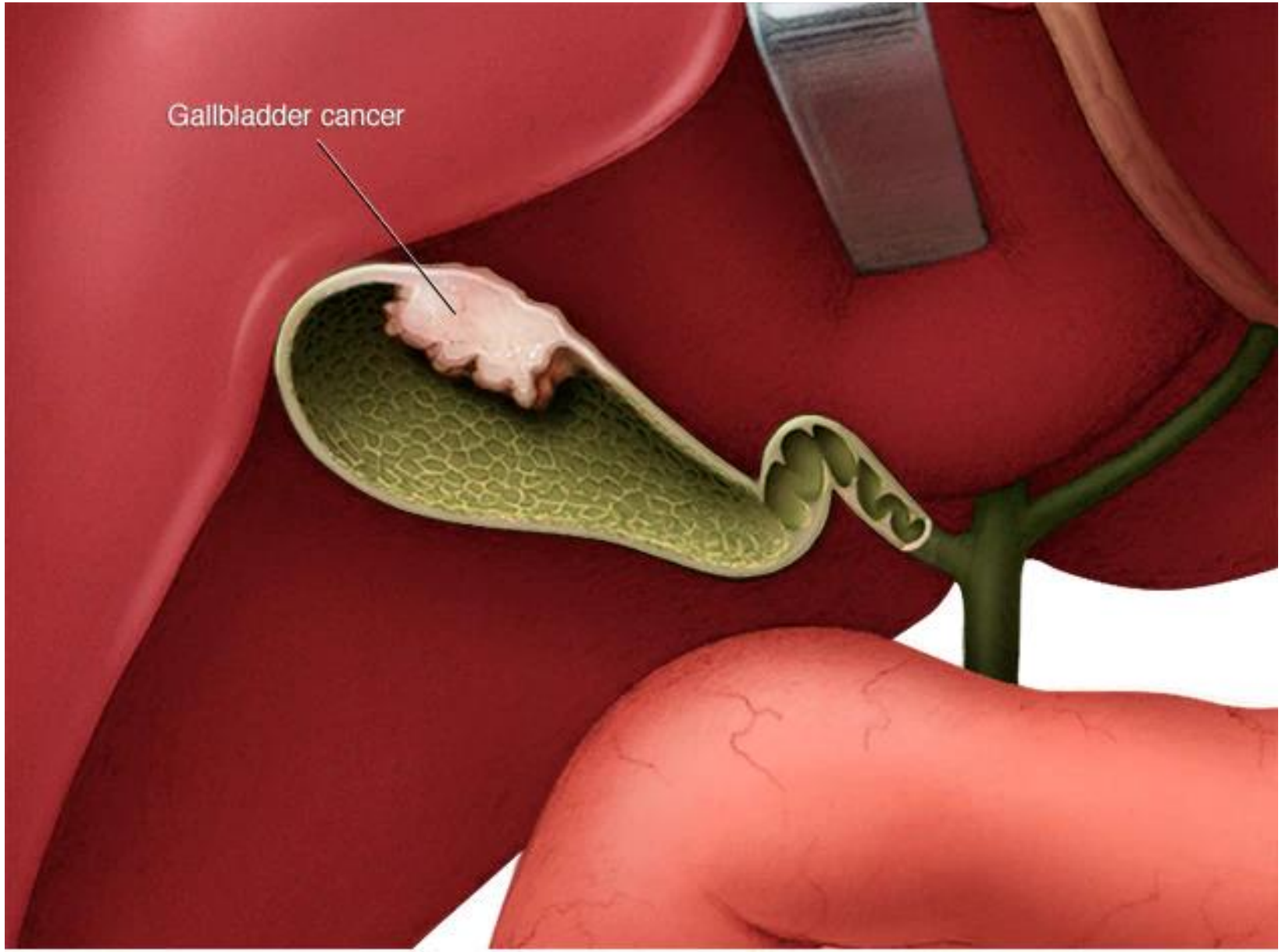
- **Calculous**
  - Blockage of the neck or cystic duct
    - Typically by gallstones or biliary sludge
    - Continued production of mucus by gallbladder with no outlet
  - Increased pressure within the gallbladder
  - Venous stasis
  - Arterial stasis
  - Gallbladder ischemia and necrosis
  - **Acalculous**
  - Bile stasis and ischemia not provoked by a physical blockade of the cystic duct
    - Ischemia due to:
      - Activated factor XII
      - No collateral blood supply; complete reliance on cystic artery

- **Gross description**
- Distention / edema of gallbladder
- Serosa
  - Exudate
  - Color alteration
  - Hemorrhagic
- Wall
  - Thickened up to 2 cm
  - Edematous
  - Hemorrhagic
- Mucosa
  - May see ulcers
- Lumen
  - May see bile, hemorrhage, fluid mixture of cholesterol and calcium carbonate

- **Microscopic (histologic) description**
- May not see acute inflammatory cells unless there is a secondary bacterial infection or choledocholithiasis
- Erosion of mucosa
- Edema
- Myofibroblasts, lymphocytes, plasma cells, eosinophils, and pigment-laden macrophages
- Fibrin
    - Thrombi in small veins
    - Sometimes fibrinoid necrosis

Gallbladder cancer

- Gallbladder cancer is an abnormal growth of cells that begins in the gallbladder Carcinoma arising from the gallbladder epithelium
- Gallbladder cancer is uncommon. When gallbladder cancer is discovered at its earliest stages, the chance for a cure is very good. But most gallbladder cancers are discovered at a late stage, when the prognosis is often very poor.
- Gallbladder cancer may not be discovered until it's advanced because it often causes no specific signs or symptoms. Also, the relatively hidden nature of the gallbladder makes it easier for gallbladder cancer to grow without being detected.



Types of gallbladder cancers

- Gallbladder cancers are rare and nearly all of them are adenocarcinomas. An adenocarcinoma is a cancer that starts in gland-like cells that line many surfaces of the body, including the inside the digestive system.
- Papillary adenocarcinoma or just papillary cancer is a rare type of gallbladder adenocarcinoma that deserves special mention.
- Other types of cancer can start in the gallbladder, such as adenosquamous carcinomas, squamous cell carcinomas, and carcinosarcomas, but these are very rare.

- **Symptoms**

- Abdominal pain, particularly in the upper right portion of the abdomen

- Abdominal bloating

- Losing weight without trying

- Yellowing of the skin and whites of the eyes (jaundice)

Causes

- A cell's DNA contains the instructions that tell a cell what to do. The changes tell the cells to grow out of control and to continue living when other cells would normally die. The accumulating cells form a tumor that can grow beyond the gallbladder and spread to other areas of the body.
- Most gallbladder cancer begins in the glandular cells that line the inner surface of the gallbladder. Gallbladder cancer that begins in this type of cell is called adenocarcinoma.

• Risk factors

- **sex.** Gallbladder cancer is more common in women.
- **age.** The risk of gallbladder cancer increases as the age.
- **A history of gallstones.** Gallbladder cancer is most common in people who have gallstones or have had gallstones in the past. Larger gallstones may carry a larger risk. Still, gallstones are very common and even in people with this condition, gallbladder cancer is very rare.
- **Other gallbladder diseases and conditions.** Other gallbladder conditions that can increase the risk of gallbladder cancer include polyps, chronic inflammation, and infection.
- **Inflammation of the bile ducts.** Primary sclerosing cholangitis, which causes inflammation of the ducts that drain bile from the gallbladder and liver, increases the risk of gallbladder cancer.

- **Pathophysiology**
- Longstanding cholelithiasis and cholecystitis give rise to metaplastic changes (intestinal or pseudo-pyloric types) in the gallbladder mucosa
- Metaplasia (especially intestinal type) gives rise to epithelial dysplasia and carcinoma in situ.
- Metaplasia: Transforms a cell from one form to another; caused by an external stimulus; can be reversible; less likely to lead to cancer.
- Dysplasia: Transforms a cell into an abnormal version of itself; caused by an internal stimulus; is not reversible; more likely to lead to cancer.
- Progression from dysplasia to advanced gallbladder carcinoma takes around 15 years