1. Exercise by Michael A. Riccioli-2006
****

Credits: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.

==

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 1)

Formation or presence of calculi (gallstones) in the gallbladder.

Most clinical **disorders** of the extrahepatic biliary tract **are** related to **gallstones**. In the USA, 20% of **persons** > age 65 have gallstones, and each year > 500,000 **undergo** cholecystectomy. Factors that **increase** the probability of gallstones include **female** sex, obesity, increased **age**, North American **Indian** ethnicity, a Western **diet**, and a positive **family** history.

2. Exercise by Michael A. Riccioli-2006
****

Credits: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.

==

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 2)

Formation or presence of calculi (gallstones) in the gallbladder.
Pathophysiology (Part 1)

Cholesterol, **the** major component **of** most gallstones, is highly insoluble **in** water, and biliary cholesterol is solubilized **in** bile salt-phospholipid micelles **and** phospholipid vesicles, which greatly increase **the** cholesterol-carrying capacity **of** bile. Bile salt micelles are aggregates **of** bile salts **in** which water-soluble (ionic) regions **of** the molecule face outward **into** aqueous solution, while the water-insoluble (nonpolar)

steroid nuclei face inward. Cholesterol is soluble **in**side these spheroid micelles, and their cholesterol-carrying ability is further enhanced **by** lecithin, a polar phospholipid. The amount of cholesterol carried **in** micelles and vesicles varies with **the** bile salt secretion rate.

3. Exercise by Michael A. Riccioli-2006
****
Credits: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.
===
(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 3)

Formation or presence of calculi (gallstones) in the gallbladder.
Pathophysiology (Part 2)

Supersaturation of cholesterol in bile is a **necessary** condition, but not a **sole** cause, of cholesterol gallstone **formation** because supersaturation is frequent in the bile of **fasting** persons without gallstones. The other critical **factor** in determining whether gallstones form is regulation of the **initiating** process, cholesterol monohydrate crystal formation. In gallbladder bile that is lithogenic (ie, prone to **stone** formation), there is supersaturation of cholesterol and relatively **rapid** nucleation of cholesterol crystals. The dynamic **interplay** of forces for and against cholesterol crystal nucleation and growth in the gallbladder includes the actions of **specific** proteins or apoproteins, gallbladder mucin, and gallbladder stasis.

Virtually all **gallstones** form within the gallbladder, but stones may form in the **bile** duct after cholecystectomy or behind strictures as a result of stasis.

4. Exercise by Michael A. Riccioli-2006
****
CREDITS: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.
===
N.B. Use the word given in capitals to form a word that fits in the space

(Chapter 48. Extrahepatic Biliary Disorders)

Cholelithiasis (Part 4)

Formation or presence of calculi (gallstones) in the gallbladder.

Symptoms and Signs (Part 1)

The clinical consequences of stone **formation** (FORM) in the gallbladder are exceedingly **variable** (VARY). Most patients remain asymptomatic for long periods, **frequently** (FREQUENT) for life. Stones may traverse the cystic duct with or without symptoms of **obstruction** (OBSTRUCT). Transient cystic duct obstruction results in colicky pain, whereas **persistent** (PERSIST) obstruction usually produces inflammation and acute cholecystitis. In contrast to other types of colic, biliary colic typically is constant, with pain progressively **rising** (RISE) to a plateau and falling gradually, lasting up to several hours. Nausea and **vomiting** (VOMIT) are often associated. Fever and chills are absent in uncomplicated gallbladder colic. Pain most often **occurs** (OCCUR) in the epigastrium or right upper quadrant, radiating to the right lower scapula.

5. Exercise by Michael A. Riccioli-2006
****
CREDITS: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.
==

N.B. Use the word given in capitals to form a word that fits in the space

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 5)
Formation or presence of calculi (gallstones) in the gallbladder.

Symptoms and Signs (Part 2)

Symptoms of dyspepsia and **fatty** (FAT) food intolerance are often **inaccurately** (INACCURATE) ascribed to gallbladder disease. **Belching** (BELCH), bloating, fullness, and nausea are **associated** (ASSOCIATE) about equally with cholelithiasis, peptic ulcer disease, or **functional** (FUNCTION) distress. Such symptoms may disappear after cholecystectomy but should not be the only indication for operation. Postprandial fatty food intolerance is likely to be **caused** (CAUSE) by cholelithiasis if

symptoms include right **upper** (UP) quadrant pain; however, the prevalence of postprandial functional distress is so high in the general population that symptoms alone are **insufficient** (SUFFICIENT) for diagnosis of gallbladder disease without **supportive** (SUPPORT) clinical signs and diagnostic studies.

6. Exercise by Michael A. Riccioli-2006
****

CREDITS: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.

===

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 5)
Formation or presence of calculi (gallstones) in the gallbladder.

Diagnosis

Few calculi escape detection, but **the** relative accuracy, ease, safety, and cost **of** diagnostic methods are subject **to** change, to debate, and to local availability **and** skills.

Real-time ultrasonography is **the** method of choice **for** diagnosing possible gallbladder calculi. Sensitivity (probability **of** a positive test when disease is present) is 98%; specificity (probability **of** a negative test when **the** disease is absent) is 95%. Static B mode ultrasonography **and** oral cholecystography are also sensitive **and** specific. Further information on **these** tests can be found **in** Ch. 37.

7. Exercise by Michael A. Riccioli-2006
****

CREDITS: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.

===

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 5)
Formation or presence of calculi (gallstones) in the gallbladder.

Treatment

Asymptomatic gallstones:

Because asymptomatic gallstones **are** often discovered **during** evaluation **of** other problems, the question arises whether **to** recommend observation **or** elective cholecystectomy. Neither choice applies **to** all circumstances. Although **the** natural history is unpredictable, **there** is a cumulative chance (about 2% **per** year) that symptoms will develop. Most patients with clinically silent stones decide that **the** discomfort, expense, and risk **of** elective surgery are not worth removing **an** organ that may never cause clinical illness, although **the** potential complications represent serious disease. If symptoms appear, prompt therapy **is** advisable.

8. Exercise by Michael A. Riccioli-2006
****
CREDITS: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.
==

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 5)
Formation or presence of calculi (gallstones) in the gallbladder.

Symptomatic gallstones (Part 1):

Biliary colic recurs with **irregular**, pain-free intervals of **days** or months. Symptoms often do not **progress** in severity or **frequency**, but neither do they cease. Symptomatic **patients** are at increased risk of **developing** complications, and cholecystectomy is indicated. Symptoms **attributable** to the gallbladder can be expected to **disappear** after cholecystectomy; nonspecific symptoms of postprandial dyspepsia **usually** also remit in patients who have **had** colic. Recurring **colic**, even years later, should **prompt** an evaluation for possible **common** duct stones (choledocholithiasis). Cholecystectomy does not **result** in nutritional **problems**, and no dietary **limitations** are required **postoperatively**.

9. Exercise by Michael A. Riccioli-2006
****
CREDITS: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.
==
COLLOCATIONS

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 5)

Formation or presence of calculi (gallstones) in the gallbladder.

Symptomatic gallstones (Part 2):

The **standard** operation for gallbladder **removal** through a right subcostal or midline **incision** is open cholecystectomy. When performed **electively** during a period free of **complications**, the procedure is relatively **safe**, with a mortality **rate** of 0.1 to 0.5%. However, since its introduction in 1988, laparoscopic **cholecystectomy** has been the treatment of choice for symptomatic **gallstones**. This technique was popularized largely because of a **shorter** convalescence, decreased postoperative discomfort, and improved **cosmetic** results. The procedure entails the insertion of specialized **surgical** instruments and a video **camera** into the peritoneal **cavity** through multiple small **incisions** in the abdominal **wall**. After insufflation of the peritoneal **cavity**, the gallbladder is removed under **video** monitoring. **Laparoscopic** cholecystectomy is converted to an open **procedure** in approximately 5% of cases, usually because of an inability to identify the **anatomy** of the gallbladder or to manage a **complication**.

10. Exercise by Michael A. Riccioli-2006
****

CREDITS: With thanks from The Merck Manual of Diagnosis and Therapy, Edition 17, edited by Mark H. Beers and Robert Berkow. Copyright 1999 by Merck & Co., Inc., Whitehouse Station, NJ.
===

COLLOCATIONS

(Chapter 48. Extrahepatic Biliary Disorders)
Cholelithiasis (Part 5)
Formation or presence of calculi (gallstones) in the gallbladder.

Symptomatic gallstones (Part 3):

For patients declining **surgical** treatment or for whom surgical **treatment** is inappropriate, gallbladder **calculi** may sometimes be dissolved in **vivo** by giving bile **acids** orally for many **months**. Stones must not be calcified, and demonstration of normal gallbladder **function** on oral **cholecystography** is essential. **Ursodeoxycholic** acid 10 mg/kg/day reduces biliary **secretion** of cholesterol and decreases the cholesterol **saturation** of bile, resulting in **gradual** dissolution of cholesterol-containing stones in 30 to 40% of patients. Recurrence of **stones** is common after cessation of the drug. **Alternative** methods of stone **dissolution** (methyl-tert-butyl ether) or stone **fragmentation** (extracorporeal shock **wave** lithotripsy) are now largely unavailable owing to greater patient **acceptance** of laparoscopic cholecystectomy.