



# Cholangitis/ Cholangiohepatitis Syndrome

## (Inflammation of the Bile Duct System and Liver)

### Basics

#### OVERVIEW

- The liver is the largest gland in the body; it has many functions, including production of bile (a fluid substance involved in digestion of fats); bile ducts begin within the liver itself as tiny channels to transport bile—the ducts join together to form larger bile ducts and finally enter the extrahepatic or common bile duct, which empties into the upper small intestine; the system of bile ducts is known as the “biliary tree”
- The gallbladder is the storage unit for bile; bile is stored until it is needed for fat digestion
- “Cholangitis” is inflammation of the bile duct or the biliary tree
- “Cholangiohepatitis” is inflammation of biliary structures and surrounding liver tissue
- Cholangitis/cholangiohepatitis syndrome occurs more commonly in cats; it is classified as “suppurative” or “nonsuppurative” (lymphoplasmacytic, lymphocytic), “granulomatous,” or “lymphoproliferative” (transition to lymphoma) based on microscopic examination of biopsy samples
- “Suppurative” refers to the presence of pus in the affected tissue; “nonsuppurative” refers to an inflammatory process that is not characterized by the presence of pus—in cholangitis/cholangiohepatitis syndrome, the inflammatory process is characterized by the presence of lymphocytes and plasma cells (so-called “lymphoplasmacytic” disease) or lymphocytes (so-called “lymphocytic” disease); lymphocytes are a type of white blood cell that are formed in lymphatic tissues throughout the body—lymphocytes are involved in the immune process; plasma cells are specialized white blood cells; plasma cells are lymphocytes that have been altered to produce immunoglobulin, an immune protein or antibody necessary for fighting disease
- “Granulomatous” refers to nodular, inflammatory lesions; “lymphoproliferative” refers to conditions in which an excessive number of lymphocytes are produced; “lymphoma” is a type of cancer that develops from lymphoid tissue, including lymphocytes, a type of white blood cell formed in lymphatic tissues throughout the body

#### SIGNALMENT/DESCRIPTION OF PET

##### Species

- Cats (common)
- Dogs (uncommon)

##### Breed Predispositions

- Cats—possibly Himalayan, Persian, and Siamese

##### Mean Age and Range

- Suppurative cholangitis/cholangiohepatitis syndrome—range, 0.4–16 years of age; mostly young to middle-aged cats
- Nonsuppurative cholangitis/cholangiohepatitis syndrome—range, 2–17 years of age; mostly middle-aged cats

##### Predominant Sex

- Suppurative cholangitis/cholangiohepatitis syndrome—male cats more likely to be affected than female cats

- Nonsuppurative cholangitis/cholangiohepatitis syndrome—none

## SIGNS/OBSERVED CHANGES IN THE PET

- Suppurative cholangitis/cholangiohepatitis syndrome—most severe clinical illness characterized by “acute abdomen” (sudden onset of severe abdominal pain), fever, often less than 5 days in duration; associated with blockage of the extrahepatic or common bile duct (known as “extrahepatic bile duct obstruction”)
- Suppurative cholangitis/cholangiohepatitis syndrome—sudden (acute) illness; fever; lack of appetite (known as “anorexia”); vomiting; painful abdomen; may have yellowish discoloration to the gums and other tissues of the body (known as “jaundice” or “icterus”); dehydration; collapse; generalized bacterial infection (known as “sepsis”); shock
- Nonsuppurative cholangitis/cholangiohepatitis syndrome—illness of greater than 3 weeks in duration (may have signs of illness for months to years); cyclic illness; long-term (chronic) vague signs: sluggishness (lethargy), vomiting, lack of appetite (anorexia), and weight loss; few physical abnormalities other than enlarged liver (known as “hepatomegaly”); thickened intestines with inflammatory bowel disease (IBD); variable yellowish discoloration to the gums and other tissues of the body (jaundice or icterus); rare fluid buildup in the abdomen (known as “abdominal effusion” or “ascites”)
- Decreased number of bile ducts (known as “ductopenia”) associated with nonsuppurative cholangitis/cholangiohepatitis syndrome in cats—increased appetite (known as “polyphagia”) due to reduced bile flow with poor digestion of fats and presence of large amounts of fat in the stool, due to the inability to digest the fat (known as “steatorrhea”) leading to decreased levels of fat-soluble substances (such as vitamin K<sub>1</sub>, essential fatty acids, vitamin E); unkempt coat, variable hair loss on the sides of the chest; variable pale or grayish coloration to the stools (known as “acholic feces”), due to the lack of bile pigments that cause the normal brown color of bowel movements

## CAUSES

### Suppurative Cholangitis/Cholangiohepatitis Syndrome

- Bacterial infection—most common in cats: *E. coli*, *Enterobacter*, *Enterococcus*,  $\beta$ -hemolytic *Streptococcus*, *Klebsiella*, *Actinomyces*, *Clostridia*, and *Bacteroides*; also rarely associated with toxoplasmosis; dogs: intestinal bacterial opportunists (bacteria that usually do not cause disease, but are able to cause disease because the pet's body and/or immune system has been weakened by some other disease process); rare cases with *Campylobacter*, *Salmonella*, and *Leptospira*
- Condition may be seen following blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) and diseases in which flow of bile is decreased or stopped (known as “cholestasis”)

### Nonsuppurative Cholangitis/Cholangiohepatitis Syndrome

- Co-existent disorders—inflammation of the gallbladder (known as “cholecystitis”); presence of hard, solid material in the bile duct or gallbladder (known as “cholelithiasis”); inflammation of the pancreas (known as “pancreatitis”); blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction); inflammatory bowel disease; long-term (chronic) inflammation of the tissue spaces in the kidneys (known as “chronic interstitial nephritis”) in cats

## RISK FACTORS

- Suppurative cholangitis/cholangiohepatitis syndrome—blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction); diseases in which flow of bile is decreased or stopped (cholestasis); infections elsewhere in the body
- Nonsuppurative cholangitis/cholangiohepatitis syndrome in cats—inflammatory bowel disease; inflammation of the pancreas (pancreatitis); blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction); possibly long-term (chronic) inflammation of the tissue spaces in the kidneys (chronic interstitial nephritis)

## Treatment

### HEALTH CARE

#### Inpatient Management

- Suppurative cholangitis/cholangiohepatitis syndrome with sudden (acute) illness characterized by fever, painful

abdomen, abnormal white blood cell count—hydration support; antibiotics; if the pet has blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) or inflammation of the gallbladder (cholecystitis): administer antibiotics *before* surgery; continue antibiotics for at least 4–8 weeks; treat with medications (such as ursodeoxycholic acid, SAME) to improve the secretion of bile until liver enzyme values normalize on bloodwork (serum biochemistry profile)

- Nonsuppurative cholangitis/cholangiohepatitis syndrome in cats with clinical signs of disease—fluid therapy, as necessary; diagnostic evaluations; liver biopsy (administer vitamin K1 *before* liver biopsy)
- Both forms of cholangitis/cholangiohepatitis syndrome in cats—may need blood transfusion following surgery or biopsy
- Supplement fluids with B vitamins, potassium chloride, and potassium phosphate, as needed; avoid dextrose supplements
- *Outpatient Management*
- Suppurative cholangitis/cholangiohepatitis syndrome—after sudden (acute) crisis has been managed
- Nonsuppurative cholangitis/cholangiohepatitis syndrome—after resolution of sudden (acute) crisis, provide lifelong treatment to alter the immune system (known as “immune-system modulation”) as well as antioxidant and liver-protective therapy

## ACTIVITY

- Restricted while the pet has clinical signs of disease

## DIET

- Nutritional support—to avoid hepatic lipidosis, feed a balanced high-protein, high-calorie feline diet; supplement water-soluble vitamins (such as vitamin B); “hepatic lipidosis” is a disease in which fats and lipids (compounds that contain fats or oils) accumulate in the liver as a possible complication of lack of appetite (anorexia)
- Antigen-restricted diet with co-existent inflammatory bowel disease
- Fat-restricted diet, if the pet has severe decrease in bile ducts (ductopenia), abnormal absorption of fat (known as “fat malabsorption”), or long-term (chronic) inflammation of the pancreas (pancreatitis) causing abnormal digestion of food (known as “maldigestion”)
- May require feeding tubes; rarely requires feeding through intravenous fluids (known as “parenteral nutrition”)

## SURGERY

- Surgical removal of the gallbladder (known as “cholecystectomy”)—if the pet has inflammation of the gallbladder (cholecystitis)
- Surgical procedure to produce a new connection between the biliary tree and the small intestines (known as “cholecystoenterostomy”)—may be needed in pets with blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction)
- Surgical removal of stones in the gallbladder (stones known as “choleliths”)

## Medications

- Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

## ANTIBIOTICS FOR SUPPURATIVE CHOLANGITIS/CHOLANGIOHEPATITIS SYNDROME

- Antibiotics that kill bacteria (known as “bactericidal antibiotics”)—against intestinal bacterial opportunists (bacteria that usually do not cause disease, but are able to cause disease because the pet's body and/or immune system has been weakened by some other disease process); amoxicillin-clavulanic acid (Clavamox) or enrofloxacin combined with metronidazole
- Resistant enterococci—vancomycin; “enterococci” are bacteria normally found in bowel movement of animals and people that occasionally cause disease
- Modify antibiotics, based on bacterial culture and sensitivity reports

## **MEDICATIONS TO ALTER THE IMMUNE RESPONSE (IMMUNOMODULATION) FOR NONSUPPURATIVE CHOLANGITIS/CHOLANGIOHEPATITIS SYNDROME**

- Steroids—prednisolone; long-term (chronic) therapy usually needed
- Metronidazole—in combination with prednisolone, especially if the pet has co-existent inflammatory bowel disease
- Cats with confirmed decreased number of bile ducts (ductopenia) require more aggressive treatment; clinical experience suggests combination of prednisolone, metronidazole with pulsed methotrexate (a chemotherapeutic drug); provide folate (folinic acid); may use chlorambucil instead of methotrexate
- Some cats require chemotherapy protocols developed for intestinal lymphoma (“lymphoma” is a type of cancer that develops from lymphoid tissue, including lymphocytes, a type of white blood cell formed in lymphatic tissues throughout the body)

## **ANTIOXIDANTS**

- Vitamin E (tocopherol)—higher dose if the pet has long-term (chronic) blockage of the extrahepatic or common bile duct (extrahepatic bile duct obstruction) or decrease in the number of bile ducts (ductopenia) because of abnormal absorption of fat (fat malabsorption)
- S-adenosylmethionine (SAME, Denosyl SD4)

## **OTHER**

- Ursodeoxycholic acid—has numerous potentially beneficial effects, including altering the immune response (immunomodulation), protecting the liver, causing secretion of bile, and providing antioxidant effects
- B-vitamin supplementation with thiamine (B1) and B12

## **Follow-Up Care**

### **PATIENT MONITORING**

- Nonsuppurative cholangitis/cholangiohepatitis syndrome—initially, monitor bloodwork (liver enzyme and bilirubin levels) every 7–14 days; with remission, assess bloodwork quarterly

### **PREVENTIONS AND AVOIDANCE**

- Control inflammatory bowel disease

### **POSSIBLE COMPLICATIONS**

- Suppurative cholangitis/cholangiohepatitis syndrome may transform into nonsuppurative cholangitis/cholangiohepatitis syndrome or sclerosing cholangitis/cholangiohepatitis syndrome (characterized by thickening or hardening of the biliary and/or liver tissues)
- Diabetes mellitus in 30% of cats with sclerosing cholangitis/cholangiohepatitis syndrome treated with prednisolone
- Hepatic lipidosis may develop with inadequate nutritional intake and in some cats, with steroid therapy; “hepatic lipidosis” is a disease in which fats and lipids (compounds that contain fats or oils) accumulate in the liver of cats

### **EXPECTED COURSE AND PROGNOSIS**

- Suppurative cholangitis/cholangiohepatitis syndrome—may be cured
- Nonsuppurative cholangitis/cholangiohepatitis syndrome—long-term (chronic) disease; long-term remission possible (remission greater than 8 years has been documented)

## **Key Points**

- “Cholangitis” is inflammation of the bile duct or the biliary tree
- “Cholangiohepatitis” is inflammation of biliary structures and surrounding liver tissue
- Cholangitis/cholangiohepatitis syndrome occurs primarily in cats; it is classified as “suppurative” or “nonsuppurative” (lymphoplasmacytic, lymphocytic), “granulomatous,” or “lymphoproliferative” based on microscopic examination of biopsy samples

- Suppurative cholangitis/cholangiohepatitis syndrome—sudden (acute) illness; fever; lack of appetite (anorexia); vomiting; painful abdomen; may have yellowish discoloration to the gums and other tissues of the body (jaundice or icterus); dehydration; collapse; shock
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- Long-term (chronic) nature of nonsuppurative cholangitis/cholangiohepatitis syndrome requires lifelong therapy

## Notes

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