Clinical NEWS 8th Edition

wepharm Animal Welfare

Liver disease in Cats and Dogs

A common condition in some animals

New

WePatiCare®

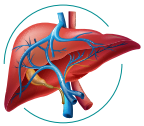
Global Support to **Liver Health and Function**

Liver disease is relatively common in dogs and cats and can be caused by a range of primary and secondary disorders. It is a differential diagnosis for many non – specific clinical signs (see below). In some cases, liver disease is suspected following results of blood tests indicating elevations in liver enzymes and/or bile acids. **It is important to consider the common differential diagnoses for liver disease as outlined below, and in particular to be aware of the possibility of secondary hepatic involvement with a more significant disease in another organ** (Warman, 2011).

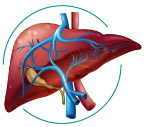
Dogs: Hepatitis; Drugs; Toxins; Infectious agents; Breed-associated disorders; Idiopathic; Nodular regeneration and cirrhosis; Congenital portovascular disorders; Neoplasia; Hepatic nodular hyperplasia; Secondary hepatic disease.

Cats: Suppurative (neutrophilic) cholangitis; Lymphocytic cholangitis; Feline infectious peritonitis (FIP); Hepatic lipidosis; Acute toxic hepatopathy; Congenital portosystemic shunt; Neoplasia; Secondary hepatic disease.

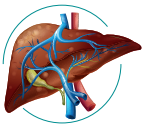
STAGES OF LIVER DISEASE



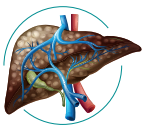
Healthy Liver



Fatty Liver



Fibrosis of Liver



Cirrhosis of Liver

Hepatic injury can be caused by various mechanisms, including damage, apoptosis, reactive intermediates, disruption of cell metabolism, cytoskeletal damage, and autoimmune responses. Direct damage to hepatocellular membranes can occur via mechanical injury, lipid peroxidation, or disruption/dysfunction of membrane proteins and transporters.

Free radicals generated within hepatocytes can cause damage to macromolecules, alter cell permeability, inactivate membrane-associated proteins, and interfere with normal cell metabolism, leading to cellular degeneration, necrosis, or apoptosis (Gwaltney-Brant, 2019).

The liver's response to injury depends on various factors and is limited in its types of responses. Hepatocellular degeneration is a common reversible response to nonlethal insult, but severe injury can lead to cell death. Cholestatic hepatic disease and steatosis are other responses to liver injury that can progress to chronic injury and neoplasia. Chronic liver injury with inflammation and/or cirrhosis may progress to hepatocellular carcinoma, which is associated with various causes (Gwaltney-Brant, 2019).

Gut dysbiosis plays a key role in liver fibrosis progression due to the close interaction between the gut microbiota and liver, with disrupted intestinal homeostasis and altered microbiota leading to hepatic inflammatory immune responses and hepatic stellate cells activation. Gut-liver axis disruption and dysbiosis of the gut microbiome may contribute to the progression of liver fibrosis.

Restoring the gut microbiome may be a potential therapeutic strategy for liver fibrosis. Liver function can improve with probiotic and prebiotics (Roehlen et al., 2020).

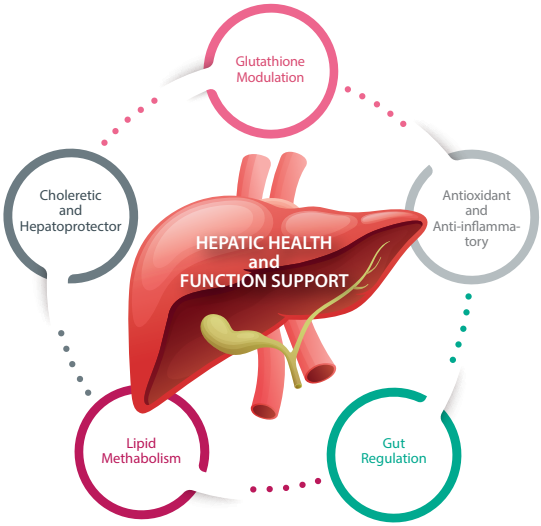
Glutathione is an essential antioxidant that is mainly stored in hepatocytes. Reduced hepatic concentrations of glutathione have been found in cats with extrahepatic bile duct obstruction, cats with hepatic lipidosis, and dogs and cats with necroinflammatory liver disease, supporting the importance of oxidative injury in a wide range of canine and feline hepatobiliary diseases (Ettinger et al., 2017). **Anti-oxidative therapy, mainly using natural and synthetic antioxidants, represents a reasonable therapeutic approach for the prevention and treatment of liver diseases due to the role of oxidative stress in contributing to initiation and progression of hepatic damage** (Li et al., 2015).

According to (Marchegiani et al., 2020), the most frequently used ingredients in canine and feline complementary feed to support liver function include: Milk thistle (*Silybum marianum*), Phosphatidylcholine, Artichoke (*Cynara scolymus*), *Curcuma* (Curcuma longa), Dandelion (*Taraxacum officinale*).

New non-pharmaceutical therapeutic strategies that target improving antioxidant capabilities, namely glutathione activity, gut-liver axis and microbiota balance, lipid metabolism and insulin resistance, as well as detoxification capacity, **may provide safer and more efficient methods**.

WePaticare® provides an extensive assortment of ingredients with an array of benefits for the global support of liver health and function. In summary, it improves the ability of the liver to fight oxidative stress by modulating several antioxidant agents, particularly glutathione, which is the most important antioxidant in the liver.

It also helps gut regulation, improving digestion and immunity; improves lipid metabolism, decreasing fat accumulation, lipid peroxidation and preventing cell damage; protects the liver from inflammation, fibrosis and increases its regenerative capacity; enhances detoxification capabilities and includes choleretic properties.



WePaticare® contains...

Curcuma
(Curcuma longa)

Milk thistle (SILIPHOS® - *Silybum marianum*)

Dandelion
(*Taraxacum officinale*)

BCAAs (Branch-chain amino acids)

Enterococcus faecium and Oat Bran

Zinc and Selenium

Artichoke
(Cynara scolymus)

Gingko biloba

Vitamin E

Vitamin B complex (B1, B2, B6, B9, B12)

Astragalus membranaceus

Lecithins (polyunsaturated phosphatidylcholines)

References:
1. 1.Sheena Warman (2011). Liver Disease. In: 100 Top Consultations in Small Animal General Practice, First Edition, Peter Hill, Sheena Warman and Geoff Shawcross (Eds.). Blackwell Publishing Ltd.; **2.** Gwaltney-Brant, S.M. (2019). Nutraceuticals in Hepatic and Pancreatic Diseases. In: Gupta, R., Srivastava, A., Lall, R. (eds) Nutraceuticals in Veterinary Medicine. Springer, Cham. https://doi.org/10.1007/978-3-030-04624-8_29; **3.** Roehlen, N., Crouchet, E., & Baumert, T. F. (2020). Liver Fibrosis: Mechanistic Concepts and Therapeutic Perspectives. Cells, 9(4), 875. https://doi.org/10.3390/cells9040875; **4.** Ettinger, S. J., Feldman, E. C., & Cote, E. (Eds.). (2017). Hepatobiliary Disease. In Textbook of Veterinary Internal Medicine (8th ed., Section XIX). St. Louis, Missouri, US: Elsevier; **5.** Li S, Tan HY, Wang N, Zhang ZJ, Lao L, Wong CW, Feng Y. The Role of Oxidative Stress and Antioxidants in Liver Diseases. Int J Mol Sci. 2015 Nov 2;16(11):26087-124. doi: 10.3390/ijms161125942. PMID: 26540040; PMCID: PMC4661801; **6.** Marchegiani A, Fruganti A, Gavazza A, Mangiaterra S, Candellone A, Fusi E, Rossi G, Cerquetella M. Evidences on Molecules Most Frequently Included in Canine and Feline Complementary Feed to Support Liver Function. Vet Med Int. 2020 May 9;2020:9185759. doi: 10.1155/2020/9185759. PMID: 32454964; PMCID: PMC7232710.