

# Pericardial Effusion

(Fluid Buildup between the Heart and the Sac Surrounding the Heart)

## Basics

### OVERVIEW

- Fluid buildup between the heart and the sac surrounding the heart (known as “pericardial effusion”)
- “Cardiac tamponade” is the clinical syndrome that results from decreased output of blood from the heart due to mechanical compression of the heart by the fluid buildup within the sac surrounding the heart (pericardial effusion)
- The sac surrounding the heart is the “pericardial sac” or “pericardium”
- “Effusion” is the medical term for the excess fluid that builds up within body cavities
- The heart of the dog or cat is composed of four chambers; the top two chambers are the right and left atria and the bottom two chambers are the right and left ventricles

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs
- Cats—uncommon (typically associated with congestive heart failure)

#### Breed Predilections

- Golden retrievers and German shepherd dogs are more likely than other breeds to have cancer of the right atrium (known as “right atrial hemangiosarcoma”) and to develop fluid buildup of unknown cause (so-called “idiopathic pericardial effusion”)
- Short-nosed, flat-faced (known as “brachycephalic”) breeds are more likely than other breeds to develop aortic body tumors (tumors that develop from specialized cells that detect changes in oxygen and carbon dioxide levels in the blood, the cells are located in the aorta [main artery of the body] at the base of the heart)

#### Mean Age and Range

- Middle-aged to older dogs for idiopathic pericardial effusion; hemangiosarcoma and heart-base tumors more common in elderly dogs

#### Predominant Sex

- Male dogs may be more likely than female dogs to develop fluid buildup of unknown cause (idiopathic pericardial effusion)

### SIGNS/OBSERVED CHANGES IN THE PET

- Long-term (chronic) fluid buildup between the heart and the sac surrounding the heart (pericardial effusion) often causes enlargement of the jugular vein (the jugular vein is the large vein in the neck; condition known as



“jugular distension”) and fluid buildup in the abdomen (known as “ascites”)

- Sluggishness (lethargy)
- Lack of appetite (known as “anorexia”)
- Weakness
- Exercise intolerance
- Abdominal enlargement or distension
- Breathing distress; occasionally, cough
- Fainting (known as “syncope”) or collapse
- Vomiting
- Muffled heart sounds
- Weak pulses
- Pale gums and moist tissues of the body (known as “mucous membranes”) or the pink color of the gums is slow to return when the gums are blanched by finger pressure (known as “poor capillary refill time”)
- Rapid breathing (known as “tachypnea”) and/or rapid heart rate (known as “tachycardia”)

## CAUSES

- Tumors or cancer (such as hemangiosarcoma), heart-base tumor, tumor or cancer of the thyroid gland (known as “thyroid adenoma” or “adenocarcinoma”), mesothelioma, and cancer that has spread (known as “metastatic cancer”), and lymphoma (especially in cats)
- Unknown cause (idiopathic pericardial effusion)—pericarditis (inflammation of the sac) with bloody effusion; due to fibrous thickening of the sac (condition known as “constrictive pericarditis”) with development of scar tissue
- Blood-clotting disorder (known as a “coagulopathy”)—poisoning with a vitamin K-antagonist rodenticide (such as warfarin); decreased number of platelets in the blood (known as “thrombocytopenia;” “platelets” and “thrombocytes” are names for the normal cell fragments that originate in the bone marrow and travel in the blood as it circulates through the body; platelets act to “plug” tears in the blood vessels and to stop bleeding); and other blood-clotting disorders
- Infection—feline infectious peritonitis (FIP); fungal infection (coccidioidomycosis); bacterial infection/inflammation of the sac surrounding the heart (known as “pericarditis”)
- Congenital (present at birth) disorders—pericardioperitoneal diaphragmatic hernia (condition in which defects exist in the lower part of the diaphragm [the muscular partition between the chest and abdomen] and the sac surrounding the heart [pericardial sac], allowing abdominal organs [such as the stomach, small intestines, liver] to move into the space between the heart and pericardial sac); intra-pericardial cysts
- Tear or trauma to the left atrium or heart
- Foreign body

## Treatment

### HEALTH CARE

- Fluid buildup between the heart and the sac surrounding the heart (pericardial effusion) with resulting compression of the heart (cardiac tamponade) warrants immediate tapping and draining of the space between the heart and the sac surrounding the heart (procedure known as “pericardiocentesis”)
- Repeated pericardiocenteses may be needed; surgery may be indicated in selected dogs
- Pericardiocentesis rarely is required in treatment of the cat
- Unless the pet has marked dehydration, administration of fluids generally is not required for treatment of long-term (chronic) pericardial effusion
- Administer oxygen to dogs with rapid breathing (tachypnea) or signs of circulatory instability

### ACTIVITY

- Cage rest initially, followed by exercise restriction

### SURGERY

- Surgical removal of part of the sac around the heart (sac is the “pericardium;” procedure is a “partial pericardectomy”) may be useful in the treatment of pericardial effusion accompanying heart-base tumors and

may prolong survival; may be palliative for right atrial tumors; may be done via scope (thoracoscopy) in some instances

- If fluid buildup is of unknown cause (idiopathic pericardial effusion)—may respond to tapping (pericardiocentesis); surgical removal of part of the sac around the heart (pericardectomy) is indicated for recurrent fluid buildup
- Some tumors may be treated surgically

## 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.

- Drugs will not be used in place of tapping and draining the space between the heart and the sac surrounding the heart (pericardiocentesis)
- Medications to remove excess fluid from the body (known as “diuretics”)—may help reduce fluid buildup in the abdomen (ascites), but may lead to side effects and pet weakness
- Vitamin K—indicated for patients with rodenticide-anticoagulant (such as warfarin) poisoning
- Antibiotics are indicated in pets with infection/inflammation of the sac around the heart (known as “infectious pericarditis”)
- Chemotherapy—may be useful to treat effusion caused by lymphoma; Partially effective in the treatment of other tumors (such as atrial hemangiosarcoma) and generally ineffective for heart-base tumor; doxorubicin-based chemotherapy following surgical removal of a tumor involving the right atrium has been shown to increase survival times, but dogs rarely survive more than 6 months following surgery
- Chemotherapy agents injected within the sac surrounding the heart (known as “intrapericardial administration”)—may be useful in dogs with fluid buildup of unknown cause (idiopathic pericardial effusion)
- Additional chemotherapeutic drugs may used to decrease the immune response; can be considered for recurrent idiopathic pericardial effusion after pericardectomy

## Follow-Up Care

### PATIENT MONITORING

- Electrocardiogram (ECG, a recording of the electrical activity of the heart)—advised during first 24 hours of tapping and draining the space between the heart and the sac surrounding the heart (pericardiocentesis), as the procedure often leads to irregular heartbeats (known as “arrhythmias”)
- Pericardial effusion may recur at any stage; follow-up examination and echocardiogram (use of ultrasound to evaluate the heart and major blood vessels) at 10–14 days and every 2–4 months recommended to detect recurrent idiopathic pericardial effusion

### POSSIBLE COMPLICATIONS

- Low blood pressure (known as “hypotension”) or shock
- Air in the space between the lungs and chest wall (known as “pneumothorax”), irregular heartbeats (arrhythmias), and tears or cuts into the heart muscle during pericardiocentesis
- Sudden death

### EXPECTED COURSE AND PROGNOSIS

- Right atrial hemangiosarcoma—poor; tumor is highly malignant, usually not able to remove it surgically at time of diagnosis, and it is minimally responsive to chemotherapy
- Chemodectoma—fair; slow-growing tumor, late to spread (metastasize); pericardectomy often resolves clinical signs; may respond to chemotherapy or radiation therapy; survival of up to 3 years has been reported following pericardectomy
- Prognosis is good with fluid buildup of unknown cause (idiopathic pericardial effusion); approximately 50% of cases resolve after one or two pericardiocenteses; surgical removal of part of the sac around the heart (pericardectomy) is often curative in persistent cases

## Key Points

- Fluid buildup between the heart and the sac surrounding the heart (pericardial effusion) with resulting compression of the heart (cardiac tamponade) warrants immediate tapping and draining of the space between the heart and the sac surrounding the heart (pericardiocentesis)
- Fluid buildup between the heart and the sac surrounding the heart (pericardial effusion) typically recurs; closely monitor for signs of recurrence and seek immediate veterinary medical attention
- Prognosis may vary greatly, depending on the underlying cause of the fluid buildup (pericardial effusion)
- Prognosis is good with fluid buildup of unknown cause (idiopathic pericardial effusion); approximately 50% of cases resolve after one or two procedures to tap and drain the space between the heart and the sac surrounding the heart; surgical removal of part of the sac around the heart (pericardectomy) is often curative in persistent cases