

**HEMANGIOSARCOMA**

<p>Description</p> <p><b>What Is Hemangiosarcoma in Dogs?</b> <i>PetMD from Chewy</i></p> <p><b>Hemangiosarcoma (HSA)</b> <i>National Canine Cancer Foundation</i></p>	<p><b>What Is Hemangiosarcoma in Dogs?</b> (<i>PetMD from Chewy</i>)</p> <p>Hemangiosarcoma is an aggressive form of cancer that develops from blood vessels.</p> <ul style="list-style-type: none"> <li>• It can occur anywhere in the body but most often affects a dog’s spleen, heart, liver, or skin.</li> <li>• Hemangiosarcoma tumors are composed of abnormal blood and blood vessels that are fragile, invasive, and easily ruptured.</li> <li>• When a tumor ruptures, it hemorrhages into a body cavity like the chest or abdomen, causing many of the clinical signs associated with hemangiosarcoma. (<i>PetMD from Chewy</i>)</li> </ul> <p><b>Hemangiosarcoma (HSA)</b> (<i>National Canine Cancer Foundation</i>)</p> <p>Hemangiosarcoma (HSA) also called malignant hemangioendothelioma or angiosarcoma is deadly cancer that originates in the endothelium and invades the blood vessels.</p> <ul style="list-style-type: none"> <li>• Hemangiosarcoma is more common in dogs than in any other species. It accounts for 5% of all non-cutaneous primary malignant neoplasms and 12% to 21% of all mesenchymal tumors in dogs.</li> </ul> <p>What are the three types of hemangiosarcomas?</p> <ul style="list-style-type: none"> <li>• <b>Dermal or Cutaneous</b> – Found on the skin</li> <li>• <b>Hypodermal or Sub-cutaneous</b> – Found under the skin</li> <li>• <b>Visceral or Organ</b> – Found on the spleen, pericardium, and the heart</li> <li>• Other frequent sites include the <b>right atrium, skin and sub-cutis, and liver.</b></li> <li>• Cases have also been reported in the <b>lungs, kidneys, oral cavity, muscle, bone, urinary bladder, left ventricle, uterus, and retroperitoneum.</b></li> <li>• Skin tumors consist of 2.3% to 3.6%.</li> <li>• <b>Splenic malignancies account for 45% to 51% and are therefore the most commonly diagnosed and the deadliest.</b> (<i>National Canine Cancer Foundation</i>)</li> </ul>
<p>Breeds at Risk</p> <p><i>PetMD by Chewy</i></p>	<p><b>Hemangiosarcoma</b> typically affects middle-aged to older dogs; but it has also been reported in puppies only a few months old. Some breeds may be predisposed to hemangiosarcoma, including: (<i>PetMD by Chewy</i>)</p> <ul style="list-style-type: none"> <li>• Boxers</li> <li>• German Shepherds</li> <li>• Golden Retrievers</li> <li>• Labrador Retrievers</li> <li>• Pit Bulls</li> </ul> <p><i>Dogs with thin hair coats:</i></p> <ul style="list-style-type: none"> <li>• Basset Hound</li> <li>• Beagle</li> <li>• Dalmatian</li> <li>• English Pointer</li> <li>• Greyhound</li> <li>• Italian Greyhound</li> <li>• Whippet (<i>PetMD by Chewy</i>)</li> </ul> <p>Other:</p> <ul style="list-style-type: none"> <li>• Bernese Mountain Dog</li> <li>• Flat Coated Retriever</li> <li>• Portuguese Water Dog</li> <li>• Skye Terrier</li> </ul>

<p>Causes and Genetics</p> <p><b>What are the causes of HSA?</b> <i>National Canine Cancer Foundation</i></p> <p><b>Are Some Dogs More Susceptible?</b> <i>AKC</i></p>	<p><b>What are the causes of HSA?</b> (<i>National Canine Cancer Foundation</i>)</p> <p>The etiology of this disease is not exactly known. However, its exclusive occurrence in dogs points to the heritable factors that contribute to the risk. Ultimately, the interactions of these risk factors with the environment probably lead to the mutations that give rise to the tumor.</p> <ul style="list-style-type: none"> <li>• Lesions arise when the cell gathers mutations that render the normal constraints of growth and genetic integrity of cells null and void.</li> <li>• Mutations take place because the enzymes that control cell division are not foolproof. Some cells in the body divide constantly to replace dead or damaged cells. Therefore, mutations are introduced into the body regularly.</li> <li>• Cutaneous hemangiosarcoma (found on the skin) is said to be the result of exposure to sunlight. (<i>National Canine Cancer Foundation</i>)</li> </ul> <p><b>Are Some Dogs More Susceptible?</b> (<i>AKC</i>)</p> <p>The cause of HSA is not yet known, but there may be a genetic component since it is more commonly diagnosed in certain breeds.</p> <ul style="list-style-type: none"> <li>• <b>Gene</b> studies from dogs with hemangiosarcoma are identifying mutations, with one study showing the <b>most significantly mutated gene to be tumor suppressor TP53</b>, which may appear in certain breeds.</li> <li>• According to <a href="#">Dr. Jaime Modiano</a> at the University of Minnesota College of Veterinary Medicine, breeds like <i>Golden Retrievers, Portuguese Water Dogs, Boxers, and German Shepherd Dogs</i> are considered to be at higher risk.</li> <li>• “Any dog of any breed, including mixed breeds, and of either sex, regardless of whether it is intact or neutered, can develop hemangiosarcoma,” says Dr. Modiano.</li> </ul> <p>Although HSA is much more common in <a href="#">senior dogs</a> aged between 8 and 12 years, <a href="#">Cornell’s Baker Institute</a> found dogs as young as 2 and as old as 15 were being diagnosed with HSA.</p> <ul style="list-style-type: none"> <li>• “Why dogs are particularly susceptible is unknown, but hemangiosarcoma of the internal organs is very rarely seen in livestock like horses, cows, and goats,” says Sams. On rare occasions, <a href="#">HSA can occur in cats</a>. (<i>AKC</i>)</li> </ul>
<p>Symptoms</p> <p><b>What are the symptoms?</b> <i>UF Health – Small Animal College</i></p>	<p><b>What are the symptoms?</b> (<i>UF Health – Small Animal College</i>)</p> <p>Clinical signs of HSA are often related to rupture and hemorrhage of the tumor including:</p> <ul style="list-style-type: none"> <li>• Weakness (it can be intermittent)</li> <li>• Abdominal distension</li> <li>• Pale mucous membranes</li> <li>• Collapse</li> </ul> <p>Dogs with tumors involving the right atrium of the heart may present with:</p> <ul style="list-style-type: none"> <li>• Arrhythmias</li> <li>• Muffled heart sounds</li> <li>• Signs of heart failure</li> </ul> <p>Some dogs may suffer sudden death due to a rupture of a mass in a critical location or severe and acute blood loss into a body cavity.</p> <ul style="list-style-type: none"> <li>• HSA may occur as cutaneous, subcutaneous or deep masses invading or originating from the muscle.             <ul style="list-style-type: none"> <li>○ These locations may cause lameness, a hard swelling within the muscle or edema of the affected region. (<i>UF Health – Small Animal College</i>)</li> </ul> </li> </ul>

Testing and Staging

**How Veterinarians Diagnose Hemangiosarcoma in Dogs**

*PetMD from Chewy*

**How Veterinarians Diagnose Hemangiosarcoma in Dogs** *(PetMD from Chewy)*

Veterinarians may suspect hemangiosarcoma based on clinical signs and history. Because hemangiosarcoma can affect any body system, testing and diagnosis is different based on individual cases.

- All forms of hemangiosarcoma involve **staging**, which is a determination of the severity and spread of the disease. Staging will decide available treatment options for pets and develop a general prognosis and expected survival time.
- Once a veterinarian suspects hemangiosarcoma, they will typically recommend bloodwork, chest x-rays, an abdominal ultrasound, and a cardiac echocardiogram.
- Advanced imaging, such as a CT scan or MRI, can help figure out the extent of disease spread.

**Splenic hemangiosarcoma**

- Veterinarians may diagnose a dog with splenic hemangiosarcoma after an acute collapse episode or weakness after a tumor ruptures. Often, splenic hemangiosarcoma is diagnosed after a veterinarian feels an enlarged spleen or incidentally discovers a mass on the spleen during an x-ray or ultrasound.
- For a definitive diagnosis, the spleen must be biopsied, and the samples must be evaluated by a pathologist.

**Cardiac hemangiosarcoma**

- Heart tumors are usually diagnosed by an ultrasound of the heart, known as an echocardiogram.
- Veterinarians may suspect a heart tumor after episodes of collapse and other evidence of poor heart function. These tumors may also be discovered incidentally on routine chest x-rays.
- A biopsy would also be required for a definitive diagnosis, but due to the location of the tumor around the heart, a biopsy is dangerous and typically not recommended.
- Most cardiac tumors are suspected to be hemangiosarcoma, but few are confirmed.
- Cardiac hemangiosarcoma is commonly discovered with other types of hemangiosarcoma, most notably of the spleen.
  - During the diagnostic workup process for splenic hemangiosarcoma, veterinarians typically closely evaluate the liver, lungs, and heart, which are all common places for hemangiosarcoma to spread.

**Cutaneous/subcutaneous hemangiosarcoma**

- Veterinarians typically start diagnosing skin tumors with a test called a fine needle aspirate (FNA). To perform an FNA, a veterinarian will use a needle to collect a small sample of tumor cells. These cells are then evaluated under a microscope.
- Some tumors easily shed cells during this process; however, most FNAs performed on hemangiosarcomas are only blood-filled and do not readily offer a diagnosis.
- A non-diagnostic FNA may raise a veterinarian's suspicion of cutaneous or subcutaneous hemangiosarcoma.
- A surgical biopsy is required for a definitive diagnosis. *(PetMD from Chewy)*

Treatment

**What is the treatment for Hemangiosarcoma?**

*National Canine Cancer Foundation*

**What is the treatment for Hemangiosarcoma?** *(National Canine Cancer Foundation)*

**Surgery** remains the primary method of treatment for all dogs with HSA. Cutaneous tumors are curable with surgery alone.

- But before the surgery appropriate treatment for shock-like crystalloids, colloids and severe coagulation anomalies should be addressed. The surgery here is quite aggressive because all the locally affected tissues have to be removed.
- For **splenic HSA** vets go for **splenectomy**. During the operation, the entire abdomen is thoroughly examined and all the lesions are sent for histopathology.
  - Dogs undergoing this surgery are susceptible to arrhythmia (irregular heartbeats). Thus, post-operation an ECG is needed to monitor the heartbeats of dogs.
  - This issue gets resolved in 24-48 hours.
- An open or **thoracoscopic pericardiectomy** is a palliative procedure that allows effusion to escape into the thorax instead of accumulating in the pericardium where a small volume can restrict function.

Other forms of treatment for Hemangiosarcoma include:

**Chemotherapy**

- Since a vast majority of the tumors are metastatic, chemotherapy is recommended after the surgery.
- The standard chemotherapy protocol for Hemangiosarcoma is single-agent and combination doxorubicin, (DOX) intravenously given every 3 weeks.
- Other combinations used are vincristine, cyclophosphamide and methotrexate, but these have not yielded satisfying results.
- In cases where surgery is impossible due to the location or the invasiveness of the disease, DOX-based chemotherapy is known to have reduced the gravity of the disease.

**Immunotherapy**

- Patients treated with immunotherapy using liposome-encapsulated muramyl tripeptide-phosphatidylethanolamine (L-MTP-PE) have shown marked improvement. The drug is not available in the US, but it has gained orphan status in the European Union and is being used in the treatment of pediatric osteosarcoma.

**Radiotherapy (RT)**

- It is not so often used due to the high metastatic rate of the disease and the involvement of anatomic sites. A combination of palliative RT with chemotherapy may prove beneficial, but it awaits further investigation. It may prove beneficial in cases like solitary dermal HSA or incomplete resection. *(National Canine Cancer Foundation)*

References	<p>AKC (American Kennel Club) Hemangiosarcoma in Dogs: What to Know By <a href="#">Harriet Meyers</a> Updated: Dec 12, 2023 <a href="https://www.akc.org/expert-advice/health/hemangiosarcoma-in-dogs/">https://www.akc.org/expert-advice/health/hemangiosarcoma-in-dogs/</a></p> <p>Canine Health Foundation - Canine Hemangiosarcoma - The Road from Despair to Hope Michelle G. Ritt, DVM, DACVIM; Tessa Breen, BSc (Hons), Dip GD, CMM 08/16/2007 <a href="https://www.akcchf.org/canine-health/your-dogs-health/canine-hemangiosarcoma.html">https://www.akcchf.org/canine-health/your-dogs-health/canine-hemangiosarcoma.html</a></p> <p>National Canine Cancer Foundation - Hemangiosarcoma (HSA) Or Angiosarcoma In Dogs <a href="https://wearethecure.org/learn-more-about-canine-cancer/canine-cancer-library/hemangiosarcoma/">https://wearethecure.org/learn-more-about-canine-cancer/canine-cancer-library/hemangiosarcoma/</a></p> <p>Pet MD from Chewy - Hemangiosarcoma in Dogs By <a href="#">Lauren Jones, VMD</a> Updated Sep. 23, 2022 <a href="https://www.petmd.com/dog/conditions/cancer/hemangiosarcoma-dogs">https://www.petmd.com/dog/conditions/cancer/hemangiosarcoma-dogs</a></p> <p>UF Health Small Animal College (College for Veterinary Medicine) - Hemangiosarcoma in Dogs <a href="https://smallanimal.vethospital.ufl.edu/clinical-services/oncology/types-of-cancer-and-treatment/hemangiosarcoma-in-dogs/">https://smallanimal.vethospital.ufl.edu/clinical-services/oncology/types-of-cancer-and-treatment/hemangiosarcoma-in-dogs/</a></p>
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Lost Temple Pets