

HEALTH CONDITIONS AND DISEASES COMMON TO GOLDEN RETRIEVERS



DISTEMPER — RAGofAZ ascertains whether or not a dog has been vaccinated against distemper and vaccinates when necessary.

The Disease

Canine distemper is a paramyxovirus, which appears very similar to the paramyxovirus causing human measles. Canine distemper virus in the dog can affect a widerange of organs including the skin, brain, eyes, intestinal and respiratory tracts. The virus is transmitted through the air through coughing by infected animals and also through body secretions such as urine. Dogs of any age can be affected; however, most are puppies less than 6 months of age.

Symptoms

Distemper virus can affect many systems of the body. The most common signs are nasal and eye discharge, coughing, diarrhea, vomiting, fever that may come and go, and seizures. Seizures from distemper are called “chewing gum” seizures as the dog appears to be exaggeratingly chewing gum. Mildly affected dogs may only cough and be misdiagnosed as having “kennel cough.” Others may develop pneumonia. Puppies that recover may have severe tooth enamel damage.

Diagnosis

There are several methods used to diagnose distemper in dogs and puppies. Depending upon the severity and time of infection, blood examined microscopically may show characteristic changes called “canine distemper inclusion bodies”. With some diagnostic tests, such as antibody tests, it is difficult, if not impossible, to distinguish between infection and the changes normally seen with canine distemper vaccination.

Treatment

There is no specific treatment for canine distemper. Therapy is largely supportive. Intravenous fluids are administered to prevent dehydration. Once seizures begin to occur, the virus has traveled to the brain, and the dog must be euthanized. (RAGofAZ was forced to euthanize 4 dogs, ranging in age from 1 to 5 in 2005. The dogs had come in from a puppy mill and had never been vaccinated. All four of them were experiencing back to back seizures.)

Prevention

Excellent vaccines have been developed to prevent canine distemper in dogs. The vaccines have been widely used for many years and have made significant strides in reducing the frequency of this disease. **RAGofAZ recommends that you keep your dogs vaccinated unless contraindicated by your veterinarian.**

RABIES — RAGofAZ ascertains whether or not a dog has been vaccinated against rabies and vaccinates when necessary.

The Disease

The transmission of the rabies almost always occurs as a result of an infected animal biting a non-infected animal. Skunks, raccoons, foxes, coyotes and bats are the animals most likely to transmit the virus. Rabies virus does not live very long outside the host and remains viable in the carcass of an infected animal for less than 24 hours. The rabies virus is shed at high levels in saliva. However, being bitten by a rabid animal does not necessarily mean that the bitten animal (or human) will become infected. It has been speculated, that only around 15% of exposed people will contract the disease. Humans, cats, and dogs are only mildly susceptible to the disease.

Symptoms

After coming in contact with the virus, the bitten animal may go through one or all of several stages. With most animals, the virus will spread through the nerves of the bitten animal towards the brain. The virus is relatively slow moving and the average time of incubation from exposure to brain involvement is between 3 to 8 weeks in dogs, 2 to 6 weeks in cats, and 3 to 6 weeks in people. However, incubation periods as long as 6 months in dogs and 12 months in people have been reported. After the virus reaches the brain it then will move to the salivary glands where it can be spread through a bite.

Diagnosis

The current way to diagnose rabies in animals is to submit the brain for microscopic examination at autopsy.

Treatment

There is no treatment. Once the disease develops in humans, death is almost certain. Only a handful of people have survived rabies after extremely intensive medical care. There have been several reported cases of dogs surviving the infection, but they are very rare.

Prevention

Vaccination is the best way to prevent infection and properly vaccinated animals stand very little chance of contracting the disease. While rabies vaccination for dogs is mandatory for all states, it is estimated that up to half of all dogs are not vaccinated. Check with your veterinarian to determine when the standard vaccination protocol is to vaccinate your dog. A year after a dog has had his initial rabies vaccination, a three-year rabies vaccination is recommended. The three-year vaccine has been tested and shown to be very effective. A few counties, states, or individual veterinarians require yearly or once every two-year vaccination for a variety of reasons that need to be explored more closely. **RAGofAZ recommends that dogs be vaccinated against rabies on a regular basis.**

VALLEY FEVER — RAGofAZ tests every exposed Golden for Valley Fever

The Disease

Valley Fever is a very real problem in the canine community in parts of Arizona. Years ago, cattlemen would drive their cattle up what is now Cave Creek Road, accounting for a great number of cases in this area. Valley Fever is caused by a fungus that lives in the desert soil. As part of its life cycle, the fungus grows in the soil and matures, drying into fragile strands of cells. The strands are very delicate, and when the soil is disturbed - by digging, walking, construction, high winds - the strands break apart into tiny individual spores. Dogs acquire Valley Fever by inhaling these fungal spores in the dust raised by the disturbance. The dog may inhale only a few spores or many hundreds. Once inhaled, the spores grow into spherules which continue to enlarge until they burst, releasing hundreds of endospores. Each endospore can grow into a new spherule, spreading the infection in the lungs until the dog's immune system surrounds and destroys it. The sickness Valley Fever occurs when the immune system does not kill the spherules and endospores quickly and they continue to spread in the lungs and sometimes throughout the animal's body. About 70% of dogs who inhale Valley Fever spores control the infection and do not become sick. These dogs are **asymptomatic**. The remainder develops disease, which can range from very mild to severe and occasionally fatal.

Symptoms

The most common early symptoms of primary pulmonary Valley Fever in dogs are coughing, fever, weight loss, lack of appetite and lack of energy. Some or all of these symptoms may be present as a result of infection in the lungs. As the infection progresses, dogs can develop a severe pneumonia that is visible on x-rays. Sometimes the coughing is caused by pressure of swollen lymph nodes near the heart pressing on the dog's windpipe and irritating it. These dogs sound like they have bronchitis. Additional symptoms develop when the infection spreads outside the lungs and causes systemic or **disseminated** disease. This form of Valley Fever is almost always more serious than when it is only in the lungs. Signs of disseminated Valley Fever can include lameness or swelling of limbs; back or neck pain; seizures and other manifestations of central nervous system swelling; soft swellings under the skin that resemble abscesses; swollen lymph nodes under the chin, in front of the shoulder blades, or behind the stifles; and non-healing skin ulcerations or draining tracts.

Contagion factors

Valley Fever is considered a **noncontagious** disease. Even if multiple animals or humans are affected in a household, each infection was acquired by inhaling spores from the soil. Coughing cannot spread it between animals or people. In the case of draining lesions, the form of the organism in the fluid is not considered to be infectious to people or animals. Nevertheless, such lesions are best handled by bandaging. Bandages should be changed daily or every other day and discarded in outside waste containers to minimize risk of contaminating the environment. For immuno-compromised persons living in a household with a pet that has a draining lesion, it is best to consult a physician regarding this issue.

Diagnosis

Diagnosis of Valley Fever requires suspicion of the disease from the dog's history, its symptoms, and the results of examinations and tests performed by a veterinarian. Common tests include blood tests and blood cell counts, chest x-rays, bone and joint x-rays, and a Valley Fever blood test.

Treatment

In most cases, a dog ill enough from Valley Fever to be seen by a veterinarian will require treatment with antifungal medication. Courses of medication are usually extensive, averaging 6-12 months. Dogs with disseminated disease in bones, skin, or internal organs usually require longer courses of medication. Oral antifungal medication in the form of daily pills or capsules is the usual treatment for Valley Fever. There are three common medications used to treat Valley Fever in dogs.

Ketoconazole (Nizoral) is the most commonly prescribed and the least expensive. **Incidence of side effects is relatively high** and the drug is usually administered twice daily with food. Absorption is an issue on an empty stomach and acidification usually improves uptake---check with your veterinarian about adding Vitamin C (ascorbic acid).

Itraconazole (Sporanox) is expensive with a **moderate incidence of side effects**. Administration is once to twice daily with food. Absorption is usually poor on an empty stomach. An oral liquid formulation with much better absorption is available and might be indicated for animals that are not eating very well but need this medication. However, expense may be an issue.

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******Fluconazole** (Diflucan) is expensive with a low incidence of side effects compared to the other two medications. It is administered once or twice daily. Absorption is excellent even on an empty stomach and this drug is often a good choice for very sick dogs that aren't eating well. Fluconazole is the drug of choice for dogs with infection of the brain, spinal cord, or eyes as it is the only drug that crosses into those tissues. Other treatments for Valley Fever are mainly directed at supportive care: making your dog feel better while the antifungal medication starts to heal the infection.

- Cough suppressants - the cough may be so severe that the veterinarian will prescribe medicine to relieve it.
- Pain and fever relief - anti-inflammatories or pain medication prescribed by a veterinarian may greatly help the dog's attitude and appetite during the severe stages of the disease.
- Nutritional support - while some dogs eat reasonably well with Valley Fever, others will shun food entirely. These patients may need measures taken to get nutrition into them. Offering human grade food such as chicken or hamburger is advised.
- Hospitalization - dogs that are too sick to eat and drink and are becoming dehydrated or are in severe respiratory distress may need 24-hour care, intravenous fluids, oxygen, or other medication that can only be given in the hospital environment.

Amphotericin B is an old but very effective antifungal medication that is mainly used for extremely sick dogs in today's veterinary practices. Amphotericin B is only available for intravenous administration and has the serious drawback of toxicity to the kidneys. Newer formulations of amphotericin B (lipid-complexed amphotericin B - brand names: Abelcet; Ambisome) with much lower kidney toxicity have recently become available. For dogs that are either very ill with Valley Fever or dogs that are not recovering on oral medication, intravenous treatment with amphotericin B, especially one of the newer lipid formulations, may be indicated. The cost is very high requiring 6 to 9 treatments over a 2 week period. Blood tests for kidney function must be run prior to each and every intravenous treatment.

Most ill dogs could receive a pet multivitamin supplement safely and possibly with benefit to overall well-being. Randall Thomason has completed a clinical trial on an immuno-supplement called Desert Defense which has been successful in boosting the immune systems of dogs with lower Valley fever titers. Some dogs in the clinical trials have benefited to the point of not requiring anti-fungal drugs at all. However, the veterinarian should be consulted before any course of treatment.

Prognosis

The good news is that most dogs, with adequate antifungal therapy, do recover from this disease, especially with early diagnosis and intervention. Dogs with infection only in the lungs have the best prognosis for recovery and usually respond the quickest to treatment. Dogs with disseminated infection almost always have a more guarded prognosis. As with lung infections, it seems that the majority responds well to medication and lead normal lives. A small proportion of animals must take medication for life, and another small number, unfortunately, die of Valley Fever in spite of drug treatment. For dogs that are seriously ill, requiring hospitalization and supportive therapy, the prognosis can be grave. With aggressive treatment, possibly including intravenous antifungal medication, some dogs will get well. Among those that respond to medication, about 80%, most will remain well with fluconazole (Diflucan), but treatment may be required for life. In animals with severe bone infections and the pain that goes with them, pain relief will often provide the support needed to allow the Valley Fever medication time to take effect. Treatment of high fevers with anti-inflammatories is helpful, also, as fever reduction can improve the appetite and energy level of the dog. Pain medicine and anti-inflammatories can be prescribed by a veterinarian. Some dogs do not recover in spite of everyone's best efforts, either due to the severity of illness at the time of diagnosis or because of long-standing, poorly responsive disease. Fortunately, these animals represent a minority of dogs with Valley Fever.

Prevention

Currently, there is no sure fire way to prevent Valley Fever in pets short of never residing in or traveling through the areas where the fungus grows. Valley Fever endemic areas are among the fastest growing regions in the country right now, which makes encounters of animals and people with the fungus a likely event. **Things one can do to reduce the likelihood of a dog's exposure to the fungus** are to avoid activities that generate dust, reduce digging behavior by dogs, prevent sniffing in rodent holes, and keep dogs indoors more than outdoors. Treating the soil is currently not practical as the fungus lives in spotty areas and can live up to 12 inches deep in the ground. Yard ground cover that reduces dust, however, is helpful: grass and deep gravel or other dust-controlling cover. A vaccine is under development. It is possible a vaccine will be available in the future to prevent Valley Fever or make it only a very mild illness in dogs. **RAGofAZ recommends testing all Goldens who live in the desert Southwest for Valley Fever.**

TICK FEVER

The Disease

Tick Fever, or Ehrlichiosis, is generally caused by an organism known as a rickettsia, **Ehrlichia canis**. In recent years, several other species of this parasite have also been identified. This organism is partly like bacteria, partly like a virus, and acts as a parasite of the body's blood cells and organs. The infection is transmitted from an infected dog to another by the bite of common ticks. Once a dog is infected with the organism, it may become quite sick 8-20 days later, or the dog may develop a slowly progressive chronic illness, which will not manifest clinical signs until **months or years** after initial infection.

Symptoms

The acute form causes fever, lethargy, and loss of appetite, and is usually mild and easy to treat. The chronic form can cause severe anemia, lethargy, loss of appetite, weakness, weight loss, organ dysfunction, organ failure, and sudden hemorrhage from the nose, bowels, or kidneys, all leading towards death. Other problems include eye diseases and neurological dysfunctions. Most cases of tick fever are diagnosed during this chronic phase of the disease.

Contagion

Tick fever is only transmitted by ticks and dogs with tick fever are not considered contagious.

Treatment

Treatment is usually very effective with most dogs showing good improvement shortly after treatment has begun. However, because of the severe and chronic nature of the disease, long term monitoring and even some repeating of treatments may be required to keep your dog healthy.

Prevention

When in an area where ticks are present, be certain to thoroughly check to dog's coat for ticks and remove them promptly. Ticks can fasten to any part of the dog's skin, but are commonly found around the ears, between the toes, and sometimes in the armpits. Always examine your dog after hiking in tick-infested areas. If you find only one or two ticks, the easiest thing to do is remove them. Keep in mind that the blood of ticks can be dangerous to people. Therefore, do not crush or squeeze a tick with your bare fingers. Before removing the tick, put on disposable rubber or plastic gloves. Ticks that are not attached to the skin are easily removed with a pair of tweezers. There are also special tick removing devices that are widely available. Once removed, the tick can be killed by putting it in rubbing alcohol. Ticks must attach for several hours before they can transmit diseases. If the dog has many ticks, treatment involves an insecticide dip containing natural or synthetic pyrethrins labeled for ticks, or an organophosphate dip such as Paramite. Be sure to eliminate all ticks from the dog's sleeping quarters. If you remove all ticks promptly after your dog has been running in the fields or woods, you can prevent many tick-borne infections. **RAGofAZ does test dogs that present with ticks for tick fever.**

HEARTWORM

The Disease

Adult heartworms in the heart lay very tiny larvae called microfilaria, which then live in the bloodstream. This microfilaria enters a mosquito when it sucks blood from an infected animal. In 2-3 weeks, the microfilaria develops into larger larvae in the mosquito and migrates to the mosquito's mouth. When the mosquito bites another animal, the larvae enter the animal's skin. The larvae grow and after about three months finish their migration to the heart, where they grow into adults, sometimes reaching a length of 14 inches. The time from when an animal was bitten by an infected mosquito until adult heartworms develop, mate, and lay microfilaria is about 6-7 months in dogs. In dogs, the adult worms can obstruct the various large blood vessels leading from the heart to the lungs. Worms may also enter smaller vessels in the lung and obstruct those vessels, as well. In severe cases, called "caval syndrome" worms start to fill the right ventricle of the heart.

Symptoms

Most dogs with heartworm infection do not show signs of disease. Some dogs may show decreased appetite, loss of weight, and listlessness. Often, the first sign of the disease is a cough. Animals with severe heartworm disease will start to show lack of endurance during exercise. Some will accumulate fluid in their abdomen that makes them look pot-bellied. In rare situations in which animals have many adult worms, the animals may die of sudden heart failure.

Diagnosis

Blood tests can determine the presence of heartworm.

Treatment

Treatment is hard on the dog's system and can be expensive.

Melarsomine, the medication currently used to treat heartworm infection, contains arsenic. It is given by injection deep in the muscles of the back instead of intravenously. The treatment protocol depends on the severity of infection. In less severe cases, the dog may be treated for four months with a heartworm preventive to kill any migrating heartworm larvae and to decrease the size of the female worms. Then an injection of melarsomine is given to kill the adult heartworms. Five weeks later, the dog is treated with two more injections of the adulticide. Four months after the treatment, the dog should be tested for heartworms using the antigen test. Some animals may need to undergo a second round of injections if repeat antigen tests remain positive. It is recommended that dogs remain on a monthly heartworm preventive during the treatment. In severe cases, it may be necessary to use the adulticide before the four months of heartworm preventive are given. Regardless of which drug is used, when the adult heartworms die, they can obstruct blood vessels to the lungs (these are called pulmonary embolisms). If only a small part of the lung is involved, there may be no clinical signs. However, if the vessels to a large portion of the lung or a small area of an already diseased lung are blocked, severe signs may result. These include fever, cough, coughing up blood, and even heart failure. **Because of the risk of these embolisms, any dog being treated with an adulticide must be kept very quiet during treatment and for at least 4 weeks thereafter.**

Prevention

Heartworm is almost totally preventable. A number of heartworm preventives for dogs are on the market. Some heartworm preventives, or drugs that are combined with them, will control other parasites. Preventive products should be used year-round, even in areas where mosquitoes only occur seasonally. Even if doses are accidentally skipped, preventive products are still beneficial to the pet. If given consistently over a 12-month period, it's possible to actually stop worms from developing into adults. Also, monthly heartworm preventives have activity against intestinal parasites, which inadvertently infect three to six million people every year. These preventives protect pets and people.

RAGofAZ recommends keeping the dog on heartworm preventive and having him/her tested once a year.

SKIN DISORDERS

ALLERGIES

Golden Retrievers can suffer from allergies more than most other breeds. Wheat is typically an offending factor and a lot of commercial dog foods have wheat in their recipes. It is not lethal to animals but it can cause them to have problems with their digestion or cause their skin to become inflamed and irritated. If the dog licks its face excessively or scratches constantly, you might have a dog that is allergic. The Golden can also develop lick granulomas or hot spots.

Treatment

Change dog food to a grain-free formula, for example: Natural Balance, Solid Gold, Nutrisource, etc. If the allergies are environmental or more severe, the Golden may need additional treatment such as short-term steroid protocol (monitored with bi-annual blood tests to check liver function) or Atopica. Supplementing with Omega fatty acids, such as fish oil capsules, should help promote better skin health. Mild environmental allergies may be helped by over the counter antihistamines, such as Benadryl. Bathing should be done often and with a hypoallergenic shampoo.

Lipomas

These are fatty tumors located just under the skin. They can be surgically removed (while the dog is having his teeth cleaned is a good time so as to avoid unnecessary anesthesia) but unless they are growing in an area that restricts movement, they can be left alone.

Treatment

It is recommended that they be aspirated to make certain that they are indeed lipomas and not liposarcomas which are malignant and should be removed.

Hot spots

These are actually skin infections known by vets as pyotraumatic dermatitis. They are typically open wounds made worse by the dog licking and scratching. They result from allergies, ear infections, grooming issues and are caused by bacteria.

Treatment

Trim the hair around the sore to prevent further spread of the infection and expose the edges of the lesion; wash the area in a mild water-based astringent or antiseptic; be prepared to use antibiotics or cortisone if the washing does not give results.

EAR INFECTIONS

Simple Ear infections

Infections may be caused by a number of different types of yeast and bacteria. Ear infections occur when bacteria and yeast on the skin work their way into a weakened ear canal. The canal may have become weakened and lose some of its ability to fight infection because it became wet (from bathing, or from a swim), because the dog has allergies, because the dog has skin disease, or because the ear canal has become injured from a scratch, insect bite or from various other causes. Any of these factors will weaken the ear's normally strong defense mechanisms and allow an infection to get started. The symptoms that are noticed with these types of infections vary considerably. A mild ear infection might be implied by an ear that constantly fills with wax, no matter how often it is cleaned. As the disease progresses from mild, to moderate, to severe, pain begins and gradually gets more intense. The dog may shake his head frequently, stand with his head at a tilted angle, or cry when he scratches his ear. In some cases blood and pus may be shaken out of the ear or a disagreeable odor might be noticed.

Treatment

If the ear canal is full of debris, this may be impossible without a thorough cleansing of the canal. If the dog's ear infection is bacterial a sample may be taken at this time and allowed to grow in different antibiotic solutions to determine which antibiotic will be best to use to achieve a cure. The ear canal will be thoroughly cleaned until there are no discharges left to prevent the medications from reaching the infected lining of the canal. Further treatment will take place at home and care must be taken to do this adequately. If not, the infection will not go away and the dog will continue to suffer. A solution will be prescribed that will need to be massaged into the ear canals and perhaps swabbed out. At first it may be difficult to clean the dog's painful ear. As the infection gets under control and the ear feels better the Golden won't be as resistant to attempts at treatment. Bacterial infections are also treated with oral antibiotics and occasionally other oral medications. Following the directions on the medicines will give them the best chance to work and clear up the infection.

Complications from ear infections

Very few ear infections get better without medical assistance. Left untreated the infection might cause the eardrum to rupture causing a middle ear infection and loss of balance for the Golden. This condition is very hard to cure and will probably result in loss of hearing. Continual shaking of the head may cause a blood blister to develop in the ear flap which will need to be surgically corrected. Rarely the infection might travel up the acoustic nerve and cause a fatal brain infection. Even if none of these complications take place, an untreated ear infection continually causes pain for the dog.

Treatment

Surgery which may or may not restore hearing.

INTESTINAL PARASITES

Hookworm

These worms are most commonly seen in young dogs. Adult worms live in the small intestine. The eggs pass out of the body in the stool. Animals become infected with hookworms by eating infective eggs or larvae; penetration of footpads or skin by larvae; transmission through the milk while nursing; or, transmission from the mother into the fetus while still pregnant. It takes three weeks from the time of infection until eggs are passed into the stool. Hookworm infection can cause a severe and sometimes

fatal anemia in the young, weak, or malnourished animals. Clinical signs are weight loss, diarrhea, and bloody, tarry stools. Sometimes the worms are seen in the feces. Treatment consists of oral deworming medication and correction of any anemia. A follow up treatment is given 3 weeks later. The worms look like long strings of spaghetti and usually will come out in the feces once the dewormer is administered. All fecal material needs to be picked up and disposed of for the next 5-7 days during treatment. Any other pets exposed to hookworms should also be treated. Several heartworm preventives contain added medication to help prevent re-infection with hookworms. **Caution**—The hookworm larvae can penetrate human skin and potentially cause a skin problem called ‘cutaneous larval migrans’ or ‘creeping eruption.’ No one should be barefoot for 5-7 days while the pet is being treated for hookworms.

Roundworms

These worms are also commonly seen in young dogs. The adults live in the small intestine and the eggs are passed in the stool. Animals are infected by ingestion of other infected animals or by pre-natal infection. Eggs are passed in the stool 3 weeks after infection. Infection with roundworms can cause poor hair coat, diarrhea, pot-bellied appearance, and sometimes secondary bacterial pneumonia. Worms can sometimes be vomited up or seen in the feces. Treatment is with an oral de-worming medication with a follow up dosage in 3 weeks. All fecal material needs to be picked up and disposed of for the next 5-7 days. Again, the worms will be seen in the stool and they look like spaghetti. Most heartworm preventives contain medication to help prevent re-infection with the worms. **Caution**— Roundworm larvae can penetrate human skin. The migrating larvae can affect various organs in the body—causing mechanical damage and also granulomas to form. This disease is called ‘Visceral larval migrans.’ No one should be barefoot for 5-7 days following treatment.

Tapeworm

The adult cestodes live in the intestine of dogs and cats. The parasite is obtained by eating an infected flea. It can be transmitted by eating infected small mammals. Diagnosis is by visualization of the small, ‘rice-like’ worms in the stool (most common method); or seeing the eggs on a fecal flotation exam. The eggs and worm segments are inconsistently shed in the feces. A negative fecal flotation exam does not completely rule out the possibility of tapeworm infection. Clinical signs are rare since tapeworm infection rarely causes a problem. Some clinical signs can be shaggy coat, irritability, diarrhea, or lethargy. Treatment is via oral de-worming medication or an injection. Control can be achieved by preventing exposure to fleas. Tapeworm is not contagious.

Giardia

Giardiasis is a common protozoan of all animals. It lives in the small intestine. Infection is via the fecal-oral route. The incubation period is 1-2 weeks. Clinical signs can be not readily apparent, or persistent with diarrhea and weight loss. Several examinations are sometimes needed to identify the organism. Treatment is with oral medication to all exposed pets. **Caution**--People can become infected with these protozoa by fecal-oral transmission, which includes drinking untreated water (rivers and streams).

Prevention of Intestinal Parasites

A fecal exam should be done on the Golden every 6 to 12 months. Use over the counter de-wormers as necessary when worms are detected. Exercise your dog in grassy areas not frequented by other dogs. Remove feces from your lawn and yard daily. Prevent your dogs from eating rodents or earthworms and control fleas.

BLOAT

Bloat is an extremely serious condition and should be considered to be life-threatening. There are no home remedies for bloat and a veterinarian should be contacted immediately.

Symptoms

The most obvious signs are abdominal distention (swollen belly) and nonproductive vomiting (animal appears to be vomiting, but nothing comes up) and retching. Other signs include restlessness, abdominal pain, and rapid shallow breathing. Profuse salivation may indicate severe pain. If the dog's condition continues to deteriorate, especially if bloat has occurred, the dog may go into shock and become pale, have a weak pulse, a rapid heart rate, and eventually collapse.

Contributing factors

Dogs over 7 years of age are more than twice as likely to develop bloat as those who are 2-4 years of age. Male dogs are twice as likely to develop bloat as females. Neutering does not appear to have an effect on the risk of bloat. Dogs fed once a day are twice as likely to develop bloat as those fed twice a day. It appears that dogs that eat rapidly or exercise soon after a meal may also be at increased risk. Dogs that tend to be more nervous, anxious, or fearful appear to be at an increased risk of developing bloat.

Treatment

When the dog is presented to the hospital his condition is assessed. Blood samples are generally taken and tested to help determine the dog's status. Usually the animal is in shock, or predisposed to it, so intravenous catheters are placed and fluids are administered. Antibiotics and pain relievers may be given. The air in the stomach is removed either by passing a stomach tube or inserting a large needle into the stomach and releasing the gas. After the animal is stabilized, x-rays are taken to help determine the dog's condition. Some dogs with bloat develop a bleeding disorder called disseminated intravascular coagulation, in which small clots start to develop within the dog's blood vessels. To prevent or treat this condition, heparin, an anticoagulant, may be given. The heart rate and rhythm are closely monitored. Some dogs with bloat develop heart arrhythmias, and this is a common cause of death in dogs with bloat. Dogs that already have a heart disease or are prone to heart arrhythmias are generally treated with appropriate medications. Once the dog is stabilized, abdominal surgery is usually indicated to accomplish three things:

- Assess the health of the stomach and surrounding organs. If areas of the stomach or spleen have been irreversibly damaged, they are removed. In such a case, the chances for recovery are very poor, and euthanasia may be an alternative.
- Properly reposition the stomach
- Suture the stomach in a way to prevent it from twisting again (a procedure called gastropexy). If gastropexy is not performed, 75-80% of dogs will develop bloat again.

After surgery, the dog is closely monitored for several days for signs of infection, heart abnormalities, DIC, stomach ulceration or perforation, and damage to the pancreas or liver. Antibiotics and additional medications may need to be given.

Prevention

Owners of susceptible breeds should be aware of the early signs of bloat and contact their veterinarian as soon as possible if bloat is suspected. Owners of Golden Retrievers should develop a good working relationship with a local veterinarian in case emergency care is needed. **Large dogs should be fed two or three times daily, rather than once a day.** Water should be available at all times, but should be limited immediately after feeding. Vigorous exercise, excitement, and stress should be avoided one hour before and two hours after meals. Diet changes should be made gradually over a period of three to five days. Susceptible dogs should be fed individually and, if possible in a quiet location. **Feed in elevated feeding standing for better digestion.** Some studies have associated food particle size, fat content, moistening of foods containing citric acid, and other factors with bloat. At this time, no cause-and-result relationships between these factors and bloat have been verified. Dogs that have survived bloat are at an increased risk for future episodes; therefore prophylaxis in the form of preventive surgery or medical management should be discussed with the veterinarian.

ENDOCRINE DISEASES

Cushing's disease

Cushing's disease is probably more accurately referred to as hyperadrenocorticism -- the production of too much adrenal hormone, in particular corticosteroids. It can be naturally occurring or due to over administration of corticosteroids such as prednisone (iatrogenic Cushing's). The latter is easy to cure - just cut out the corticosteroid administration slowly to allow the body to return to normal function. The former is more difficult. Hyperadrenocorticism occurs for two reasons --- a tumor of the adrenal gland that produces adrenal hormones or stimulation of the normal adrenal glands from the hormones that control it. The primary reason for this to occur is a pituitary gland tumor that produces excessive ACTH, which stimulates the adrenal gland to produce corticosteroids. Adrenal gland tumors account for 15% of the cases of spontaneous hyperadrenocorticism. Pituitary tumors account for 85%.

Cushing's disease causes increased drinking, increased urination, increased appetite, panting, high blood pressure, hair loss - usually evenly distributed on both sides of the body, pendulous abdomen, thinning of the skin, calcified lumps in the skin, susceptibility to skin infections and diabetes, weakening of the heart and skeletal muscles, nervous system disease and other symptoms.

Treatment

If it can be determined that there is an adrenal gland tumor, it can be removed. Many veterinarians prefer to have a specialist attempt this since the surgical risks can be high. Pituitary gland tumors are not usually removed in veterinary medicine. This situation is treated using Lysodren or Ketoconazole. Lysodren selectively kills the outer layer of the adrenal gland that produces corticosteroids. By administering it in proper amounts it is possible to kill just enough of the gland off to keep the production of corticosteroids to normal levels. Close regulation of this using blood testing is necessary. Proper treatment will not necessarily result in a cure but will definitely improve the dog's quality of life.

Diabetes

There are two types of diabetes: diabetes insipidus and diabetes mellitus. Diabetes is an endocrine disease that is brought about by the malfunction of the endocrine glands. Diabetes in dogs is a hereditary disease. It is also considered as an autoimmune disease that may lead to further system malfunctions. Early diagnosis is very crucial so that the dog's disease can be reversed. To determine if the dog has diabetes, a sugar blood test is required.

Treatment

The management of dog diabetes starts with a proper diet. There are foods that the dog should eat in order to help this condition and there are certain foods that can possibly make the dog's diabetes become worse. When the Golden is suffering from diabetes, regular visits to the vet are essential. Prepared meals may be required instead of giving the dog its regular food. Certain medications may be required for dogs suffering from the worst cases of this disease. Insulin injections are very important because they can extend the life of the dog and allow it to live normally despite having diabetes.

Hypothyroidism

Hypothyroidism most commonly develops in middle-aged dogs between the ages of 4 to 10 years. Hypothyroidism is the condition that occurs when not enough thyroid hormones are produced. Hypothyroidism causes a wide variety of symptoms, but is often suspected in dogs that have trouble with weight gain or obesity and suffer from hair loss and skin problems. Hypothyroidism is easy to diagnose with a blood test that checks the level of various thyroid hormones including T3 and T4. Most hypothyroid dogs respond readily to treatment with synthetic thyroid medication.

Treatment

Hypothyroidism in dogs is easily treated. Treatment consists of placing the dog on a daily dose of a synthetic thyroid hormone called thyroxine (levothyroxine). There are numerous brand names of this drug. The dose and frequency of administration of this drug varies depending on the severity of the disease and the individual response of the animal to the drug. A dog is usually placed on a standard dose for his weight and then blood samples are drawn periodically to check his response and then the dose is adjusted accordingly. Once therapy is started, the dog will need to be on treatment for the rest of his life. Usually after the treatment is started, the majority of the symptoms resolve.

Addison's disease

Addison's is also known as hypoadrenocorticism, or adrenal insufficiency. There are three forms of Addison's disease: primary, secondary and atypical. Primary and atypical Addison's are usually the result of immune mediated damage to the glands. Secondary hypoadrenocorticism is from failure of the pituitary to stimulate the adrenals with adrenocorticotropic hormone (ACTH). The symptoms of Addison's disease can be vague. More importantly, they are similar to the symptoms of many different problems. Initially, the dog may be listless, or seem depressed. Many dogs are described as just seeming off, or losing the normal sparkle in their eye. Lack of appetite is a good indicator. Other symptoms include gastrointestinal problems like vomiting and diarrhea. Pain in the hind quarters, or generalized muscle weakness such as a dog that can't jump onto a bed or couch as he has done in the past is not uncommon. Shivering or muscle tremors may also be present. The veterinarian might make a diagnosis by testing the dog's electrolyte levels. For definitive diagnosis the dog is given an ACTH stimulation or response test. This tests the ability of the adrenal glands to produce the corticosteroid hormone cortisol.

Treatment

There are several medications used to treat Addison's. The first type acts as a mineralocorticoid and replaces the aldosterone – the hormone responsible for maintaining electrolyte levels. It is replaced with either an oral medication called Florinef™ (fludrocortisone acetate) or the injectable Percorten-V™ (desoxycorticosterone pivalate or DOCP). For dogs that have atypical or secondary Addison's neither of these medications are used because the production of aldosterone isn't effected and electrolytes remain in balance. In addition to replacing the aldosterone, the cortisol, or glucocorticoids, normally secreted by the adrenals must also be replaced. This is typically done with

an oral form of prednisone or hydrocortisone. With atypical and secondary Addison's the glucocorticoid is the only medication given. While your dog with Addison's disease will need medications and monitoring for the rest of his life, most dogs with Addison's can return to their favorite activities.

ORTHOPEDIC CONDITIONS

Hip Dysplasia

Hip dysplasia is associated with abnormal joint structure and a laxity of the muscles, connective tissue, and ligaments that would normally support the joint. As joint laxity develops, the articular surfaces of the two bones lose contact with each other. This separation of the two bones within the joint is called a subluxation, and this causes a drastic change in the size and shape of the surfaces. Most dysplastic dogs are born with normal hips but due to their genetic make-up (and possibly other factors) the soft tissues that surround the joint develop abnormally causing the subluxation. It is this subluxation and the remodeling of the hip that leads to the symptoms we associate with this disease. Hip dysplasia may or may not be bilateral; affecting both the right and/or left hips.

Symptoms

Dogs of all ages are subject to hip dysplasia and the resultant osteoarthritis. In severe cases, puppies as young as five months will begin to show pain and discomfort during and after exercise. The condition will worsen until even normal daily activities are painful. Without intervention, these dogs may eventually be unable to walk. In most cases, however, the symptoms do not begin to show until the middle or later years in the dog's life. The symptoms are similar to those seen with other causes of arthritis in the hip. Dogs often walk or run with an altered gait. They may resist movements that require full extension or flexion of the rear legs. Many times, they run with a 'bunny hopping' gait. They will show stiffness and pain in the rear legs after exercise or first thing in the morning. They may also have difficulty climbing stairs. In milder cases, dogs will warm-up out of the stiffness with movement and exercise. Some dogs will limp and many will become less willing to participate in normal daily activities. Many owners attribute the changes to normal aging but after treatment is initiated, they are surprised to see a more normal and pain-free gait return. As the condition progresses, most dogs will lose muscle tone and may even need assistance in getting up.

Causes

Many cases of hip dysplasia are genetic. Genetic screening for hip dysplasia in the parents is helpful, but even in the best of circumstances; there is still a 1 in 4 chance of the Golden puppy developing hip dysplasia. It has been shown that obesity can increase the severity of the disease in genetically susceptible animals. It stands to reason that carrying around extra weight will exacerbate the degeneration of the joints in a dog, including the hip. Dogs that may have been born genetically prone to hip dysplasia and are overweight are therefore at a much higher risk of developing hip dysplasia and eventually osteoarthritis. Rapid growth in puppies is another contributing factor. Especially from the ages of 3 to 10 months, puppies should not be free-fed. Exercise may be another risk factor. It appears that dogs that are genetically susceptible to the disease may have an increased incidence of disease if they over-exercised at a young age. However, low impact exercise and maintaining good muscle mass may actually decrease the incidence of the disease. Moderate exercise that strengthens the gluteal muscles, such as running and swimming, is probably a good idea. Whereas, activities that apply a lot of force to the joint are contraindicated. An example would be jumping activities such as playing Frisbee.

Diagnosis

Diagnosis is made by hip x-ray. The dog will need to be sedated for the proper manipulation of the hips and legs to be performed.

Surgical Treatment

Triple Pelvic Osteotomy (TPO): TPO is a procedure used in young dogs usually less than 10 months of age that have radiographs that show severe hip laxity, but have not developed damage to the joints. The procedure involves surgically breaking the pelvic bones and realigning the femoral head and acetabulum restoring the weight-bearing surface area and correcting femoral head subluxation. This is a major surgery and is expensive, but the surgery has been very successful on animals that meet the requirements. **Femoral Head Osteotomy (FHO):** Femoral head and neck excision is a procedure in which the head of the femur is surgically removed and a fibrous pseudo-joint replaces the hip. A “false joint” forms, consisting of fibrous scar tissue around the bone end. This forms in the muscles over the hip, which fortunately is strong enough to provide some stability. It is less painful than leaving the dislocated femoral head rubbing against the pelvic bone. **Total Hip Replacement (THR):** This may be the best surgical option for dogs that have degenerative joint disease as a result of chronic hip dysplasia. Total hip replacement is a procedure that can produce a functionally normal joint, eliminate degenerative changes, and alleviate joint pain. The procedure involves the removal of the existing joint and replacing it with an artificial joint or prosthesis. To be a candidate for this procedure, the animal must be skeletally mature. With the new micro-prosthetics there is no minimum size limit. In addition, there is no maximum size limit. If both hips need to be replaced, there is a three-month period of rest recommended between the surgeries. As with the TPO surgery, this is an expensive procedure but it produces very good results. Most dogs return to a near normal level of activity without pain.

Medical Treatment

Medical management of hip dysplasia and osteoarthritis has greatly improved thanks to the introduction and approval of several new drugs. Because hip dysplasia is primarily an inherited condition, there are no products on the market that prevent its development. Through proper diet, exercise, supplements, anti-inflammatories, and pain relief, you may be able to decrease the progression of degenerative joint disease, but the looseness in the joint or bony changes will not change significantly. Because of the high cost involved with corrective surgeries, medical management is many times the only realistic option for pet owners. Medical management is multifaceted. For the best results, several of the following steps should be taken:

- **Weight Management:** Helping a dog maintain his recommended weight may be the single most important thing owners can do for their pets. Surgical procedures and medical therapies will be far more successful if the animal is not overweight. You, as the owner, have control over what your dog eats. If you feed a quality food in an amount appropriate for your dog’s size, breed and activity level and keep treats to a minimum; your dog should be able to maintain an ideal weight. If your dog is overweight, seek the advice of your veterinarian concerning a lower calorie dog food and an exercise program.
- **Exercise** is equally important in losing and/or maintaining the appropriate weight. Exercise that provides good range of motion and muscle building as well as limiting wear and tear on the joints is best. Leash walks, swimming, walking on treadmills, and slow jogging are excellent low-impact exercises. Bear in mind that an exercise program needs to be individualized for each dog based on the severity of the osteoarthritis, his weight, age, and physical condition. In general,

too little exercise can be more detrimental than too much, however the wrong type of exercise can actually cause harm. While playing Frisbee can be very enjoyable and fun for the dog, it is extremely hard on his joints. It is important to exercise daily; only exercising on weekends, for example, may cause more harm than good. Regular exercise in shorter sessions is always better than long work-outs on weekends. Warming the muscles prior to exercise and following exercise with a “warm-down” period are beneficial. Consult with your veterinarian regarding an exercise program appropriate for your dog.

- **Warmth and good sleeping areas:** Most people with arthritis find that the symptoms tend to worsen in cold, damp weather. Keeping your pet warm, may help him be more comfortable. A pet sweater will help keep joints warmer. In addition, you may want to consider keeping the temperature in your home a little warmer. Providing an orthopedic foam bed helps many dogs with arthritis. Beds with dome-shaped, orthopedic foam distribute weight evenly and reduce pressure on joints. They are also much easier for the pet to get out of. Place the bed in a warm spot away from drafts.
- **Massage and physical therapy:** Your veterinarian or the veterinary staff can show you how to perform physical therapy and massage on your dog to help relax stiff muscles and promote a good range of motion in the joints. Remember, your dog is in pain, so start slowly and build trust. Begin by petting the area and work up to gently kneading the muscles around the joint with your fingertips using small, circular motions. Gradually work your way out to the surrounding muscles. Moist heat may also be beneficial.
- **Making daily activities less painful:** Going up and down stairs is often difficult for arthritic dogs; it can make going outside to urinate and defecate very difficult. Many people build or buy ramps, especially on stairs leading to their yard, to make it easier for their dogs to go outside. Ramps also make car travel easier for arthritic dogs.

Oral Supplements

There are several supplements available at on-line, at Costco, or at drug stores that will help your Golden's mobility.

Glucosamine and Chondroitin: These two compounds that have been widely used to help manage osteoarthritis in both animals and humans. Glucosamine is the major sugar found in glycosaminoglycans and hyaluronate, which are important building blocks in the synthesis and maintenance of joint cartilage in the joint. Chondroitin enhances the synthesis of glycosaminoglycans and inhibits damaging enzymes within the joint. When a dog has hip dysplasia, the joint wears abnormally and the protective cartilage on the surface of the joint gets worn away and the resultant bone-to-bone contact creates pain. Glucosamine and chondroitin give the cartilage-forming cells (chondrocytes) the building blocks they need to synthesize new cartilage and to repair the existing damaged cartilage. These products are not painkillers; they work by actually healing the damage that has been done. These products generally take at least six weeks to begin to help heal the cartilage and most animals need to be maintained on these products the rest of their lives. These products are safe and show very few side effects. There are many different glucosamine/chondroitin products on the market, but they are not all created equal. The best approach is to begin giving a quality Glucosamine/Chondroitin product such as Cosequin before your dog develops problems. Check with your veterinarian for recommendations.

Perna Mussels: Perna canaliculus, or green-lipped mussel, is an edible shellfish found off the shores of New Zealand. The soft tissue is separated from the shell, washed several times, frozen, and freeze-dried. It is then processed into a fine powder and added to joint care products. It is made up of 61% protein, 13% carbohydrates, 12% glycosaminoglycans (GAGs—an important component of connective tissue), 5% lipids, 5% minerals, and 4% water. It also contains glucosamine, a GAG precursor and one of the building blocks of cartilage. Glucosamine and GAGs are the compounds in the mussel believed to contribute to its beneficial effects.

Omega-3 Fatty Acids: Omega-3 fatty acids are often used for the management of the signs of atrophy in dogs. Because of their anti-inflammatory properties, some have advocated their use in dogs with osteoarthritis.

Methyl-sulfonyl-methane (MSM): MSM is a natural, sulfur-containing compound produced by kelp. Sulfur is necessary for the production of collagen, glucosamine, and chondroitin. MSM is reported to enhance the structural integrity of connective tissue, and help reduce scar tissue by altering components that contribute to scar formation. MSM has been promoted as having powerful anti-inflammatory and pain reducing properties, and is thought to work by blocking the pain perception in certain nerve fibers before the pain impulse reaches the brain. (Some Glucosamine/Chondroitin products contain MSM.)

Anti-inflammatory Drugs — check with your veterinarian before giving any drug

NSAIDs: Carprofen (Rimadyl), etodolac (EtoGesic), deracoxib (Deramaxx), firocoxib (Previcox), tepoxalin (Zubrin) meloxicam (Metacam): These are non-steroidal anti-inflammatory drugs (NSAIDs) developed for use in dogs with osteoarthritis. They are very effective painkillers that also reduce inflammation. They are prescription products and because of potential side effects, careful adherence to dosing quantity and frequency must be followed. The manufacturers recommend that patients taking these medications have a thorough physical examination along with appropriate blood-work (especially tests for liver health) performed before starting these medications. In addition, patients taking these products should be periodically monitored to make sure that they are tolerating the medication. These products are often used initially with glucosamine therapy and then as the glucosamine product begins to work, the NSAID dose may be reduced or even eliminated. NSAID's (including aspirin) should never be combined unless directed by your veterinarian. Acetaminophen (Tylenol), and ibuprofen (Advil) have many potential side effects and are **not recommended** without veterinary guidance.

Buffered aspirin: Buffered aspirin is also an anti-inflammatory and painkiller used in dogs. It can be used along with glucosamine/chondroitin products. With all aspirin products used in dogs, there is a risk of intestinal upset or in rare cases, gastric ulceration. Using buffered aspirin formulated for dogs makes dosage and administration much easier.

Corticosteroids: Corticosteroids have been used for many years to treat the pain and inflammation associated with osteoarthritis, however, their use is controversial. Corticosteroids act as a potent anti-inflammatory, but unfortunately, they have many undesirable short and long-term side effects. Because of these side effects and the advent of newer, more specific drugs, corticosteroids are generally only used in older animals with flare-ups where all other pain control products have failed. Corticosteroids are a prescription product and come in both a pill and injectable form.

INJECTABLE DISEASE MODIFYING OSTEOARTHRITIS AGENTS

Polysulfated Glycosaminoglycan (Adequan): Adequan is a product that is administered as an intramuscular injection. A series of shots are given over four week intervals and very often this product produces favorable results. This product helps prevent the breakdown of cartilage and may help with the synthesis of new cartilage. The complete mechanism of action of this product is not completely understood, but appears to work on several different areas in cartilage protection and synthesis. The cost and the inconvenience of injections are a deterrent to some owners, especially with the ease of giving oral glucosamine products.

Prevention

There are many different theories on how to prevent the progression of hip dysplasia. As stated earlier, poor nutrition, inadequate or improper exercise, and increased body weight may all contribute to the severity of osteoarthritis after the hip dysplasia has developed. Following solid recommendations for exercise and nutrition may help, but that will not counteract the effects of poor breeding and genetics.

Prognosis

Prognosis is good for dogs that have had surgery, best for those that have had an FHO or total hip replacement. We have seen remarkable success on certain dogs whose hip dysplasia has been managed medically from a young age.

Elbow Dysplasia (Osteochondrosis)

In osteochondrosis, there is an abnormality of the cartilage and the bone underneath it. In the elbow joint, this most commonly occurs on the medial condyle of the humerus. The cause of osteochondrosis may include genetic factors, trauma, and nutrition. The signs of this abnormal bone growth usually develop between 6 and 9 months of age, and generally appear as lameness. Osteochondrosis is more common in rapidly growing, large breed puppies. In the condition termed osteochondrosis dessicans, a portion of cartilage loosens from the underlying bone. It may break loose and float free in the joint, or remain partially attached to the bone like a flap. In either case, this is an extremely painful situation. If the radius and ulna do not grow at the same rate of speed, a condition called elbow incongruity can occur. This causes wear and tear on the cartilage as the humerus does not meet the appropriate surfaces on the radius and ulna. Thus some points of contact are overloaded and this can lead to fragmentation of the medial coronoid process and other abnormalities.

Symptoms

Patients with elbow dysplasia will usually display an obvious limp, may hold the leg out from the body while walking, or even attempt to carry the front leg completely, putting no weight on it at all. Signs may be noted as early as four months of age. Many affected animals will go through a period between six and about twelve months of age, during which the clinical signs will be the worst. After this period, most will show some signs occasionally, but they will not be as severe. As these dogs continue to mature, there will probably be permanent arthritic changes occurring in the joint. This will cause many obvious problems and it may become necessary to utilize oral or injectable medications to make the animal more comfortable. Elbow dysplasia is therefore a lifelong problem for the affected animals. Some of these patients can be helped with surgery. In some, surgery can even eliminate the problem totally.

Diagnosis

As with hip dysplasia, x-rays done while the dog is sedated will provide the best view of the elbow problem.

Treatment

Treatment of elbow dysplasia varies with what distinct abnormalities are present. Fragmented coronoid process and osteochondrosis are often treated medically, without surgery. The young dog is placed on a regular, low-impact, exercise program (swimming is often preferred). Weight is managed carefully. Medications such as nonsteroidal anti-inflammatory drugs (NSAIDs) are given to decrease pain and inflammation. Depending on the severity of the condition, surgery may be performed to remove the fragmented process or cartilage flap. United anconeal process is usually treated with surgery in which the ununited process is removed. In some instances, small pins or screws may be used to join the process with the rest of the ulnar bone.

Prognosis

Usually, after the dog is 12 to 18 months of age, the lameness will have become less severe and some dogs will function very well. The long-term prognosis (outlook), however, is guarded. Usually, degenerative joint disease (arthritis) will occur as the animal ages, regardless of the type of treatment.

Ruptured Anterior Cruciate Ligament (ACL)

When the anterior cruciate ligament ruptures (is torn), the joint becomes unstable and the femur and tibia can move back and forth across each other. The anterior cruciate ligament is commonly torn when the dog twists on his hind leg. The twisting motion puts too much tension on the ligament and it tears. This often occurs if the dog slips on a slippery surface, makes a sudden turn while running, or is hit by a car. Obesity puts too much weight on the knee and overweight dogs tend to have more occurrences of ruptured cruciate ligaments. It appears that in most dogs with the problem, the ACL slowly degenerates and becomes weaker until it ruptures, without any sudden injury. Many dogs with a degenerating ACL will have the condition in both knees.

Symptoms

Dogs who have ruptured their cruciate ligament will appear suddenly lame, and usually hold the foot of the affected leg off the ground. The knee may become swollen. In time, the dog may start to use the leg again, but often lameness returns. Dogs with a degenerating ACL may also show some pain, and there may be some swelling in the joint.

Diagnosis

The diagnosis of a ruptured cruciate ligament is made through observing abnormal movement of the joint. A veterinarian will place one hand around the femur and one around the tibia in a precise manner. By applying pressure on the knee, the veterinarian will feel the bones move abnormally in what is called a 'drawer sign.' It is called that because the movement of the femur in relation to the tibia is similar to pulling and pushing in the drawer of a cabinet. Radiographs are commonly performed to better assess the amount of arthritis that may be present.

Treatment

Tibial Plateau Leveling Osteotomy (TPLO): One surgery that may be performed is the tibial plateau leveling osteotomy (TPLO). In this procedure, a portion of the tibia is cut, moved, and reattached to a different portion of the tibia using plates and screws. By changing the conformation of the tibia, the joint is stabilized. This is a technically difficult surgery but it has shown to produce excellent results, often with less arthritis. This surgery is especially recommended for dogs over 50 pounds in weight. The recovery period is similar to that with the other surgical procedures--approximately 6 weeks.

Prognosis

Typically a dog with one torn ACL will likely have problems with both. After surgical treatment, dog should be able to live a normal life.

OCD--Osteochondritis dissecans: is a degeneration of bone underlying the cartilage layer of joints. It is often seen in young fast growing dogs of the larger breeds. X-rays often are inconclusive. OCD usually appears in young dogs between six and nine months old. OCD can affect the shoulder, ankle or elbow. It is painful and is first noticed because the dog will limp. Activities like jumping off of high objects, and being overweight are all contributing factors. OCD can sometime heal itself if you keep your pet quiet with very limited activities. The only other alternative is surgery which will resolve the problem effectively.

NEUROLOGICAL/NEUROMUSCULAR DISEASES

Epilepsy

Idiopathic epilepsy (seizures of unknown origin) is most commonly seen in otherwise healthy animals, between the ages of 1 and 5 years, and may be inherited in certain breeds. Idiopathic epilepsy is diagnosed when other causes of seizures have been ruled out by a physical exam, blood work, and any other necessary work up procedures. While “observing”, the owner should keep a diary of when/where the seizures occur, how long they last, was the animal acting strangely/doing any activity in particular before the seizure, and how long after the seizure did it take for the animal to be ‘normal’. This may provide a clue if a pattern is noticed. A dog may require medication. The general rule of thumb for beginning to medicate is more than one seizure every one or two months. The duration and severity of each seizure needs to be evaluated by a veterinarian.

Treatment

The most common medication used for maintenance seizure control is Phenobarbital. Emergency situations usually call for Diazepam (Valium) to get immediate control of the seizure. Potassium Bromide is an old anticonvulsant medication, used since the 1800's, that is used in veterinary medicine, often with positive results. It can be used in conjunction with Phenobarbital (lessening the amount of Phenobarbital that is needed) or it can be used alone. Potassium bromide does take several weeks to reach therapeutic levels in the blood. Phenobarbital takes several days-weeks, too. During the initial period of Phenobarbital, the animal may appear groggy; this usually goes away with time. If not, the vet should be notified, and the dosage adjusted to maintain a ‘normal’ animal and not have seizures. There are other medications, but these are the most common.

Laryngeal Paralysis

The most common medication used for maintenance seizure control is Phenobarbital. Emergency situations usually call for Diazepam (Valium) to get immediate control of the seizure. Potassium Bromide is an old anticonvulsant medication, used since the 1800's, that is used in veterinary medicine, often with positive results. It can be used in conjunction with Phenobarbital (lessening the amount of Phenobarbital that is needed) or it can be used alone. Potassium bromide does take several weeks to reach therapeutic levels in the blood. Phenobarbital takes several days-weeks, too. During the initial period of Phenobarbital, the animal may appear groggy; this usually goes away with time. If not, the vet should be notified, and the dosage adjusted to maintain a ‘normal’ animal and not have seizures. There are other medications, but these are the most common.

Treatment

In most cases, surgery is needed. The most common type of surgery for this condition is a procedure called an 'arytenoid lateralization,' sometimes also known as a 'laryngeal tie-back' surgery. This involves putting one or more permanent sutures in place to hold the arytenoid cartilage open so that adequate air can pass through. Most dogs do quite well after this surgery, although there is a small risk of bleeding during the surgery, aspiration (inhalation) of stomach contents during surgery, or aspiration of food and water after the surgery. The surgery is usually only done on one side, which provides increased airflow with less risk of aspiration.

Megaesophagus

Canine megaesophagus occurs when the muscles of the esophagus fail and it cannot propel food or water into the stomach. The result is that ingested food sits in the esophagus within the chest cavity and never makes it to the stomach. The most serious complication is that digestive fluid/food will at some point pool in the esophagus which generally results in aspiration of digestive fluid/food, leading to pneumonia. Megaesophagus can be secondary to other diseases such as Myasthenia Gravis, Thyroid, Addison's and other Neurological disorders. Symptoms include regurgitation of water, mucous or food. (Regurgitation is throwing up without any warning; "vomiting" is associated with retching.), loss of appetite or refusal to eat, sudden weight loss, swallowing difficulty, exaggerated and/or frequent swallowing and sour and/or foul smelling breath. They will also try to clear their throat frequently with a "hacking" sound. Many canines may be mis-diagnosed with a gastro-intestinal problem.

Treatment

In this case, the disorder can be managed. A low-fat or low residue canned food fed in a milkshake consistency while the dog is in an upright position works best. Multiple feedings, 3-4 meals per day, is also suggested. Fluids must be consumed in the vertical position as well. Medications may include an acid reducer (like Pepcid-AD or Prilosec) 1 or 2 times per day and motility drugs (metoclopramide/Reglan, cisapride/propulsid/, low dose erythromycin) to help empty the stomach to minimize reflux from the stomach into the esophagus. Some cases of megaesophagus are congenital and may be corrected surgically. These cases are usually diagnosed in young puppies.

"Old Dog" Vestibular Disease

The vestibular system is composed of portions of the brain and ear and is responsible for maintaining our sense of balance. When something goes wrong with the vestibular system, it feels like the world is spinning. Dogs with idiopathic vestibular disease have some combination of the following symptoms: a head tilt; they are unsteady on their feet and may fall over; they circle in one direction or even roll across the floor; their eyes flick back and forth, up and down, or rotate in a circle (this is called nystagmus); an unwillingness to eat due to nausea and vomiting. These clinical signs are not unique to idiopathic vestibular disease. Infections, tumors, inflammatory diseases and other conditions can all adversely affect a dog's vestibular system, so a thorough physical exam is necessary. But when the symptoms seemingly appear out of nowhere in an older dog and then start to improve over the course of a few days to weeks, idiopathic vestibular disease is usually the cause. If the dog starts to get better in a few days and is more or less back to normal in a few weeks, additional diagnostic testing is not necessary. If that is not the case, or if the initial physical exam is not fully supportive of idiopathic vestibular disease, blood work, X-rays, CT scans, MRIs, and other tests may be necessary to reach a definitive diagnosis. Most dogs with idiopathic vestibular disease recover fully. Others have mild but

persistent neurologic deficits (e.g., they have a head tilt or wobble a bit when they shake their heads), but these are rarely serious enough to adversely affect their quality of life. Dogs can have more than one bout of idiopathic vestibular disease as the age, but since the symptoms look familiar to owners, they usually don't panic the second or third time around. Idiopathic vestibular disease isn't always benign. There are some cases where dogs have needed to be euthanized because dogs have been severely affected and have failed to recover sufficiently.

HEART DISEASE OR DISORDERS

Subaortic Stenosis

Sub aortic stenosis or SAS is a congenital heart disease where the dog is born with very small ridge near the valve, causing a heart murmur. The prognosis for this disease depends on the severity of the narrowing. Animals with mild sub-aortic stenosis usually have normal life spans and exercise tolerance. Dogs with moderate SAS generally have decreased exercise tolerance, but can have normal life spans. Some of these dogs with moderate SAS will die suddenly at an early age (from 3-7 years of age). Dogs with severe SAS generally have decreased exercise tolerance, and die suddenly at early ages, from 2-4 years of age, although the rare animal may live considerably longer.

Treatment

Treatment options for dogs with SAS depends on the severity of the disease. Dogs with mild disease need no medication or limitations. Dogs with moderate to severe disease may benefit from medication with a beta blocker, but this has not been definitively proven. Dogs with severe disease should be placed on medication with a beta blocker, even though this has not been proven to be beneficial, because the theoretic benefits are substantial. Surgery can be performed, but this is an open heart surgery, and is quite expensive. This surgery is available at very few universities.

Cardiomyopathy

Cardiomyopathy involves inflammation and scarring of the heart muscle. It makes the heart less efficient for pumping blood through the dog's body to his organs. Usually, the lower chamber and the upper chamber lose their ability to pump blood. This causes fluid to back up into the lungs if it's the left side and into the abdomen or area around the lungs if it's the right side. Between six months and two years, the condition leads to congestive heart failure and death if the illness is not quickly diagnosed and treated.

Treatment

The only known treatment is drugs such as Lanoxin, Digoxin, or Digitalis prescribed by the veterinarian. These medications help the heart pump better and slow its rate if arrhythmias (irregular, speeded up heartbeats) exist. Some veterinarians recommend that owners of dogs with arrhythmias buy a stethoscope and keep a log of the dog's heart rate. Dogs treated with these drugs should be carefully watched for toxicity. Loss of appetite, vomiting, diarrhea, and lethargy should be reported to the veterinarian immediately.

Heart Murmurs

The symptoms associated with murmurs depend on a variety of characteristics, including their grade, configuration, and location. If, however, the murmur is associated with structural heart disease, your dog may display signs of congestive heart failure such as coughing, weakness, or exercise intolerance.

Grading Scale for Murmurs

Grade I—barely audible

Grade II—soft, but easily heard with a stethoscope

Grade III—intermediate loudness; most murmurs which are related to the mechanics of blood circulation are at least grade III

Grade IV—loud murmur that radiates widely, often including opposite side of chest

Grade V—very loud, audible with stethoscope barely touching the chest; the vibration is also strong enough to be felt through the animal's chest wall

Grade VI—very loud, audible with stethoscope barely touching the chest; the vibration is also strong enough to be felt through the animal's chest wall

Diagnosis

In order to determine exactly what is causing the symptoms, your veterinarian must differentiate between a wide range of abnormal heart sounds -- split sounds, ejection sounds, gallop rhythms, and clicks, for example. He or she also must differentiate between abnormal lung and heart sounds, and listen to see if timing of abnormal sound is correlated with respiration or heartbeat. The location and radiation of the murmur, as well as the timing during cardiac cycle, is another way to determine the underlying cause. This can be accomplished by conducting a variety of tests, including chest X-rays, Doppler studies, and echocardiography. A complete blood count, meanwhile, is one of the preferred methods for confirming anemic murmurs.

Treatment

Unless heart failure is evident, your dog will be treated as an outpatient. The course of treatment will be determined based on the associated clinical signs. Puppies with low grade murmurs, for example, may require little or no treatment and the murmur may resolve itself within six months. Routine diagnostic imaging is recommended for dogs with murmurs.

Chylothorax

Chylothorax is a medical condition that is caused by the accumulation of lymphatic fluid in the chest. The lymphatic fluid that gathers in the dog's chest is also known as chyle, which is a fluid that is filled with fat and proteins or other substances. Chylothorax may affect any dog breed, but may be more common in certain breeds (i.e., Afghan Hounds). Typically, the disease will occur after the age of five. The real causes of chylothorax are not well determined. Some dogs that have heart disease, blood clots, heartworms or tumors develop chylothorax more often, so the condition has been linked to these underlying problems. The accumulation of fluid in the thorax or chest cavity will cause the dog to have breathing problems. You may also notice a few symptoms such as: excessive panting; coughing; lethargy; sudden fainting; decreased appetite. The vet should know about the symptoms of the dog, so do let him know about everything you've noticed. The vet will perform a fluid absorption test using a syringe, to extract the fluid from the chest. The fluid will be analyzed and the vet will determine if the dog has chylothorax. The vet will run additional tests to see if the dog is affected by other medical conditions that have been associated with chylothorax. These tests may include: X-rays; ultrasounds (especially the heart), and possibly a biopsy (if a tumor is suspected)

Treatment

The vet will focus on removing as much fluid from the chest cavity as possible. The dog will also have to be kept under IV fluids. There are a few experimental drugs (such as Rutin) administered for dogs with chylothorax. These may be used and should absorb the fluid from the chest cavity. Periodical chest taps will be needed to remove the fluid that may accumulate in the chest cavity. If the dog is affected by an underlying disease causing chylothorax, the vet will administer additional treatment. The dog should receive a special diet that is low in fats, but has the necessary nutrients to keep him in good health. Periodical x-rays will have to be performed to determine the amount of fluid left in the chest cavity and whether the fluid levels increase. In some cases, chylothorax may resolve in a few months, provided the dog gets the necessary diet. Surgery may be recommended if the condition doesn't improve in a few months or seems to get worse. Surgery is needed, as the fluid can cause severe scars and damage the lungs in the long run. Due to the fact that chylothorax is an idiopathic disease, there are no preventive measures to stop the formation of chyle fluid in the thorax. However, heart disease may be prevented with an active lifestyle and a suitable diet. Heartworm medication may also be administered to prevent the infestation with worms, which can be associated with chylothorax.

EYE DISEASES

Entropion

Entropion, a congenital condition, is a rolling-in of the eyelid. This causes the hair on the surface of the eyelid to rub on the eyeball, which is both painful and often causes corneal ulcers or erosions. The corneal damage can also result in corneal scarring, which can interfere with vision. Usually the dog will squint and tear excessively.

Treatment

Entropion is treated by surgical correction, blepharoplasty, which is essentially plastic surgery. Excessive folds and sections of facial skin are removed, and the eyelids tightened. It is uncommon for entropion to recur after surgery.

Eyelid Tumors

Older dogs commonly develop eyelid tumors, and can sometimes be cancerous. Fortunately, eyelid tumors in dogs are usually benign and do not spread to distant tissues. However, some eyelid tumors grow quickly, and can destroy the structure of the eyelid, in addition to rubbing on the eye. It is usually best to remove them when they are still small.

Treatment

Eyelid tumors are treated by surgical removal. While there are many different surgical procedures possible, most eyelid tumors in old dogs can be removed at the eye care specialist without requiring general anesthesia. The dog is given a sedative, and a local eyelid anesthetic is given to numb the eyelid prior to tumor removal. Larger tumors may require surgical removal while under anesthesia.

Cataracts

The word cataract literally means 'to break down.' This breakdown refers to the disruption of the normal arrangement of the lens fibers or its capsule. This disruption results in the loss of transparency and the resultant reduction in vision. Cataracts often appear to have a white or crushed ice appearance and are found in the lens of the eye. Some cataracts are inherited and in Golden Retrievers will usually appear after 6 months of age. The most common metabolic disorder resulting in cataract

formation in the dog is diabetes mellitus. In diabetic dogs, the glucose concentrations in the lens increases. Trauma from an automobile accident, or penetration of a thorn, shotgun pellet, or other object may damage the lens and a cataract may develop. These types of cataracts usually only occur in one eye and can be treated successfully with surgical removal.

Treatment

Treatment for canine cataracts consists of surgical removal of the lens. Currently, there is not a good non-surgical treatment for this condition. For a successful outcome, the affected animal must undergo a thorough examination to determine if he is a good surgical candidate. Diabetic animals that are not regulated, aggressive animals that are difficult to treat daily, or animals in poor or failing health, are not good surgical candidates.

Glaucoma

Glaucoma is increased pressure within the eye. The balance of fluid production and drainage is responsible for maintaining normal pressure within the eye. In glaucoma, the drain becomes clogged but the eye keeps producing fluid. Therefore, the pressure in the eye increases. The increased pressure in the eye actually can cause the eye to stretch and enlarge, in addition to blinding the eye. Glaucoma is very painful and can cause blindness rapidly. The only way to know for sure if a Golden has glaucoma is to have the intraocular pressures measured by a veterinarian. Signs of glaucoma can include a red or bloodshot eye and/or cloudy cornea. Vision loss is also characteristic of glaucoma.

Treatment

Glaucoma can be very expensive to treat. There are several different types of expensive eye drops and pills that help decrease fluid production or increase fluid drainage from the eye. While these medications are helpful in animals, they usually do not control glaucoma long term. Consequently, they are used mostly to help prevent or delay the onset of glaucoma in the remaining visual eye, and as temporary treatment until surgery can be performed in the affected eye. The type of surgical procedures available for glaucoma depends upon whether the eye still has the potential for vision. For eyes that still have visual acuity, intraocular pressure can be reduced by performing a cycloablation procedure and a drainage implant procedure. For permanently blind eyes, the eye can be removed (enucleated) with the option of placing a sterile prosthetic ball implant in the eye socket prior to skin closure, an implant placed inside the eye giving the pet a partially artificial eye, or an injection of a drug into the eye that kills the fluid-producing cells and reduces the pressure.

PRA(Progressive retinal atrophy)

PRA is a disease of the retina causing the dog to become night blind and eventually their daytime vision fails. As their vision deteriorates, affected dogs will adapt to their handicap as long as their environment remains constant, and they are not faced with situations requiring excellent vision. At the same time the pupils of their eyes become increasingly dilated, in a vain attempt to gather more light, causing a noticeable "shine" to their eyes; and the lens of their eyes may become cloudy, or opaque, resulting in a cataract. In Golden Retrievers, this is a disease that occurs in older dogs. Diagnosis of PRA is normally made by ophthalmoscope examination. This is undertaken using an instrument called an indirect ophthalmoscope, and requires dilatation of the dog's pupil by application of eye drops. PRA is a genetic progressively blinding disease, and removing the cataractous lens does not "fix" the retina. It must be emphasized that the overwhelming majority of dogs with PRA are not suitable candidates for cataract surgery. It is also important to know that advanced cataracts can cause inflammation and subsequent pain and further damage to the eye; therefore, if cloudiness and/or pain

develop in the eye(s) of dogs with PRA, ophthalmic re-examination by a veterinary ophthalmologist is recommended ASAP. Secondary painful complications that might occur include glaucoma and lens luxation.

Treatment

In many cases, dogs with PRA do lose their vision, however, affected dogs that still have some vision may benefit from specific antioxidant supplementation to support retinal and lens health. A blind dog can be very happy as long as a routine is maintained and obvious hazards are eliminated

Retinal Dysplasia

Retinal dysplasia is a type of retinal malformation when the 2 developmental layers of the retina do not unite properly. **Retinal dysplasia is not progressive.** It is a congenital defect and animals are born with as severe a condition as they will ever get. Retinal dysplasia can be detected as early as 6-8 weeks on a CERF examination. However, because the size of the eye is small and young puppies are often wiggling during examination, a re-examination is recommended 6 months later in order for the ophthalmologist to better see the back of the eye. The cause of retinal dysplasia in most breeds is genetic although prenatal infections with herpes virus and parvovirus may also lead to it.

Treatment

There is no effective treatment for RD. The only way to prevent it is to make sure that the active carriers of RD gene do not breed.

TUMORS AND CANCER

Hemangiosarcoma

Hemangiosarcomas are a form of cancer which originates in the endothelium, which is the lining of blood vessels and spleen. As might be expected of a tumor arising in the blood system they are highly malignant and can be found almost anywhere in the body since blood vessels are necessary in almost all body tissues. There is a strong predilection for the spleen, pericardium and heart. These tumors are most common in middle aged or older dogs. Because these tumors arise in internal organs there is often little warning that they are present prior to time they cause severe clinical signs of disease. A common estimate of the average time from discovery of the tumor until death occurs in affected dogs is six to eight weeks but death occurs more rapidly than this in a number of cases. Visible bleeding, usually in the form of nosebleeds, and signs associated with blood loss, such as tiring easily, episodes of unexplained weakness, pale color to the mucous membranes of the mouth and eyes, increased respiratory rates; abdominal swelling and depression are the most common presenting signs for patients with hemangiosarcoma. A few dogs just suddenly die with no clinical signs having been noted by their families prior to death.

Treatment

If a tumor is identified when it is small it may be possible to remove the spleen if the tumor is there or even to remove tumors found near the heart and prolong the pet's life. Most of the time this will not make much difference, though. These are highly malignant tumors and most have spread by the time they can be identified. There is not a very successful chemotherapeutic or radiation protocol for this cancer at this time, but dogs treated with chemotherapeutic agents do live a little longer than dogs that do not receive this treatment.

Lymphosarcoma

Lymphosarcoma (lymphoma) is a malignant cancer that involves the lymphoid system. Lymphoid tissue normally is found in many different parts of the body including lymph nodes, liver, spleen, gastrointestinal tract and skin. Lymphosarcoma is classified according to the location in the body in which the cancer begins. In dogs, the most common form of lymphosarcoma is in the lymph nodes. Frequently, owners notice lumps under the neck or in other locations. These lumps represent the enlarged lymph nodes. Dogs still may feel normal at this point in the disease or may have vague symptoms such as lethargy or decreased appetite. Symptoms include enlargement of external lymph nodes, vomiting, diarrhea, loss of appetite, weight loss, lethargy, difficulty breathing and increased thirst or urinations. Diagnosis is made using needle aspirate of the lump and/or a biopsy.

Treatment

Chemotherapy (most common form of treatment), radiation therapy (for localized disease) and surgery (for localized disease)

Osteosarcoma

Osteosarcomas account for only 5% of all canine tumors, but 80-90% of malignancies involving the bone. Osteosarcoma is an aggressive cancer of the bone that often requires amputation of the affected limb coupled with chemotherapy to provide temporary relief from this aggressive disease. The symptoms of osteosarcomas are often closely associated with their location. Most osteosarcomas develop on the limbs of dogs below the elbow or near the knee. The tumors usually form at or near the growth plates. Affected dogs will often have a pronounced bone swelling. X-rays often reveal a characteristic bone pattern that, coupled with history and breed, may indicate the development of an osteosarcoma. These tumors often produce pain in the joint that can first be detected as lameness in the affected limb. Up to 90% of these tumors will have metastasis to the lungs at the time of diagnosis, but because of the small initial size of the metastases, less than 10% will initially show up on a chest x-ray. Because of this high incidence of metastasis, all dogs with osteosarcomas are treated as if they have metastasis to the lungs regardless of the findings on the initial lung x-rays. Osteosarcomas will occasionally show up at different locations and likewise other tumor types can initially appear to be an osteosarcoma. Because of this possibility, a biopsy is always recommended. Fungal bone infections can produce similar symptoms and appearance on an x-ray, so a fungal culture is often performed to help clarify the diagnosis.

Treatment

Osteosarcoma is an aggressive, highly metastatic cancer that requires an aggressive treatment protocol. Once the tumor has been positively identified as an osteosarcoma, the affected limb is usually amputated. In rare cases where the tumor is in the right location, some limb-sparing surgeries have been performed, but that is not usually the case. After the amputation, a course of chemotherapy is usually begun. The most successful drugs have been carboplatin and cisplatin. Carboplatin is more expensive, but safer and easier to administer. Doxorubicin is sometimes used as well. A qualified veterinary oncologist is often the best source of information and he or she will be aware of the newest chemotherapy protocols. The life expectancy of a dog with a properly identified and treated osteosarcoma varies greatly, but can approach a year or longer.

Mastocytoma

Mast cell tumors, also called mastocytomas, arise most commonly in the skin. They develop from a normal component of body tissues called the mast cell that play a role in the process of tissue repair by releasing inflammatory mediators. Malignant mast cell tumors can spread to the lymph nodes,

spleen, liver and bone marrow. Mast cell tumors are among the most common tumors of dogs, accounting for approximately 20 percent of all skin tumors. The cause of mast cell tumors is unknown. Dogs that develop mast cell tumors often are older (usually 8 to 9 years of age), although they can occur in dogs of all ages. Symptoms include round, raised masses in the skin, lack of appetite, vomiting, abdominal pain and black tarry stools due to bleeding in the upper intestinal tract. Diagnosis will require a needle aspirate of the affected area; a complete blood count and serum biochemistry profile; a buffy coat smear look for rare circulating mast cells; X-rays of the abdomen to evaluate liver and spleen size; abdominal ultrasound, if further evaluation of the liver and spleen is needed to detect masses and abnormal tissue densities within the spleen or liver as x-rays usually only show generalized enlargement.

Treatment

Treatment includes surgical removal of the tumor; radiation therapy for local control of a less well-differentiated skin tumor and chemotherapy in selected cases. Prognosis is better with early detection and by surgically obtaining good margins.

Prognosis of mast cell tumors

Prognosis for MCT is directly related to the site of growth and tumor stage and grade. Complete removal of a grade 1 tumor usually results in an excellent prognosis. Dogs that are tumor-free after six months are considered unlikely to have a recurrence. Primary tumors that originate in areas other than the skin tend to be more aggressive. Mast cell tumors of the prepuce, groin, nail bed, and oral regions are generally the most malignant. Tumors of bone marrow or internal organs/tissue have a particularly grave prognosis. Pets showing systemic signs and those whose tumors return after surgical removal also have a poor prognosis. Similarly, the faster the growth of the tumor, the more critical the case. A personalized treatment plan is important to slow the progression of MCT. Talk to your veterinarian regarding the best treatment protocol for your pet. Treatment includes surgical removal of the tumor; radiation therapy for local control of a less well-differentiated skin tumor and chemotherapy in selected cases. Prognosis is better with early detection and by surgically obtaining good margins.

Spindle Cell Carcinoma

Spindle cell carcinoma in dogs (carcinoma is a term for any malignant cancer that arises from epithelial cells) is a term for tumors arising in connective tissues, blood and smooth muscles. Spindle cell carcinoma may develop in any part of a dog's body and the tumors may continue to grow or ulcerate. The connective tissues fill spaces between the organs forming tendons and ligaments. Most spindle cell tumors are solid with or without fluid in them and usually remain in the same place for a long time.

Treatment

Surgery is usually the preferred option to remove the tumor. Amputation may be necessary if the tumor is located on an extremity. Radiation therapy may be used; however, chemotherapy does not seem to have any effect. This tends to be a recurrent tumor because it is not possible to get adequate surgical margins. Low grade (slow growing) tumors have a recurrence rate of 25% after surgical excision. Median survival time is 2-4 years. High grade tumors (which are rare) have 62% local recurrence and median survival time of 49 weeks.

Squamous Cell Carcinoma

Squamous cell carcinoma is a malignant form of cancer which occurs most commonly in the skin, feet and mouth but they can also occur in the eyes, lungs, esophagus and bladder as well as at other sites. These masses may vary in appearance and may look like a shallow sore on skin of the dog with a crust over the top of the sore; a deep raw sore on the skin of the dog; a raised area on the skin of the dog

which appears red in color; or a cauliflower-shaped growth on the skin of the dog. Diagnosis of squamous cell will require a cytology study, done by collecting cells from the area with a needle or by using a slide or other object pressed directly on the top of the area to collect the cells. Removal of at least part of the tumor and biopsy of the tumor may be necessary to accurately diagnose squamous cell carcinoma in your dog. A veterinarian will likely need to do some additional tests which may include blood testing, analysis of urine, radiography of the chest and radiography and/or ultrasound of the abdomen. The dog's lymph nodes will also need to be examined to see if the tumor has spread to the lymph nodes. These tests are done to help determine the stage of the cancer.

Treatment

Surgical removal of the squamous cell carcinoma is the treatment of choice, but removal of the entire tumor may not always be possible because of the size or location of the cancer. In that case, additional treatment may be needed and may include cryotherapy (application of extreme cold to the area of the cancer lesion); radiation therapy; plesiotherapy (topical application of a radiation source to the area of the cancer); photodynamic therapy (administration of a medication which will photosensitize the area of the cancer and will result in death of cancer cells) and chemotherapy. Squamous cell tumors which can be removed entirely carry a much better prognosis than those which cannot be removed surgically. Squamous cell carcinoma tumors detected and treated while they are small and in the early stages of development carry the best prognosis.

CHEMOTHERAPY

There are many good canine oncologists available. Some will recommend standard chemotherapy options; others will prefer a more holistic approach using Chinese herbs; and some will have a more integrative approach using both. Chemotherapy treatments have advanced beyond what was previously available. Injectable chemotherapy is the most well studied form of treatment for dogs with osteosarcoma. There are three drugs that are effective for this disease: doxorubicin, cisplatin, and carboplatin. Numerically, the outcomes are similar for each drug, though it is important to point out that no one has adequately performed the perfect study comparing the efficacy of each drug in a "head to head" fashion. Veterinarians will generally say the prognosis for dogs treated with amputation alone is about 4-5 months. With additional chemotherapy with doxorubicin, cisplatin, or carboplatin, survival is extended to about 12 months, with approximately 10-15 percent of dogs surviving two years.

Doxorubicin is an intravenous drug given once every three weeks for a total of five treatments. This drug is usually well tolerated but has a moderate chance of causing upset stomach signs. There is a risk for toxicity to the heart; a problem seen when dogs receive more than six lifetime dosages, which is one of the main reasons we stop at five treatments.

Cisplatin is an intravenous form of chemotherapy administered once every three weeks for a total of four treatments. Of the three drugs, it is the one most likely to cause side effects in dogs. It is an example of a chemotherapy drug that can immediately cause nausea and vomiting, so it must be administered with anti-nausea medications. This drug can also be directly toxic to the kidneys, so it must be administered with an all-day intravenous fluid diuresis.

Carboplatin is also an intravenous drug given once every 3-4 weeks for a total of five treatments. Side effects are uncommon, but it can definitely cause lowered white blood cell counts.

Metronomic chemotherapy is one example of angiogenesis inhibition treatment, which is becoming a popular treatment option for pets with cancer. The definition of metronomic chemotherapy is variable, but usually refers to the continuous administration of low doses of oral chemotherapy drugs designed to target the endothelial cells lining the blood vessels supplying tumor cells. Metronomic chemotherapy entails the chronic administration of low-dosages of chemotherapy, so theoretically the inhibitory impact on the tumor blood vessel growth is maintained, but the dose is insufficient to cause damage to healthy cells. Historically, metronomic chemotherapy in veterinary medicine consisted of the combination of low doses of oral cyclophosphamide with a non-steroidal anti-inflammatory drug (Feldene/Piroxicam ®), and in some cases, an antibiotic (Doxycycline). Since its inception, several other drugs have been examined as metronomic therapy, including veterinary approved non-steroidal anti-inflammatory drugs (e.g., Metacam) and other chemotherapeutic drugs (e.g., Lomustine [CeeNu®] and chlorambucil [Leukeran®]) Some veterinarians believe that it's utilized most effectively in patients where they suspect microscopic cancer cells are present, but at levels where they are unable to detect them. Splenic hemangiosarcoma is a very aggressive type of cancer in dogs, and even when the primary tumor is removed via splenectomy and there is no evidence of spread at the time of surgery, most dogs will go on to develop metastases within just a few short weeks to months. Soft tissue sarcomas typically present us with the exact opposite challenge. They are extremely difficult to remove completely with surgery, but usually have a low chance of spread. Though not perfect in their design, in those studies, dogs that underwent treatment with metronomic treatment survived longer and had longer time to tumor regrowth when compared with dogs treated with surgery alone.

Metronomic chemotherapy is used to treat a variety of cancers in veterinary patients, other than those listed above. It typically is most effective in cases where the primary tumor is adequately controlled (e.g., with surgery and/or radiation therapy), and there is no evidence of spread, AND that patient has undergone the current standard of care of treatment.

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