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Canine Uveitis and the Veterinary Technician

Canine uveitis can have a big impact on the veterinary nursing team, and yet few technicians know the dangers that can be associated with it. Technicians should think twice when they see a dog with cloudy eyes and take the proper safety precautions. Uveitis can also be a confusing and frustrating diagnosis for owners to receive, so it is essential to have an informed veterinary team to assist clients.

ANATOMY OF THE EYE

The eye is divided into 3 chambers, all of which can be affected by uveitis (**FIGURE 1**). The *anterior chamber* is the space between the cornea and the iris, which is the anterior-most portion of the eye. The *posterior chamber* is the space between the iris and the lens. The *posterior segment* consists of the space between the lens and the retina.

Three layers, or tunics, compose the eye. The *sclera* is the white part of the eye that helps the eye hold its shape. The *choroid* lies between the sclera and the retina. The *retina* lines the back of the innermost portion of the eye and collects light in its rods and cones for transport to the brain, creating vision.

The *uvea* is the vascular component of the eyeball and consists of the iris, ciliary body, and choroid. The uvea and its components are responsible for producing aqueous humor and maintaining the blood-eye barrier. Aqueous humor is the fluid in the anterior chamber that helps the eye keep its shape; it is constantly being made by the ciliary body and drained through the drainage angle. The uvea also includes the muscles that regulate constriction and dilation of the pupil.

FIGURE 2. Blue-eyed 7-year-old basset hound mix with uveitis causing the iris to appear yellow.



PEER
REVIEWED

MEET THE AUTHOR



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WHAT IS UVEITIS?

Uveitis is defined as inflammation of the uveal tract of the eye. Anterior uveitis is inflammation of the iris and ciliary body, and posterior uveitis is inflammation of the choroid. Panuveitis is inflammation of both the anterior and posterior areas of the eye.

A breakdown in the barrier between the eye and the blood supply allows white blood cells and other inflammatory proteins to leak from the vasculature into the eye, causing inflammation of the uveal tract. This will often cause the eye to have a hazy appearance, and normally blue irises may even appear yellow due to inflammation of the iris (FIGURE 2).¹

CLINICAL SIGNS

The diagnosis of uveitis is made during an eye examination. A basic eye examination consists of checking the pupillary light reflex (the pupil should constrict with bright light) and measuring intraocular pressure, when possible. Increased outflow of fluid from the eye causes an initial drop in eye pressure (ocular hypotension), and a measurement of <5 mm Hg is supportive of a diagnosis of uveitis.²

The presence of aqueous flare is pathognomonic for uveitis. Aqueous flare is seen when a small, direct beam of light creates a “headlights in fog”

• **TECHPOINT** •

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effect in the anterior chamber, known as the *Tyndall effect*.¹ In one study, approximately 86% of dogs with uveitis presented with aqueous flare.³

In patients with uveitis, the pupils often become miotic (constricted) due to ciliary spasm. Ciliary spasm can be very uncomfortable and may lead to blepharospasm (squinting) and epiphora (increased tearing).

Episcleral erythema—redness of the sclera—is another common condition seen with uveitis. Episcleral erythema can be differentiated from

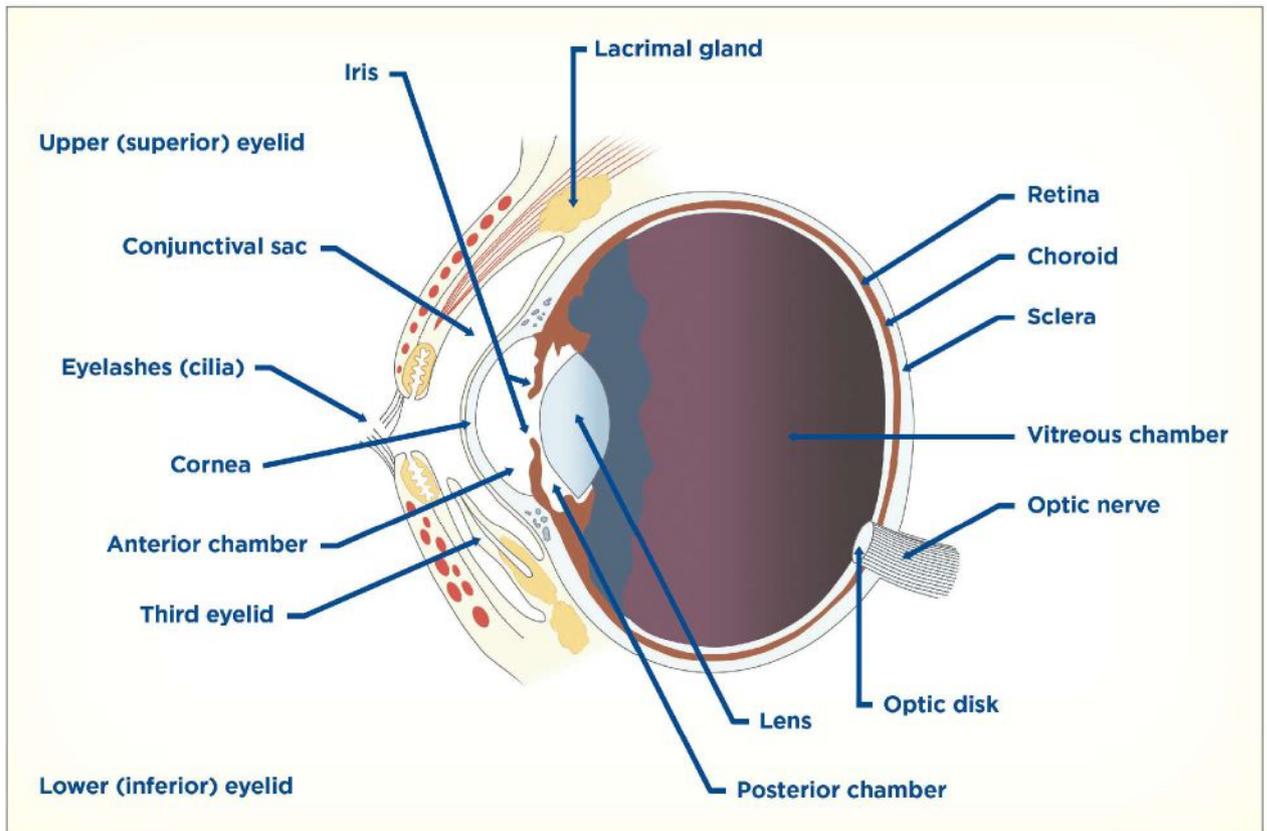


FIGURE 1. Anatomy of the canine eye.

conjunctivitis by topical application of epinephrine or phenylephrine; this causes constriction of the superficial blood vessels of the conjunctiva but not the deeper vasculature of the episclera.²

Uveitis may also cause hyphema (red blood cells in the anterior chamber) and hypopyon (white blood cells, or pus, in the anterior chamber), as well as corneal edema.

PATHOLOGY

Uveitis can be unilateral (one eye) or bilateral (both eyes). Both unilateral and bilateral uveitis can have a systemic cause. Uveitis can also be either acute or chronic. Treatment of uveitis and the possible underlying cause is essential for the preservation of comfort and vision.⁴

Ciliary flush, which is the growth of corneal blood vessels, may be stimulated by chronic uveitis.

Chronic uveitis may cause adhesions of the iris to the lens, known as posterior synechiae, or adhesions of the iris to the cornea, called anterior synechiae. Both posterior and anterior synechiae can prevent drainage of aqueous humor from the eye. This causes an increase in intraocular pressure, known as secondary glaucoma. Glaucoma can be a chronic, very painful, and blinding condition that often requires surgical intervention for patient comfort.

Uveitis of the posterior segment can cause an accumulation of inflammatory fluid underneath the retina. It is possible for this fluid to push the retina off of the choroid. Detachment of the retina from the choroid causes blindness.



FIGURE 3. Seven-year-old chihuahua with a history of traumatic uveitis leading to phthisis bulbi in the left eye.

ETIOLOGY

The cause of the disruption of the blood-eye barrier during uveitis can be external (eg, trauma, corneal ulceration or perforation; **FIGURE 3**) or internal.² There are many internal causes of uveitis (**BOX 1**), therefore, an extensive medical history

BOX 1 Potential Causes of Canine Uveitis

INFECTIOUS

Bacterial

- *Borrelia burgdorferi* (Lyme disease)
- *Brucella canis*
- *Ehrlichia canis*
- *Leptospira* species
- *Rickettsia rickettsii* (Rocky Mountain spotted fever)

Fungal

- *Aspergillus* species
- *Blastomyces* species
- *Coccidioides* species
- *Cryptococcus* species
- *Histoplasma* species

Viral

- Adenovirus (canine infectious hepatitis)
- Distemper virus
- Herpesvirus
- Rabies virus

Parasitic

- *Dirofilaria immitis*
- *Leishmania* species
- *Toxoplasma* species

Other

- *Prototheca* species
- Septicemia

NONINFECTIOUS

- Coagulopathies
- Diabetes mellitus
- Hyperlipidemia
- Hypertension
- Immune-mediated or idiopathic uveitis
- Lens-induced uveitis (eg, cataracts)
- Pigmentary uveitis in golden retrievers
- Primary neoplastic disease (eg, ocular melanoma)
- Secondary neoplastic disease
- Trauma
- Ulcerative keratitis
- Uveodermatologic syndrome

and diagnostic evaluation is necessary to investigate possible systemic causes. Evaluation should start with a complete physical examination, as well as a complete blood count (CBC) and biochemistry profile.¹ Infectious disease testing should be performed based on individual history and geographic location.

Cataracts (all stages) can cause an immune-mediated form of uveitis. The immune system reacts to lens proteins from the cataract leaking out of the lens capsule. Treatment of uveitis in dogs with cataracts is necessary not only before cataract surgery, to preserve the potential for vision, but also for long-term comfort.¹

In one study of causes of uveitis in 102 dogs, 25% were diagnosed with metastatic neoplastic disease.³ For this reason, chest radiographs and abdominal ultrasound can be valuable tools when identifying possible causes of uveitis.

Unfortunately, in some cases of uveitis an underlying condition cannot be identified. These cases are presumed to be idiopathic or immune-mediated after a thorough process of elimination. In the above study, 58% of dogs examined with uveitis were diagnosed with idiopathic or immune-mediated uveitis.³

The remaining 17% of dogs in the study were diagnosed with uveitis caused by infectious disease.³ Infectious causes of uveitis include bacterial, fungal, viral, and parasitic agents.

ZOONOTIC POTENTIAL

Many infectious diseases can cause uveitis, and veterinary personnel should be aware of the zoonotic potential of animals presenting with this eye condition.

Leptospirosis

Most significantly, uveitis is a well-documented sequela of leptospirosis in humans, dogs, and horses. Leptospirosis is now one of the most common zoonoses in the world.⁵ It is possible for dogs to develop uveitis from leptospirosis before developing other clinical signs.

Vaccines for leptospirosis are available; however, multiple serovars of leptospirosis can cause uveitis, and not all are currently included in vaccines. Dogs vaccinated for leptospirosis should still be tested for leptospirosis as part of their workup if they present with uveitis. It is important to note that it is possible for dogs to become infected with leptospirosis and shed the virus without ever having a titer above 1:100.⁶

Leptospirosis bacteria are transmitted through contact with infected urine. It is not uncommon for affected dogs to carry urine on their fur; therefore, personnel who come in contact with a dog that is possibly infected with leptospirosis—or other

• TECHPOINT •

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zoonotic disease—should wear gloves and practice frequent handwashing. Recognition of uveitis and its potential causes is important for personal protection as well as for providing total patient care.

Brucellosis

Brucella canis is another cause of uveitis that can be transmitted to veterinary personnel. It is especially dangerous for women who are pregnant or may become pregnant, as it can cause spontaneous abortion.⁷ No vaccine for brucellosis currently exists, so all intact, breeding dogs with uveitis should be tested for this bacterial infection.

TREATMENT

The immediate goals of uveitis treatment involve stabilizing the blood-eye barrier, providing comfort, maintaining vision, and minimizing inflammation. Treatment depends on the underlying cause of uveitis; for example, systemic antibiotic or antifungal medications may be prescribed.

It is possible to resolve uveitis and eventually discontinue medication after the underlying cause is addressed. Unfortunately, many cases do not have an underlying cause that can be diagnosed or cured, such as with idiopathic or immune-mediated uveitis.³ These dogs often require long-term topical and/or oral medical treatment that is tapered down to the lowest effective dose.

Treatment options consist of topical nonsteroidal anti-inflammatory drugs (NSAIDs) or corticosteroids, as well as mydriatic agents. The most common topical NSAIDs include flurbiprofen sodium, diclofenac sodium, and ketorolac tromethamine. The topical corticosteroids dexamethasone and prednisolone acetate are used because they can penetrate the cornea into the anterior chamber of the eye. Hydrocortisone does not efficiently penetrate the cornea; therefore, it does not achieve a therapeutic level in the aqueous humor.¹

Systemic NSAIDs or corticosteroids may be used if topical medications cannot successfully control the uveitis. Systemic corticosteroids should be used cautiously because they may exacerbate infectious causes of uveitis.

In some immune-mediated cases, if systemic and topical NSAIDs and corticosteroids fail, an immunosuppressive drug such as azathioprine or mycophenolate may be used to control uveitis. However, the CBC should be carefully monitored to check for a decrease in white blood cells, red blood cells, and platelets.²

Topical atropine ointment or solution is the most commonly used mydriatic (causes pupil dilation) and cycloplegic (causes paralysis of the ciliary muscles of the eye). Atropine relaxes the pupillary muscles, which relieves ciliary spasm, provides comfort, stabilizes the blood-eye barrier, and reduces infiltration of inflammatory cells into the eye. Mydriatic medications should be used with caution, as they can exacerbate glaucoma.

THE ROLE OF THE VETERINARY TECHNICIAN

Uncontrolled uveitis can be devastating to the eyes and wellbeing of the canine patient. Often, veterinary technicians are responsible for assistance in diagnosis (BOX 2) and care of dogs with uveitis.

Veterinary technicians are often the educators and comforters of clients whose dogs have been diagnosed with this condition. Client education about uveitis can be difficult because of the many causes and often extensive treatment. It is necessary for veterinary technicians to be aware of the potential

effects of uncontrolled uveitis and able to accurately and confidently relay that information to clients.

CONCLUSION

Canine uveitis is often a subtle and frustrating disease. Diagnosis of uveitis and consideration of potential causes are necessary to control uveitis. Treatment of the underlying cause may eliminate uveitis; however, medication is often required for long periods of time. Uncontrolled uveitis can lead to discomfort and blindness.

Clinic staff should be aware of the possible zoonotic risks and take the proper precautions to protect themselves. Client compliance is essential for treatment of uveitis, and it is often up to the veterinary technician to educate clients on the importance of medicating and controlling uveitis. When uveitis is controlled, it is possible to provide these dogs with comfort as well as preserve vision. ■

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BOX 2 Sample Questions for Clients When Their Dog Presents for Uveitis

- Any changes in appetite or weight?
- Any changes in overall energy levels?
- Any coughing, sneezing, or difficulty breathing?
- Any recent illnesses?
- Does your dog have any access to cat feces, either from a litterbox or outside?
- Does your dog have any known medical conditions?
- Has your dog been able to swim in or drink from any lakes or streams?
- Has your dog eaten any raw meat?
- Has your dog ever travelled outside of your region?
- Has your dog experienced any vomiting or diarrhea?
- Is your dog current on heartworm preventive medication?
- When was your dog last vaccinated?
- Which vaccines did your dog receive?

