



# Ten Tips to Improve Your Ophthalmology Skills

Kenneth Abrams, DVM, Diplomate ACVO

**Ophthalmology** is a discipline of clinical recognition.

**W**e do not do many blood tests, radiographs, higher imaging, or urinalyses to determine a diagnosis; rather, through a systematic clinical examination we can usually determine the patient's disease and subsequent treatment. Here are 10 tips to improve your ophthalmic examination skills.

## 1 The 60-Second Diagnosis

Before you place any drops in a patient's eye, you should perform a Schirmer's test—an easy-to-administer test with an extremely high diagnostic yield. In my practice, many patients have presented with a diagnosis of "chronic conjunctivitis" with mucus, only to be diagnosed with keratoconjunctivitis sicca (KCS) in 60 seconds (each eye) by a Schirmer's test.



**Figure 1.** Schirmer's test with template numbers and blue dye for easy test result evaluation

Purchase test strips that have the numbered template right on the strip and are impregnated with a blue dye that travels up the strip as the tears moisten it

(**Figure 1**). Normal tear production in the dog is > 15 mm/min.

## 2 The Pressure is On

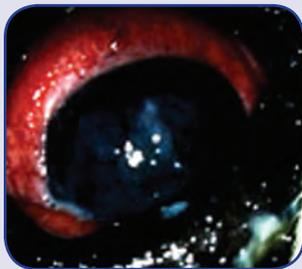
Have you purchased a Tono-Pen only to have it sit in its case because you aren't sure when or how to use it? Here are some easy and practical ways to get that Tono-Pen working for you.

First, remember the 4 Cs of the Tono-Pen: calibrate, cover, clean, and control.

- **Calibrate:** Make sure you calibrate the unit so it takes an accurate and fast reading; calibration should be performed with a cover/tip on the device.
- **Cover:** Always store the unit with a cover on it and use a new cover after the unit has been calibrated and cleaned. The cover is pulled taught so it is not loose and baggy around the metal end.
- **Clean:** Clean the unit by blowing a stream of canned air in the side ports of the metal end. This cleaning will blow out any powder that's accumulated from the rubber cover.
- **Control:** Here is the crucial part of the procedure—be sure you have a minimal amount of patient restraint, both around the neck and eyelids. The assistant should keep the patient relaxed as you gently open the eyelids without putting pressure on the globe. It's extremely easy to make the reading too high by forcefully restraining the patient. If you are suspicious that there was excessive eyelid pressure or patient restraint, retest the patient.

The principles of minimal restraint and testing both eyes (to compare the problem eye to the contralateral eye) applies to finding both elevated (glaucoma) and decreased (uveitis) pressure values.<sup>2</sup>

### Treating...Keratoconjunctivitis Sicca



**Figure 2.** KCS with complete corneal pigmentation

KCS is treated with a lacrimomimetic topical drug, such as cyclosporine or tacrolimus, that helps improve tear production and reduce corneal scar tissue (**Figure 2**).<sup>1</sup> These drugs are compounded in various concentrations in both liquid and ointment formulations.

### 3 Don't Skip the Fundus

Examination of the fundus allows us to directly evaluate the patient's blood vessels, nerves (optic nerve and retina), and clarity of the ocular medium (vitreous).

- **Dilation:** Examination of the posterior segment is easiest when the pupils are dilated. Dilation is best achieved with tropicamide 1%, either alone or in combination with phenylephrine 2.5%. Avoid use of atropine due to the fact that its effect lasts several days to a couple of weeks. Tropicamide, on the other hand, lasts only 4 to 6 hours.
- **Instrumentation:** Using a direct ophthalmoscope provides high magnification, but it's



**Figure 3.** Indirect ophthalmoscopy performed with a penlight and 28 diopter condensing lens

analogous to looking at a cytology slide with 100× magnification as the first lens. Rather, either use indirect ophthalmoscopy (Figure 3) or the PanOptic

scope (welchallyn.com) to give you less magnification and a wider field of view of the fundus.

Three common clinical findings of the fundus are retinal:

- Degeneration
- Hemorrhages
- Detachment.

Often times a dog is referred for cataract evaluation when the real reason the patient is losing vision is due to inherited retinal atrophy. In these patients, the cataracts are secondary and, therefore, cataract removal will not improve vision as the retina will degenerate, eventually causing blindness. Signs of retinal atrophy include tapetal hyperreflectivity and vascular attenuation or absence.

Another common clinical presentation is an aged cat with sudden vision loss; evaluation of this patient's fundus may reveal multifocal retinal and vitreal hemorrhages as well as retinal detachment. These findings indicate that the patient's blood pressure should be evaluated for possible systemic hypertension.

### 4 Uveitis—How Do We Know?

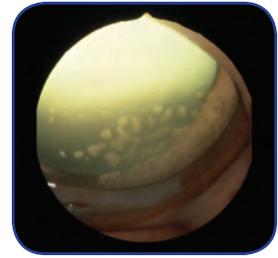
Practitioners are often confused about the term *uveitis*.<sup>3</sup> Uveitis results when the iris and ciliary body blood vessels are inflamed and allow leakage of vessel contents, including cells, protein and, sometimes, fat (ie, diabetic uveitis). Other than non-specific findings, such as redness and cloudy eyes, there are 3 basic signs that identify possible uveitis:

- Decreased intraocular pressure
- Aqueous flare and cells
- Presence of keratic precipitates (Figure 4), especially in cats.

**Aqueous flare** is simply protein that has escaped from leaky vessels; if the vessel holes are large enough, cells or even whole blood can enter the anterior chamber.

Flare and cells can be found with a slit beam of light from a direct ophthalmoscope, PanOptic ophthalmoscope with a slit beam feature, inexpensive slit beam devices, or a hand-held slit lamp biomicroscope. The light beam within the anterior chamber will look cloudy if there is protein, cells, or both. Magnification helps locate cells floating in the aqueous humor; however, if you see cloudiness in the aqueous humor, it's protein and/or cells.

**Keratic precipitates** are cells that precipitate on the corneal endothelium. They are most often found inferiorly and in cats.



**Figure 4.** Keratic precipitates located inferiorly in eye with anterior uveitis

### 5 Young Dog, Squinty Eye

A young dog (usually about 2 years old) presents with a very squinty eye. Often times it's a golden retriever, bulldog, shih tzu, Lhasa apso, or bichon frise. You examine the eye and think you see a superficial erosion toward the superocentral aspect of the cornea. However, the squinting is making it difficult to tell for sure. One hint to help a patient relax for a more thorough examination is to apply a couple of spaced drops of proparacaine.

If you don't see anything obvious causing the pain and erosion, such as a foreign body or entropion, consider an ectopic cilium. To clarify, this is not distichia—extra eyelashes along the lid margin.<sup>4</sup> While many of these patients will have distichiasis, an ectopic cilium is a single hair protruding from the underside of the eyelid through the conjunctiva.

#### Treating...Ectopic Cilium

Treatment of ectopic cilium requires, under general anesthesia, removing the hair follicle en bloc and freezing the residual tissue.

- Stabilize the eyelid with a chalazion clamp so the abnormal area is easier to see and handle.
- With a 2-mm skin punch, do a partial thickness punch around the follicle and use a small blade to remove the tissue.
- Use a cryonit to freeze–thaw–freeze the area and a small cautery to control any oozing.
- The patient will feel better immediately.



**Figure 5.** Ectopic cilium in typical location of central upper eyelid

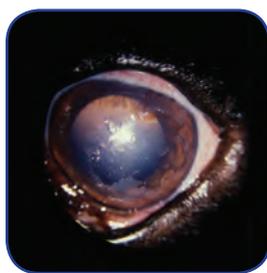
In almost all cases, the hair is in the center of the upper lid (**Figure 5**).

To find the hair, flip the upper lid and, with good magnification, locate the hair protruding from the conjunctiva. The hair is often surrounded by pigment, making it easier to spot; however, putting a drop

of phenylephrine 2.5%, which blanches the redness often associated with the condition, allows the hair to be seen more clearly.

## 6 Is the Corneal Ulcer Superficial or Deep?

Proper treatment for a corneal ulcer is very dependent on whether the ulcer is superficial or deep. How do we differentiate between the 2 of them?



**Figure 6.** Superficial corneal erosion with ragged epithelial edges

- **Magnification:** Examine the cornea with magnification to determine how much tissue is missing. If the ulcer has a ‘ragged edge’ (similar to how an onion with the skin peeled off looks), then it’s superficial (**Figure 6**); if the ulcer has a ‘crater’ look with sloping edges, it is missing stroma and rather deep (**Figure 7**).

- **Fluorescein stain:** Fluorescein stain works by turning stromal tissue green—the epithelium has to be disrupted for the stain to infiltrate

the stroma. Once an ulcer has the last layer of cornea bulging through the stroma (ie, a descemetocele), fluorescein stain often can-



**Figure 7.** Melting corneal ulcer with sloping stromal sides

### Treating...Corneal Ulcers

Treatment greatly depends on the type of ulcer:

- A simple superficial or slowly healing indolent ulcer is treated by encouraging the epithelium to adhere to the underlying stroma. Techniques, such as epithelial debridement, bandage contact lenses, grid keratotomy, and some newer trial medications (ie, Adequan) are used to speed healing.
- Deep ulcers are much more critical and can result in rapid perforation of the globe, requiring enucleation. Depending on lesion depth, particular skills of the clinician, and a host of other factors, treatment ranges from medical support with anticollagenase drugs, such as acetylcysteine or serum, to conjunctival grafts.

not be retained by the cornea because all/most of the stroma is missing.

- **Determining Depth:** If you have a piece of examination equipment with a slit-beam, the degree that the light beam bends helps facilitate determination of ulcer depth.

## 7 Entropion Diagnosis: The “Cookie” Test

Patients can present with extremely squinty lids for a number of reasons: one of those is entropion. Suspicions are high when the patient is a shar-pei or chow chow, but what about other breeds that can have entropion, such as rottweilers, retrievers, and various giant breeds? Most of these patients are young (around 2 years old) and one lower lid is affected.

Many of these dogs are hard to examine and hold still. One very easy way to evaluate a difficult patient is to apply a couple of drops of topical proparacaine, which allows the patient to relax the lids; then have it sit for a treat (aka “cookie”). Most of these patients will sit at attention once you say the word “cookie”!

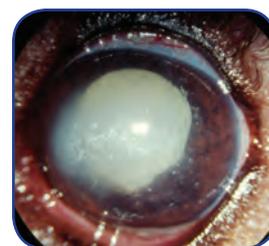
While the patient is sitting still without being held, keep the treat in your closed hand by your chin and look at the patient straight on, comparing each eye’s lid margins. If true anatomical entropion is present, the lid (usually the lower) is rolled in on the eye (**Figure 8**).



**Figure 8.** Lower eyelid entropion; the eyelid margin is turned inward and, therefore, not visible

## 8 Refer a Patient with a Unilateral or Early Cataract

Since the development of safer cataract surgery, it is best to have a patient referred for cataract evaluation sooner rather than later (eg, unilateral cataract patient or soon after a diabetic or pure-breed patient starts developing bilateral cataracts). This reduces the risk that a patient will develop lens-induced uveitis if the cataract remains in the eye. If severe adhesions develop between the iris and lens



**Figure 9.** Cataract-induced uveitis with associated posterior synechiae and corneal degeneration

(**Figure 9**) or secondary glaucoma or retinal detachment occur, it is too late to save the eye.

Many clients choose early evaluation by an ophthalmologist to prevent or treat lens-induced uveitis and will consider unilateral cataract surgery. There are a number of factors that affect the best timing for surgery; early referral allows the owner to become fully educated before severe complications occur.

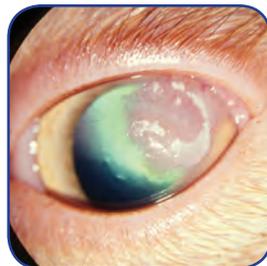
*It is crucial to perform clinical examinations in an orderly manner so as not to skip any steps that would help determine a diagnosis.*

if you can watch a day of appointments. I commonly have veterinarians visit my practice and see appointments side-by-side with me.

Remember, a thorough, systematic examination backed by clinical experience will help determine the diagnosis and treatment in many patients. ■

## 9 Cat Corneas Can be Confusing

Cats with conjunctivitis and corneal disease present a diagnostic enigma to both general practitioners and ophthalmologists. However, there is one disease that is easily recognized—eosinophilic keratitis (EK). EK is an immune-mediated disease often seen in young to middle-aged cats of all breeds. It may be triggered by herpesvirus, but treatment requires anti-inflammatory medications (ie, topical steroids).<sup>5</sup>



**Figure 10.** EK with typical appearance of gritty, granular, and vascularized inflammation

A clinician may suspect a corneal ulcer since the lesion typically takes up fluorescein stain. However, when you see a granulation-type, gritty, and vascular reaction on the cornea (**Figure 10**), it is often EK.

### Treating...Eosinophilic Keratitis

Despite some superficial stain uptake, EK requires use of topical steroids (prednisolone or dexamethasone). In most cases, cats with EK will respond immediately and dramatically to steroids and the drug is gradually withdrawn over several weeks to a few months as the cornea essentially returns to normal with minimal scarring. EK may recur a year or more after treatment.

## 10 “Look Ma...No Fancy Tests”

I've saved the 10th tip for last because it is the most important point of the article. As I mentioned in the introduction, ophthalmology is a discipline of clinical recognition. How do you gain clinical experience? One easy way is to simply call your local veterinary ophthalmologist and see

EK = eosinophilic keratitis;

KCS = keratoconjunctivitis sicca

### References

1. Salisbury MA, Kaswan RL, Ward DA, et al. Topical application of cyclosporine in the management of keratoconjunctivitis sicca. *JAAHA* 1990; 26:269-274.
2. Gelatt KN, MacKay EO. Distribution of intraocular pressure in dogs. *Vet Ophthalmol* 1998; 1(2-3):109-114.
3. Gwin, RM. Anterior uveitis: Diagnosis and treatment. *Seminars Vet Med Surg* 1988; 3(1):33-39.
4. Goodwin C. Canine cilia disorders. *Vet Tech* 1998; 19(2):115-125.
5. Paulsen ME, Lavach JD, Severin GA, Eichenbaum JD. Feline eosinophilic keratitis: A review of 15 clinical cases. *JAAHA* 1987; 23:63-69.

**Kenneth Abrams, DVM, Diplomate ACVO,** is the president and founder of *Veterinary Ophthalmology Services, Inc,* in Warwick, Rhode Island. He is also the past president of the American College of Veterinary Ophthalmologists. His special interests include intraocular surgery, retinal diseases, and glaucoma. Dr.



Abrams received his DVM from Oklahoma State University and completed an internship in small animal medicine and surgery at Angell Memorial Animal Hospital in Boston, Massachusetts, and a residency in comparative ophthalmology at University of Tennessee College of Veterinary Medicine. Prior to founding his current practice, he was a staff ophthalmologist at Tufts University Cummings School of Veterinary Medicine and Angell Memorial Animal Hospital.