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Your Cat's Eyes

The eye has been called the window to the soul. For cat owners and veterinarians, however, the eye is often a window to the rest of the cat as well. Cats are fortunate to have relatively few primary eye disorders, however, they often experience eye problems associated with other systemic illnesses, such as viral and fungal infections, and high blood pressure.

In humans as well as animals, the role of the visual system is to collect light and focuses it onto the retina, where specialized cells convert this light energy into nerve impulses. The amount of light that passes through the cornea is controlled by the pupil. Similar to the aperture of a camera, the pupil adjusts to different light levels by dilating to let in more light during dim conditions, or by constricting to limit the amount of light in bright conditions. When light strikes the retina, light-sensitive cells called photoreceptors are stimulated, causing them to produce impulses that travel to the brain.

As nocturnal creatures, cats are more sensitive to light than humans. While they can't see in total darkness, cats require only one-sixth the amount of light as that of a person to see. Their pupils can dilate three times larger than a human's, and the cornea is bigger, allowing more light in. The feline retina also contains reflective cells that amplify the light coming into the eye. These reflective cells (the "tapetum") are responsible for the "glowing appearance of the eyes when light strikes them.

Eyesight in cats is geared to assist in hunting. Being predators, their eyes are placed on the front of their head. This results in a larger area of binocular vision, allowing for more accurate depth perception and coordination of body movements with visual events. Cats, however, cannot see detail very well.

Visual acuity is the ability to see the detail of an object separately and clearly. A person with "20/20" vision can discern the details of an image (such as letters on a chart) perfectly from 20 feet away. Applied to animals, dogs are said to have a visual acuity of 20/75. The average cat is believed to have a visual acuity between 20/100 and 20/200. Simply put, cats are nearsighted.

Cats can see color, but they do not have as many color-sensitive photoreceptors as humans. Colors that would appear to be very rich to us are more pastel-like to the cat. Cats respond to the blue and yellow wavelengths best, but have trouble with green and red. What appears to us as "red" is simply "dark" to cats. A fraction of the green spectrum in cats is indistinguishable from white. Cats would see a green, grassy lawn as a whitish lawn, and a green rosebush with red roses would appear as a whitish bush with dark flowers. Cats, however, are very good at distinguishing many different shades of gray.

Changes in the appearance of cats' eyes are usually apparent to cat owners. If left untreated, many eye conditions can lead to visual impairment or even blindness, so any abnormality should be reported to a veterinarian. A thorough history is important before any eye exam. For example, outdoor cats are more likely to be exposed to trauma or foreign bodies than indoor cats. The general medical history is also very important, because many systemic diseases can manifest through the eye. Once at the veterinarian, the eyes can be examined in a systematic fashion. Ideally, the eye exam takes place in a quiet area to minimize excessive eye movement. The lights should be dimmed to eliminate distracting reflections from the surface of the eye. A bright, focused light source is necessary for a proper eye exam

Disorders of the conjunctiva are the most common eye conditions affecting cats. The conjunctiva is the membrane that lines the lids and covers the eyeball. Inflammation of this structure is called conjunctivitis and is often a symptom of a viral infection, especially the upper respiratory viruses (herpes and calici), or agents such as chlamydia (Picture: severe bilat conjunc.jpg). Herpes conjunctivitis is usually bilateral, whereas chlamydia often begins in one eye and progresses to bilateral involvement in about a week. Kittens are particularly susceptible. Dr. Anne Sinclair is the owner of Cat Sense, a feline-exclusive veterinary hospital in Bel Air, Maryland. "I encounter a lot of conjunctivitis, especially in orphaned kittens", notes Dr. Sinclair. "Fortunately, most recover with no problems, although I've had a few kittens lose sight in one eye from severe herpes infections".

The "third eyelid" is a membrane located in the inside corner of the eye. It produces a portion of the tear film, helps distribute this tear film over the surface of the cornea, and protects the cornea from damage. Elevation of the third eyelid on one side only is often a sign of local irritation or trauma to that eye. General malaise from a variety of well-defined or vague systemic illnesses can cause bilateral elevation of the third eyelid (often described by cat owners as a "film over the eyes"). Whenever this symptom appears, a thorough ocular and systemic examination is warranted. Therapy is directed at the basic illness, as elevated third eyelids do not interfere with vision.

Corneal diseases, most notably corneal abrasions or ulcers, are common in the cat. Superficial ulcers can occur as a result of trauma, such as a fight with another cat, or as a result of herpes virus infection. Regardless of the cause, ulcers must be treated promptly. The feline cornea is only 0.5 millimeters thick. Delaying therapy for corneal ulcers could result in rupture, leading to blindness. Special fluorescent staining techniques can readily identify corneal ulcers. Treatment generally involves topical antibiotics. Herpes ulcerations require antiviral drugs. Occasionally, topical analgesics are necessary, as corneal ulcers can be quite painful. Dr. Eric Bregman treats many corneal ulcers at his feline-exclusive veterinary hospital in Williston Park, New York. "This is a suburban practice, and many of our clients let their cats go outdoors", he says. "Cat fights probably account for the majority of the corneal ulcers I see in these outdoor cats. Fortunately, most cases end favorably, although I've seen a few eyes rupture after the ulcer became infected and the cat wasn't brought here quickly enough".

Cataracts (opacities of the lens) are relatively uncommon in the cat. Unlike dogs, cats with diabetes do not develop cataracts. Congenital cataracts are occasionally seen in kittens, but they tend to be non-progressive and improvement in vision may

eventually result. Inherited congenital cataracts usually occur in Persian cats or breeds with Persian ancestry.

As with any organ, cancer can occasionally strike the eye. Ocular cancer can be categorized as primary (originating from the eye) or secondary (originating from nearby structures or distant structures). Recently, my own 16-year old blind cat, Ethel, developed an inflammatory condition of her left eye that got progressively worse and didn't respond to anti-inflammatory medication. I eventually had to remove the eye surgically. The pathology report confirmed the eye to be cancerous. Unfortunately, the cancer had spread to nearby lymph nodes. This type of cancer (lymphosarcoma) often responds to chemotherapy, however, I've elected not to go this route due to her other medical problems. Fortunately, my Ethel seems to be made of steel. She is doing remarkably well despite her unfavorable biopsy report.

The eyes are important and delicate organs. Any minor eye problem that doesn't clear up quickly (within 24 hours) should be brought to the attention of a veterinarian.

Administering eye medication

Therapy for most eye disorders entails administering drops or ointments. Drops are often easier to administer, although many drops require frequent administration. Ointments have the advantage of providing lubrication and allowing for increased contact time for the medication, and are especially useful given at bedtime. Application involves using the thumb or forefinger to gently roll the lower eyelid downward. Ointment is then squeezed into the exposed space (called the "conjunctival sac"), and the eye is opened and closed by hand several times to evenly distribute the ointment over the eye. Approaching the eye from the outside corner can prevent the cat from seeing the tip of the tube, making administration a bit easier. Eye drops are instilled with the cat's nose tilted slightly upward. To prevent contamination, the tip of the dropper bottle or ointment tube should not be touched by fingers or any other surface, and should not come into direct contact with the eye.