

Vision problems in cats: how can I tell if my cat has this problem?

Vision in cats:

Cats rely on their vision to perform several tasks such as navigation, hunting, orientation, avoiding undesirable situations, interaction with other cats and watching the world go by. In order to see an image, several factors are combined including:

- Detection of light and movement
- Visual perspective (the angle through which the cat views the world, usually from close to the ground)
- Field of view (the extent of the view which is visible)
- Depth perception (the ability to judge distances)
- Visual acuity (the ability to focus)
- Perception of colour and shape.

The brain receives this information from the eye and forms an image accordingly. The brain also receives several other pieces of information about sounds, smells, texture and taste. All of this is combined to complete the vision and perception experience.

Cats have evolved to be excellent night-time hunters. Vision in a normal cat is very good but in order to gain advantages that particularly help with night vision and hunting, some trade-offs mean that cats do not see in as fine detail as we do. The main reason that cats have better night (nocturnal) vision than us is because they have an extra layer in the back of their eye called a tapetum. This is a reflective layer which lies underneath the retina – the 'seeing' part of the eye. The retina contains special cells called rods and cones which absorb light converting this into information which is processed by the brain. Light which enters the eye and is not absorbed by the rods and cones contacts the tapetum and is reflected back to the rods and cones again. In other words, the cells of the feline retina get a second chance to absorb the light. The tapetum is responsible for the mirror-like reflection which we see from cats when we catch them at night with a bright light, such as with the head-lights of a car. It is suggested that cats' nocturnal vision is six times better than ours. Another factor which improves their nocturnal vision is the fact that they can dilate their pupils so widely, maximising the amount of light which enters the eye in dim lighting.



This pupil is constricted (in this case because of bright sunlight) which means that more of the coloured iris is visible and the pupil is a narrow slit.



This is a dilated pupil. The coloured iris is only visible at the periphery and there is a large central dark (can appear black) area.

The urban myth that cats can only see in black and white is not true. They do not see the variety of colours which we can see, but they have been found to have some degree of useful colour vision. Blue is seen well, but the colours red, green and yellow all appear relatively similar.

How can you tell if your cat's vision is poor?

Believe it or not, determining how much your cat can see can be quite difficult. Behaviour can change, for example your cat may appear hesitant when walking or may bump into objects. However, in most cases where vision has been lost gradually, no behaviour changes are seen. This is since the cat has adapted to their gradual disability, learning where furniture and other obstacles in the home are. Sudden vision loss is easier to notice as the behaviour changes are more obvious to you. Unusual behaviour may lead you to a suspicion that the eyesight is poor. Bumping into objects is an obvious result of poor vision, but actually may only be noticed when furniture is moved or when items such as shopping bags are placed down temporarily. This is because cats possess a tremendous ability to adapt to the situation, and will retain an awareness of the normal layout of their familiar environment, only getting caught out when it is changed.

You may notice a reluctance to jump down from a height. The cat may actually climb down by gingerly reaching the feet down first. They are usually happier climbing up onto objects, but go about it in a more cautious and slower manner. They may walk in a crouched position with their body closer to the ground and stretch their necks out further, using their long whiskers to feel their way. Cats with vision problems actually seem to grow longer whiskers!



This cat has poor vision, and is apprehensive in movements in a strange environment. He is crouching low to the ground. Photograph courtesy of Sarah Caney.

In some cats with vision problems, you may notice a change in the appearance of their eyes. They may be more cloudy, more red or have a different reflection than before. Cloudy eyes can be caused by cataracts, which is an opacity of the lens. It could also be caused by glaucoma, a raised pressure inside the eye, or uveitis which is the medical name for inflammation inside the eye. Eyes may be red due to high blood pressure causing bleeding inside the eye, or due to glaucoma, uveitis or a tumour in the eye. With some conditions affecting the retina such as retinal detachment secondary to high blood pressure, the absence or thinness of the retina allows even more light to be reflected back from the tapetum. In this case, the glow from the back of the eye appears more intense.



Cataracts in both eyes – the eyes appear more grey as the lens is cloudy

If you have noticed a recent colour change in one or both of your cat's eyes, it is highly recommended that you take them to your vet to have an eye examination. In many cases, your vet will be able to tell you what is wrong and can therefore advise on the best treatment. In some circumstances, your vet may recommend that you are referred to a specialist in veterinary ophthalmology. The ophthalmologist is better equipped to be able to diagnose certain conditions, and will be able to offer treatment advice and specialised procedures. Some conditions will be managed with eye drops or oral medications, and all conditions are more successfully treated when diagnosed early on in the course of the disease.

How can I test my cats vision?

This can be tricky, even for your vet! There are several tests which a vet will perform, some of which can be tried by an owner at home.

1. The menace response test: This involves threatening to contact your cats eye with a hand. The eye is not actually touched but gentle hand movements towards the eyes are used to trigger a 'menace response'. A normal cat will blink when they see a hand approaching them. It is important not to create an air current by waving a hand on one side of the head, which of course a normal cat will sense and blink their eye as a reflex.
2. The dazzle reflex: This involves shining a bright focused light suddenly into the eye. A normal cat would blink, squint or turn their head away, but a blind cat cannot see it and continues to stare ahead.
3. The tracking response test: This involves dropping small pieces of cotton wool, from a height, near your cat. A cat with normal vision can't resist watching them fall. The reason cotton wool is chosen is because it doesn't make a noise as it passes through the air. Noisy objects falling can be followed using the sense of hearing on its own.

4. The pupillary light response (PLR): This is a test in which the pupil normally constricts (gets smaller, narrowing to a slit) when a light is directed into the eye. However, in some circumstances, the pupil of a blind eye will still constrict normally in response to the light. Similarly, the pupil of a sighted eye may not constrict because of a variety of other conditions. Therefore an abnormal response should not make you question your cat's vision, but should prompt you to take him or her to the vet for an eye examination.



Veterinary ophthalmologist testing the PLRs of a cat, with the help of a veterinary nurse.

5. Closely observe your cat's behaviour, as mentioned earlier. You may notice the vision change is more noticeable in dim or bright light, which will give your vet more of an idea as to the cause.

How can I care for my blind cat?

Cats with visual impairments function very well in familiar surroundings, so much so that it may be a surprise for you to learn that your cat has any vision problems at all. Cats face many challenges in order to adapt to life without vision, but do so without our knowledge in many instances.

Cats do not feel sorry for themselves because their vision is poor, but they get on with things. Some causes of blindness - for example high blood pressure - require specific treatment which your vet will prescribe. There are lots of simple but effective ways in which the home and garden can be adapted to support a visually impaired cat. A detailed technical guide which covers all of the topics discussed in this article in much greater detail was published in August 2008. 'Caring for a blind cat' by Natasha Mitchell is available as an electronic (e-book) or printed softback via www.catprofessional.com. E-books cost £7.00 and printed books £9.99 + postage.