

Fundus examination: equipment and techniques

Fundus examination can be extremely helpful in identifying patients with systemic hypertension and other diseases.

The author's approach to fundus examination involves examining the patient in a dark room (no windows or black-out blinds). If the room cannot be adequately darkened then it may be necessary to dilate the pupils using one drop of 0.5% tropicamide to facilitate thorough examination. Tropicamide is effective for 4-12 hours.

Distant indirect ophthalmoscopy

Once familiar with this technique it usually takes less than a minute to perform. Mydriatic eye drops are not needed as long as the room can be made dark. The advantages of this technique over direct ophthalmoscopy are

- Since the light source is far away from the cat's eye the pupil does not constrict
- A large area of the fundus can be seen in one view – note that the image is inverted (upside down)
- The technique is very well tolerated by the cat – much more comfortable than direct ophthalmoscopy. There is less of a risk of you being bitten or scratched, if examining a tricky cat, since your head is eighteen inches away from the cat's face
- This is a great way of getting a 'global' view of the back of the eye very quickly – even non-ophthalmologists can quickly see whether the eye looks normal or not

Equipment needed for this technique

- Light source: this can be a Finhoff transilluminator, a pen torch or your direct ophthalmoscope set to a small circle
- Hand lens: a 20-30 dioptre condensing lens is suitable for this purpose. Inexpensive Perspex lenses are available Veterinary Speciality Products who sell a 20-30 dioptre hand lens for around £42. Ophthalmologists may prefer a specialist lens eg Volk, PanRetinal (contact information and Veterinary Speciality Products prices are at the end of these notes)

Technique

- The cat should be minimally restrained with their head in a neutral position or chin slightly tilted up
- Hold the light source by your eye and the lens just in front of the cat's eye (I rest my middle finger on the cat's head, holding the lens between my thumb and forefinger. The arm of the hand holding the lens should be straight – ie you are an arms distance away from the cat. You then tilt the lens and move your head (and hence light) until you see a good view of the fundus

- When learning this technique, start by using the distant light source to get a tapetal reflection (the bright reflection you get like with 'cat's eyes' on a road). Once the tapetal reflection is visible, insert the hand lens 2-4 cm in front of the cat's eye, perpendicular to the light beam
- Any lesions seen can be examined in a higher magnification using your direct ophthalmoscope
- A video showing this technique can be found in the Video Tutorial section of the author's website (look under Helpful info for Video Tutorials, the tutorial is called Indirect Ophthalmoscopy)

Direct ophthalmoscopy

A standard direct ophthalmoscope can be used to examine the fundus. An upright and magnified image is obtained. The ophthalmoscope should be held close to your eye and about 1-3 cm in front of the cat's eye. To examine the fundus, the zero dioptre setting should be chosen. The light setting should be reduced to a level which is tolerated by the cat. Lesions close to the optic disc can usually be easily visualised and the direct ophthalmoscope has the advantage of providing the most magnified images of the fundus. Lesions farther from the optic disc can be trickier to evaluate using a direct ophthalmoscope, especially if pupil constriction is restricting the field of view. If this is the case, the pupil may need to be dilated with mydriatic drops (eg 0.5% tropicamide). Tropicamide generally takes around 20 minutes to reach its full effect which lasts for 4-12 hours.

A guide to fundus abnormalities commonly seen in cats suffering from systemic hypertension is available in the Free Downloads section of the author's website.

Veterinary Speciality Products

(for inexpensive hand lenses and other ophthalmic equipment), information correct May 2017:

Economy 20D lens: £41.67

Volk Pan Retinal Lens: £186.88

Finhoff Transilluminator (several brands available e.g. Heine Welch Allyn and Keeler) and these vary in price. e.g. the Heine is £62.42 for a head only

Panoptic: £847.73

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