

## The Use of B-scan Ultrasound in Ophthalmology

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Diagnostic imaging using ultrasound has been universally accepted as a safe, reliable, and informative modality. Ultrasound imaging provides information that cannot be otherwise obtained when light transmission into the eye is obstructed or when anatomy around the globe needs to be assessed. A quality, easy to use ultrasound system should be readily available for veterinary ophthalmologists to utilize in diagnosis and determining course of treatment. Also, all treatments and subsequent follow up visits can be recorded using ultrasound images or as “cine” movies with newer ultrasound systems.

As a review, the general indications for examination of the posterior segment using ultrasound imaging are summarized below.

The B-scan (B stands for brightness) ultrasound can be advantageous in cases where the view into the eye is obstructed. One classic indication for using ultrasound is vitreous hemorrhage. The examiner cannot view the fundus using an ophthalmoscope due to blood floating in the vitreous. Ultrasound is particularly helpful to assess retinal and posterior segment integrity since the ultrasound energy can penetrate the blood cells.



Similarly, a dense cataract can severely limit visualizing the posterior segment. In this case, confirming the retinal integrity and general posterior segment health can be easily assessed with ultrasound. The cataract can obstruct light transmission from the ophthalmoscope, however the ultrasound energy is not affected and does not distort the image. Therefore, in all dense cataract patients, an ultrasound examination should be routine prior to cataract extraction.

It is also useful when the eye is clear and the practitioner wants to evaluate the surrounding extra-ocular muscles and orbit that cannot be appreciated using ophthalmoscopy. An example of ultrasound imaging being useful in clear eyes is when the patient presents with bulging or proptosis-like conditions. With an ultrasound examination, the cause can be identified specifically (ie: masses around the globe, enlarged muscles). Additionally, tumorous masses in or around the globe can be imaged so that more helpful information is provided to the ophthalmologist in diagnosis and prognosis.

Finally, an ultrasound examination can provide critical information to eye trauma patients. The ultrasound can quickly provide images that give the doctor an understanding of the extent of damage and the anatomical structures that are involved. With new portable ultrasound technology available (see Figure), it is now easier to take the ultrasound to the patient in the field and conduct examinations that give a more complete view and information of the extent of trauma. The same benefit applies to finding foreign bodies in the eye or globe.