B-scan ultrasound plays an important role in the diagnosis and management of various intraocular disorders in both clear and opaque ocular media. Although B-scan has been considered a useful tool in ophthalmology for several decades, continual developments in ultrasound technology have enhanced the ability of practitioners to detect and differentiate an array of intraocular lesions.

The detection of posterior vitreous detachment (PVD) in opaque ocular media (e.g., vitreous hemorrhage) is a well-known indication for B-scan ultrasound. In recent years, however, there has been considerable interest in using B-scan to demonstrate PVD in clear ocular media, in part to assess the efficacy of intraocular drug delivery for the prevention and/or progression of certain disorders. The identification of PVD in clear media can be quite challenging due to the indiscrete nature of the acoustic interface produced by the posterior hyaloid. For this reason, reliable evaluation of clear vitreous requires the use of prescribed examination techniques and a high quality B-scan ultrasound system such as the Eye Cubed (formerly known as I3, Innovative Imaging) from Ellex (Ellex Medical Lasers Ltd., Adelaide, Australia).

**PVD FOR PREVENTING NEOVASCULARIZATION IN NPDR**

To date, there are no US Food and Drug Administration (FDA)-approved pharmaceutical treatments available to prevent the occurrence of tractional retinal detachment in the diabetic patient. Current research and investigations, however, may soon lead to the development of such a therapy. Two current clinical trials, the first utilizing sites in the United States and India (http://clinicaltrials.gov/ct2/show/NCT00664183), and the second in Mexico (http://clinicaltrials.gov/ct2/show/NCT00908778), are investigating the safety and efficacy of intravitreal carbamide (Vitreosolve; Vitreoretinal Technologies, Inc., Irvine, CA), in patients with nonproliferative diabetic retinopathy (NPDR). The primary goal of both studies is to help preserve vision by inducing PVD for the purpose of preventing the progression of diabetic retinopathy. The administered drug induces vitreosolve, and this can be detected using B-scan ultrasound.

---

**Figure 1. Total PVD with Weiss ring. Longitudinal B-scan echogram through the macula shows PVD extending from the periphery and passing over the optic nerve. The Weiss ring is represented by the two closely-spaced, bright dots within the plane of the PVD.**
NEW WEB SITE PROVIDES INSTRUCTION ON PERFORMING OPHTHALMIC ULTRASOUND

Ophthalmicedge.org focuses on real-time pattern recognition during diagnostic B-scan captures.

At the year’s Annual Meeting of the American Academy of Ophthalmology, Yale Fisher, MD, officially launched his new Web site, www.ophthalmicedge.org. Dr. Fisher created this educational resource because he saw a need for a forum to provide basic education on the process of obtaining a B-scan ultrasound for diagnostic purposes. In many ophthalmic clinics and offices, ophthalmic technicians are the individuals who are primarily responsible for performing ultrasounds. Although this makes sense in many cases, said Dr. Fisher in a recent interview with Retina Today, there are distinct advantages in having the physician know how to obtain a good B-scan. In some cases, he added, performing the scan can offer a physician insight that would not be available from just reading the final report. According to Dr. Fisher, advantages include:

• the ability to see what may not be included in a report;
• the real-time view of patterns seen during the scan; and
• in a surgical procedure, the ability to understand the relationship of planned instrument techniques to the tissue abnormalities being addressed.

“It’s similar to flying a plane with topographical instrumentation; better perspective enhances performance,” Dr. Fisher said.

Dr. Fisher has designed the Web site with lectures and a video library to outline his preferred techniques, which he has used for over 40 years, for performing a diagnostic ultrasound, focusing on real-time pattern recognition. According to the site, the information targets “technicians, ophthalmology residents, fellows, and attendings with little or no understanding of diagnostic ophthalmic ultrasound.”

The lectures currently posted on the Web site are:

• A Brief History of Ultrasound
• Basic Physical Principles of Ultrasound
• Basic Instrument Design
• How Does an A-scan Become a B-scan?
• Examination Techniques for the Beginner
• Concepts for Diagnosis – Real Time
• Concepts for Diagnosis – Gray Scale
• Concepts for Diagnosis – 3D

How to Approach a Diagnosis

Additionally, the topics of the many videos posted include ultrasound diagnostic techniques for vitreous, retina, choroid, ocular wall, axial length abnormalities, and orbit.

Dr. Fisher said that the Web site is still under construction (approximately 85% complete) and that he expects to have more information posted in the near future. Additionally, he hopes to include sections for global contributors to create an open exchange of ideas on diagnostic ultrasound and its many utilities in ophthalmology.

Please visit: www.ophthalmicedge.org for more information.

Yale L. Fisher, M.D. is a Clinical Professor of Ophthalmology at the New York Hospital Cornell Medical Center, a Voluntary Clinical Professor of Ophthalmology at Bascom Palmer Eye Institute in Miami, and Attending Surgeon at Manhattan Eye, Ear and Throat Hospital in New York. He practices at Vitreous-Retina-Macula consultants of New York and Bascom Palmer Eye Institute in Palm Beach Gardens, Fl. He can be reached via e-mail at yfisher42@aol.com.
Intravitreal carbamide is a pharmaceutical treatment for patients with nonproliferative diabetic retinopathy that is currently undergoing phase 2 and 3 clinical trials at sites in the United States, India, and Mexico.

When injected into the vitreous cavity, intravitreal carbamide may induce PVD to avoid the progression of vision loss by tractional retinal detachment from NPDR. Once the intravitreal carbamide is administered, the vitreous gel is liquefied and neovascularization is prevented.

As one of the fastest growing diseases, diabetes is a significant current problem with major ocular complications. At present, there is no FDA-approved pharmaceutical treatment for diabetic retinopathy that can prevent or reverse the progression of the disease. There are an estimated 8 million patients in the United States with diabetic retinopathy.

**STANDARDIZATION**

Standardization of the protocol across all sites in the intravitreal carbamide trial ensures uniform and accurate data acquisition. A primary benefit of the Eye Cubed is its ability to capture real-time data (movies) using its fast acquisition rate. The use of a standardized protocol, including a set of high-quality movies, allows the independent review of complete screening examinations of the posterior segment and an accurate assessment of the mobility of vitreous pathology. As a result, B-scan data for the study is nearly as good as being able to directly observe the real-time examination at the clinical sites.

In addition to a wide array of technical features, the Eye Cubed has demonstrated high reliability, and Ellex has provided time-tested quality customer service. Such considerations are important when selecting instrumentation to be used in a multicenter clinical trial, and they affected the decision to choose the Eye Cubed system for the intravitreal carbamide trials. Experience with the Eye Cubed in the intravitreal carbamide trials has been excellent as it has fulfilled the requirements of accuracy, stability, and reliability.

The ultrasound technology currently available in ophthalmology has enhanced our ability to diagnose, monitor, and subsequently manage vitreoretinal pathology. As technological advancements continue to emerge, further improvements in B-scan ultrasound technology can be expected.

Sandra Frazier Byrne has been a practitioner and educator in the field of ophthalmic ultrasound since 1971. She practices ophthalmic ultrasound and directs the Ultrasound Reading Center in Asheville, North Carolina. Ms. Byrne can be reached at sandy@suloinc.com.