

# Early Detection and Better Results for AMD

The Foresee PHP is an important tool for determining the conversion to neovascular AMD.

BY DIANA REEVES, MD

*How important is early detection of exudative age-related macular degeneration (AMD)?*

This question can be answered by examining data from 53 primary studies conducted between 1980 and 2005 on 4,362 untreated neovascular AMD patients (n=36% classic, 31% occult, 81% subfoveal). A compilation of the study results showed an average of one line of visual loss at 3 months, three lines at 12 months, and four lines at 24 months for these untreated patients. More importantly, severe visual loss (ie, >6 lines) occurred in 21% of the patients at 6

months and 42% of patients at 3 years.<sup>1</sup>

This proves, without any doubt, that the early detection of exudative AMD is vital in order to preserve vision by initiating prompt treatment (Figures 1 and 2).

## EARLY DETECTION

Early detection, however, has been a challenge for the general ophthalmic community. Patients with macular degeneration may suffer from a variety of other ocular conditions (eg, cataracts, dry eye, atrophic macular changes), which make a slight change in vision related to the development of neovascular disease, difficult to diag-

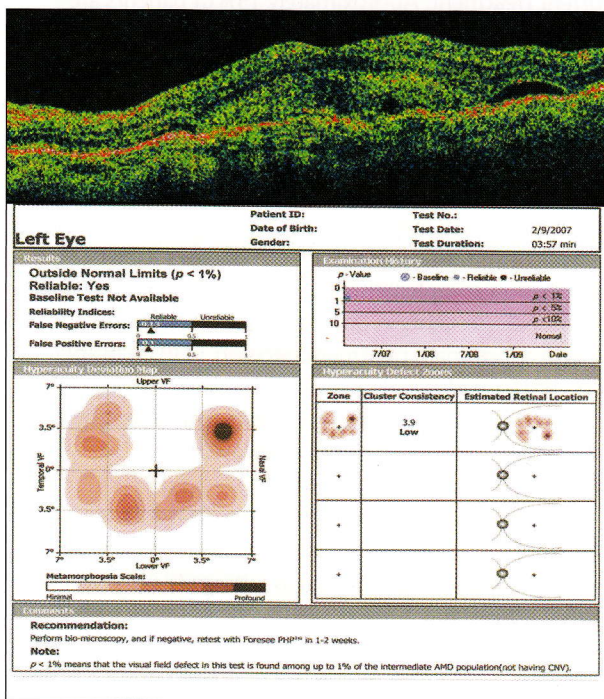


Figure 1. Preferential hyperacuity perimeter (PHP) and optical coherence tomography (OCT) correlate in identifying exudative AMD. PHP localizes the area of leakage within the macula.

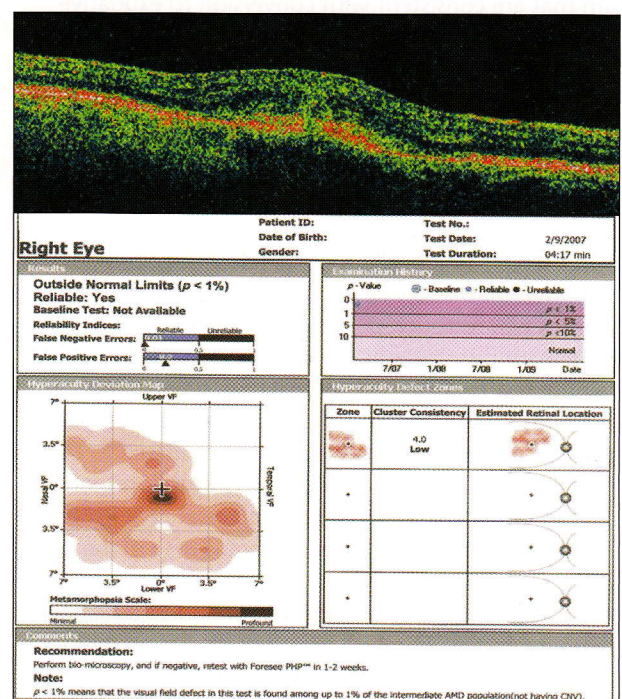


Figure 2. The PHP reading strongly suggests that the OCT shows a neovascular process.

nose. Additionally, patient self-monitoring using the Amsler grid is often inadequate because the brain typically compensates for retinal defects. In my experience, the transition to early exudative disease is not recognized soon enough in approximately 15% of patients.

In spite of these factors, recent advancements in drug treatments and diagnostic technology make the present an exciting time for the AMD community. One such technology showing exceptional promise is the Foresee PHP (preferential hyperacuity perimeter) (Notal Vision, Tel Aviv, Israel), a device designed for early diagnosis of choroidal neovascular membrane.<sup>2</sup> The Foresee PHP is the follow-up to the Preview PHP (Notal Vision), the only ophthalmic device to receive US Food and Drug Administration clearance for monitoring the progression of AMD. It allows eye care professionals to track a patient's visual field for changes characteristic of exudative disease. The device administers an easy-to-perform test, which identifies characteristic elevations in the retinal pigment epithelium that are consistent with conversion to exudative AMD.

The Foresee PHP's diagnostic capability is based on the phenomenon of hyperacuity, defined as the ability to perceive a minute difference in the relative spatial localization of two or more visual stimuli. The test maps defects within a patient's visual field by analyzing responses to dot deviation signals that flash on a computer screen. Practically, a signal (closely spaced dots) is displayed on the device's screen for 160 ms. Patients use a stylus pen to touch the screen to identify the most prominent distortion in the line. A typical 3- to 5-minute test measures 500 retinal data points covering the central 14° of the macular visual field. The response patterns are recorded, analyzed, and compared to the normative database, producing a report that reveals the relative location of defects in the macular area.

The PHP system builds a topographic map of the patient's vision to highlight all areas of concern in the macula. In that respect, it differs from optical coherence tomography (OCT), which gives a cross-section snapshot through the point of fixation. When multicentric disease is present, OCT will not pick up all of the areas that show exudation. On the other hand, the pattern of dye leakage on angiography can often be confusing. PHP will help delineate if there is more exudation in the overall lesion. A

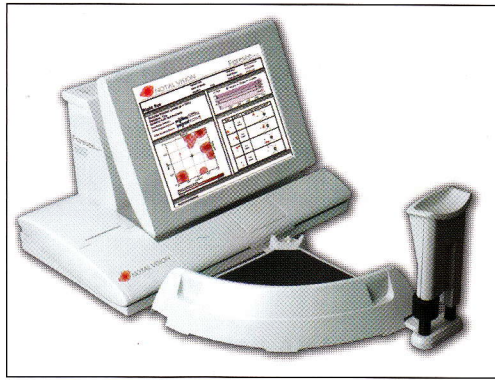


Figure 3. The Foresee PHP.

patient who has been receiving treatment can suspend treatments if all the areas of exudation are dry. PHP used in combination with OCT may also help to minimize the use of angiography during follow-up.

All AMD patients should have a baseline PHP. Then, depending on the absence or presence of high-risk features for neovascular disease, repeat testing may be performed anywhere from 2 to 4 times a year.

There are few false-positive results with PHP, but, like every other test, the information provided has to make sense in the clinical context. PHP offers a technique to diagnose neovascular AMD with about 85% sensitivity and 88% specificity.<sup>2</sup>

For patients who convert from nonneovascular to neovascular AMD, two key factors determine the outcome, (1) disease stage at diagnosis and (2) prompt treatment. Treatment results are contingent on timely diagnosis. Currently, from my experience, retinal specialists receive approximately 30% of AMD referrals too early; these patients have nonneovascular disease, for which there is no current treatment. Approximately 15% of patients are being referred too late; they have severe, irreversible vision loss for which treatment has minimal impact. Ideally, diagnosis and treatment should occur right after conversion to neovascular AMD, before vision loss has occurred.

PHP is an important tool in the comprehensive eye care doctor's office for determining the conversion to neovascular disease and helping to make the decision to ask for a retinal consult thus minimizing the doctor's liability. PHP information complements the existing retinal tests used by the retinal specialists in order to make a complex diagnostic and appropriate treatment decision. PHP is complementary to traditional OCT and fluorescein angiography to help guide decisions about retreatment, especially in patients with extensive macular disease. ■

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