Foresee PHP®

Preferential Hyperacuity Perimeter

See Wet AMD before your patients do.

Reichert™
TECHNOLOGIES
Advancing Eye Care. Preserving Sight.™

The **Foresee PHP®** Preferential Hyperacuity Perimeter provides an unsurpassed level of sensitivity and specificity in detecting recent onset Choroidal Neovascularization (CNV) and differentiating it from the intermediate (dry) state of AMD. The visual field analyzer monitors macular function by measuring relative photoreceptor field location and utilizing the phenomenon of hyperacuity, the ability to detect the misalignment of an object's location relative to the other objects in space.

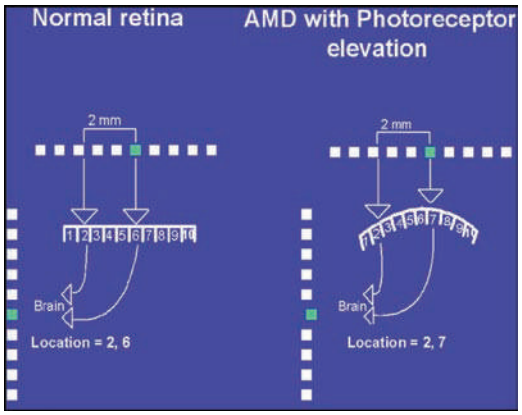
By combining patient interactive software with an innovative algorithm, PHP technology can identify small CNV lesions before visual symptoms are apparent to the patient. Early detection remains the vital precursor to preserving vision and maximizing treatment outcomes. The earlier the detection, the earlier the treatment, and better the visual outcome.

Foresee PHP® Technology

Foresee PHP Technology is based on the well-studied phenomenon of hyperacuity. Hyperacuity, also known as Vernier acuity, is the ability to detect misalignment of an object's location relative to other objects in space. This ability to detect misalignments is in the magnitude of 3-6 seconds of arc, which is 10 times better than the resolution ability in the fovea (around 30-60 seconds of arc). Hyperacuity is unaffected by a patient's age and is highly resistant to retinal image degradation, and is thus suitable for assessing retinal function in patients with cataracts as well.

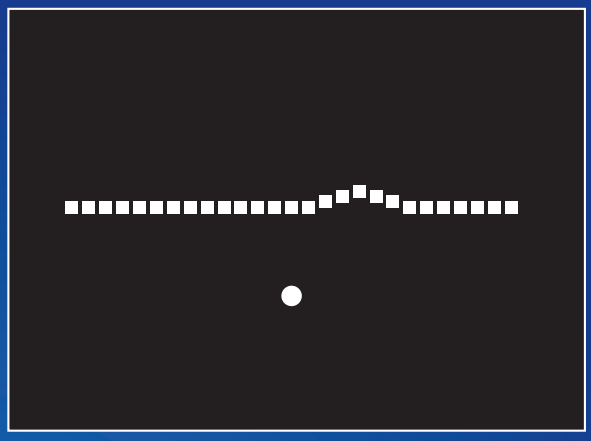
How the Foresee PHP Test Works

When a dot-deviation signal is projected on a healthy retina, it stimulates a collinear set of retinal receptive fields. Special neuronal circuits in the visual cortex process this information, leading to the perception of a straight dot-deviation signal. When retinal pigment epithelium (RPE) elevation occurs, both in the case of when drusen are present as in intermediate AMD, and often to a more significant degree when CNV develops, a geometric shift in photoreceptor location might occur. The photoreceptor fields stimulated during RPE elevation may be different than those stimulated on a normal retina. Therefore, linear signals may be perceived as distorted or misaligned.



During the examination, the patient is presented with a series of dot deviation signals *[Exam Figure 2]*. These dot deviation signals are composed of a collinear set of points (dots), and include one or more dots positioned at different locations (artificial distortions).

The patient is instructed *[Exam Figure 1]* to mark on the touch-screen any deviations they may see on the dotted line. Different magnitudes of artificial distortions are presented during the test, to compete with the patient's actual pathological distortion(s) caused by AMD and a rise in the RPE. If there is a pathological distortion present, and it is more pronounced than the presented artificial distortion, the patient will preferentially pick their own pathological distortion *[Exam Figure 3]*.



Dot-deviation with artificial distortion

Exam Figure 1

Exam Figure 2

Exam Figure 3

Immediate Test Results

The Foresee PHP records whether the patient noticed the artificial or pathological distortion, both distortions, or if the patient did not notice either distortion. During the test, the degree of the artificial distortions are varied to identify the magnitude and extent of the visual field defect.

Patient response patterns are recorded and compared to a normative database. Immediate test results are presented in a detailed report. The first page test report presents a Hyperacuity Deviation Map that identifies visual field defects (see below) and provides confidence and reliability parameters (false positive and false negative errors) for the test results. The confidence level indicates the likelihood that the test results are consistent with CNV or with intermediate AMD. A second page history report (not shown) gives enhanced features, such as tracking of hyperacuity deviation maps, p-values, total area, and total integrated intensity.

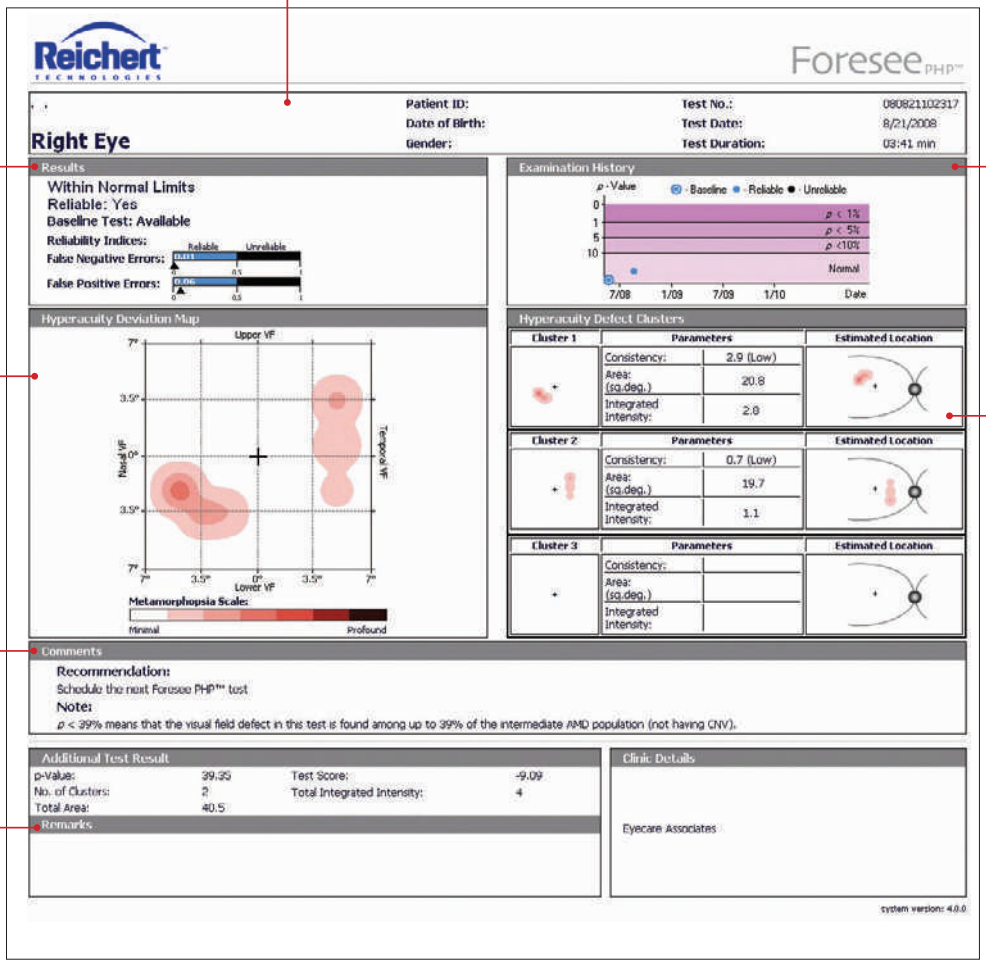
Patient Data
Displays general patient data and total test time.

Results
- *Reliability of the data based on false positive and false negative responses to stimuli.*
- *Represents the average deviation of the visual field compared to a normal reference.*

Hyperacuity Deviation Map
Identification of the location and severity of defects in vision due to defects in the retina.

Comments
Recommendations on the next steps in patient management, based on test results.

Remarks
Insert Doctor and Technician comments about the patient and test.

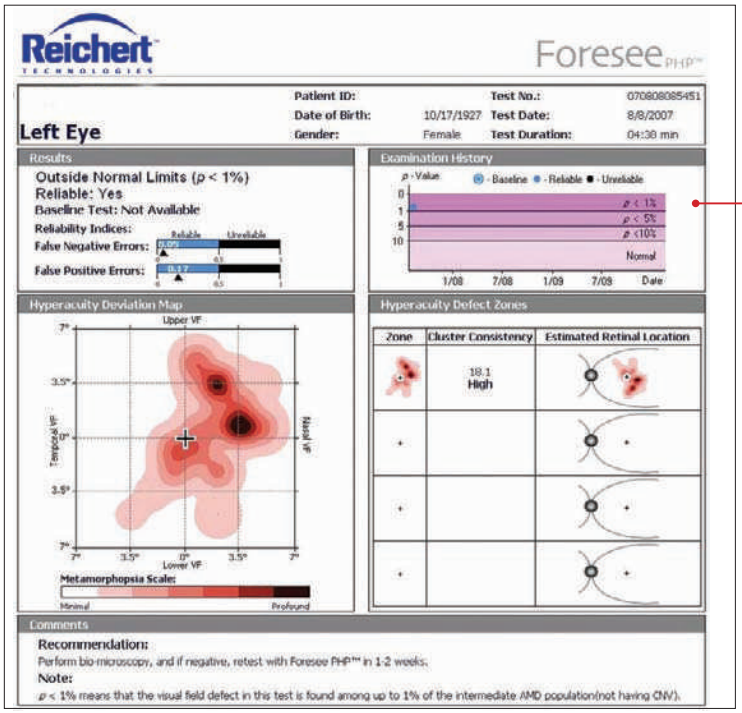


Examination History
- *Track and monitor patients over time with chronological test recording.*
- *Comparison to a normative database of early and intermediate AMD, and CNV patients.*
- *P-value scoring*

Hyperacuity Defect Clusters
- *Defines areas that are suspected as being related to AMD progression in Clusters, and from largest to smallest.*
- *Presents cluster consistency, a value indicating the likelihood that the abnormality found was caused by a genuine visual field defect.*
- *Presents total area and total volume of clusters.*
- *Displays anatomical location of defect cluster on the retina.*

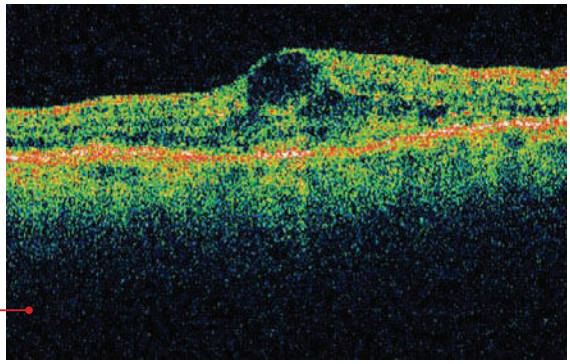
Case Study

An 80 year old female presented blurred vision for two months in her left eye, with no clinical evidence of CNV present. The Foresee PHP test was performed, and the test result showed outside normal limits with a P-value less than 1%, and significant metamorphopsia. The reliable positive PHP test indicated the possible presence of CNV. An OCT and FA confirm clinical correlation with the PHP results. The OCT showed evidence of subretinal fluid and a central macular thickness of approx 400 microns. The FA showed areas consistent with CNV. The patient underwent 3 Lucentis injections and vision improved from 20/200 to 20/20 and normalization of the OCT test.



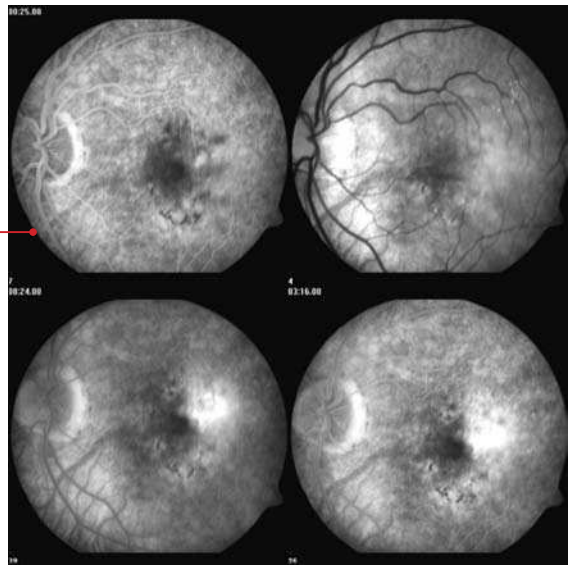
PHP

Abnormal test indicates a high probability of CNV.



OCT

Significant macular edema with increased foveal thickness.



FA

Fluorescein Angiography showed leakage consistent with CNV.

Case study courtesy of Dr. Paul Garfinkle, Ohio Eye Alliance , USA

Reichert™ TECHNOLOGIES

Foresee PHP® Preferential Hyperacuity Perimeter

Features

- Early CNV detection – The only instrument clinically validated and FDA cleared for early detection of CNV.
- Normative Database Analysis for early detection of CNV.
- High sensitivity (82%) & specificity (88%) for early detection of CNV.*
- Patient friendly – Interactive, quick, and non-invasive examination.
- Practice friendly – Touch-screen menus to expedite operations, automatic patient backup, and macular field testing in as little as 3 minutes per eye.
- Doctor friendly – Quantitative automated threshold visual field test for AMD monitoring.

* Alster Y, Bressler NM, Bressler SB et al. Preferential Hyperacuity Perimeter (PreView PHP) for detecting choroidal neovascularization study. Ophthalmology 2005;112:1758-65

Specifications

Catalog Number:	900F007
Stimulus:	Dot Deviation signal flashed over macular loci
Area of Field Tested:	Central visual field – 14°
Data Storage:	Data storage, backup, and transfer results stored on a hard drive. Dedicated USB memory stick for automatic results backup. Removable USB memory stick for results export and software upgrades.
Results Export Format:	HTML, JPEG, BMP
Networking:	Device ready for office networking
Printer:	External inkjet printer supplied
Device Dimensions:	12 inches (30 cm) height 20 inches (50 cm) width 12 inches (30 cm) depth
Chin Rest & Hand Switch Assembly Dimensions:	8 inches (20 cm) height 16 inches (40 cm) width 16 inches (40 cm) depth
Overall System Weight:	40 lbs (18 kg)
Electrical:	100-240 V, 50/60 Hz, 1A max IEC-320 standard power inlet connector for worldwide use