How Often Do You Perform Perimetry?

The short answer seems to be that it depends.

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JEFFREY D. HENDERER, MD, AND ANJANA JINDAL, MD

In our practice, we typically obtain one or, more commonly, two baseline Humphrey visual field tests (Swedish interactive threshold algorithm standard 24-2; Carl Zeiss Meditec, Inc., Dublin, CA) for patients with a diagnosis of glaucoma and glaucoma suspects. For routine follow-up, we typically obtain fields every 6 to 24 months, depending on the nature of the patient’s condition (ie, more often for borderline disease control or concerns about progression and less often for low-risk glaucoma suspects and individuals with borderline ocular hypertension [OHT]). Most patients have field testing once a year. If a change is seen, we repeat the field within 1 to 3 months, depending on the likelihood that the change is real and the amount of disease. We also repeat visual field testing when a patient reports a subjective change.

We have found that 24º fields are often highly variable and insensitive in eyes with far advanced disease, so we frequently test just the central 10º in these cases. We have considered short-wavelength automated perimetry for glaucoma suspects who can take the test reliably. We may also use this approach for reliable test-takers when they are at high risk for glaucomatous progression or when disease progression would be clinically problematic (ie, vision threatening or necessitating a change in treatment like surgery).

We would consider incorporating into our practice Progressor (Institute of Ophthalmology and Moorfields Eye Hospital NHS Foundation Trust, London, United Kingdom; marketed by Medisoft Limited, Leeds, United Kingdom) or Humphrey Glaucoma Progression Analysis software (Carl Zeiss Meditec, Inc.). Although we agree that these programs assist in identifying areas of concern in the field, they require multiple tests to establish change, and we are not sure that either adds much beyond the normal careful analysis of a glaucoma specialist.

“A recent study showed the potential utility of more frequent initial and follow-up testing to identify glaucomatous damage and/or progression. The suggestion of six fields in the first 2 years is desirable, but we wonder how we can follow these recommendations given the constraints put on us by insurance companies and the limits of patients’ cooperation.”

—Arthur J. Sit, SM, MD

HARRY A. QUIGLEY, MD

The quick answer is at least once a year, since the Wilmer Glaucoma Service follows the AAO’s Practice Pattern for Open-Angle Glaucoma. The actual number of fields per year that my colleagues and I order is more than that for several reasons.

We repeat fields quickly that are suggestive of progressive worsening. The Ocular Hypertension Treatment Study (OHTS) and Optic Neuritis Treatment Trial (ONTT) found that apparent field progression is a false alarm half the time. With patients who are not achieving the target IOP, we explain that either IOP-lowering therapy must be intensified or the frequency of visual field testing must be increased to determine if progression is happening. Some patients choose more aggressive IOP lowering, whereas others wish to test the field every 3 to 4 months.

How many fields does it take to detect a deteriorating field with certainty? Some of the world’s experts in
this area (Balwantry Chauhan, PhD; David Garway-Heath, MD; Anders Heijl, MD, PhD, and others) recently estimated the number of fields needed to determine progression. In most patients with open-angle glaucoma, the visual field changes slowly. In a patient with rapid progression (and reliable fields), however, it takes at least five fields to detect change with 80% accuracy. Thus, at a rate of two fields per year, cases of rapid progression can be detected in 2.5 years, whereas it would take 5 years with annual testing.

Chauhan et al recommend testing six times in the first 2 years of follow-up for a glaucoma patient with field loss. That way, one can identify within 2 to 3 years the minority of patients whose open-angle glaucoma is rapidly progressive (ie, those whose disease is getting worse at a rate of 2 db per year in mean deviation).

Are six fields in 2 years practical? Here is a possible scenario. After the initial visual field test, another is ordered 3 to 6 months later (when the clinician is likely to measure IOP anyway). Then, with fields each 6 months for the next 2 years, the physician will have five or six tests and

- will know that the patient cannot do fields, so the clinician can follow the structural measures
- will find that the fields are stable (the patient’s having passed through the learning curve)
- will determine that the patient’s glaucoma is rapidly progressive and requires aggressive treatment

ARTHUR J. SIT, SM, MD

The frequency with which I obtain visual fields depends on a number of factors, including the time from diagnosis, the disease’s severity, and the rate of progression.

For patients who are newly diagnosed with glaucoma, I will normally obtain three visual fields in the first year to establish a baseline. Thereafter, I will generally obtain a visual field twice a year for patients whose glaucoma is stable.

I vary this routine based on the disease’s severity. For glaucoma suspects, or glaucoma patients with a normal visual field on standard automated perimetry, I will obtain subsequent visual fields annually, even if I see them for follow-up visits more frequently. For these individuals, I may obtain optic disc or nerve fiber layer imaging more often. If they subsequently develop visual field defects, then I will revert to the normal twice-a-year field.

The rate of glaucomatous progression may also play a role in the frequency of visual field testing. For some patients who have demonstrated recent progression in glaucomatous optic neuropathy or visual field loss, I will obtain visual fields three times a year if I feel that they are at high risk of further progression. I am particularly likely to do so when the patient has advanced glaucoma and extensive visual field loss. In contrast, for patients who have a long history of stable disease, I may only obtain visual fields once a year.

ANGELO P. TANNA, MD

How often visual field testing should be performed for patients with glaucoma, suspected glaucoma, or OHT is highly variable. The main factors that dictate the frequency of testing include the underlying diagnosis and the stage of the disease, the previous duration of stability of the visual field, and the adequacy of IOP control.

In general, patients with OHT and suspected glaucoma based on the appearance of their optic discs who previously had normal visual field tests should usually undergo perimetry annually. Some of these patients are at particularly high risk for the development of glaucoma, however, such as ocular hypertensives with substantial risk factors as defined in the OHTS (ie, higher baseline IOPs, lower central corneal thickness measurements, higher baseline pattern deviation values, and higher cup-to-disc ratios). They may require more frequent testing, particularly if target pressures are unachieved. Patients with optic disc hemorrhages or with structural change in either the optic disc or retinal nerve fiber layer may require more frequent testing.

For patients with glaucoma in whom visual field abnormalities are already present, the frequency and type of visual field testing is mainly guided by the severity of the damage. The selection of the type of visual field test to be performed is very important. For patients with severe damage, clinicians should consider testing the central 10º, using a size V stimulus, or performing kinetic Goldmann perimetry. Among patients with a threat to fixation, visual field testing is usually performed every 4 to 8 months, and consideration should be given to alternating between evaluation of the central 10º and the central 24º to 30º. For a patient with excellent IOP control in whom the visual fields have been stable for years, however, annual testing is usually sufficient.

Among patients with established visual field loss at baseline, the purpose of subsequent visual field testing is to detect whether progression has occurred and to attempt to estimate the rate of deterioration in visual function. In order to successfully accomplish these goals, it is important to have at least two reliable baseline visual fields that are obtained after the patient has scaled the learning curve associated with visual field
testing. Additionally, it is important to realize that there is a great deal of fluctuation in visual function, particularly in eyes with glaucoma. A single visual field test that suggests progression therefore must be verified with repeat testing, preferably with two additional confirmatory visual field tests, before one can be relatively certain that true progression has occurred.

Finally, few patients enjoy undergoing perimetry. The caring physician is able to convince most patients of the importance of visual field testing in the management of glaucoma. In certain cases (for example, elderly patients with well-controlled IOPs and relatively mild damage), flexibility in the frequency of testing may be in the patient’s best interest.

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