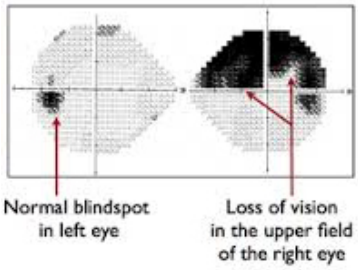
Visual Field Testing

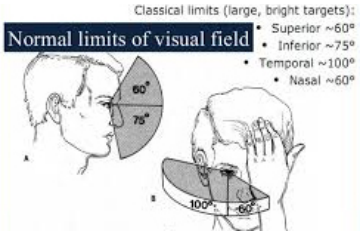
Visual field testing is one of the necessary evils in ophthalmology. While doctors consider it necessary for proper monitoring of glaucoma, patients describe it as evil (or torture or “being left alone in that dark room”; maybe we should call it the “boo box”). In any event, it’s important to have one done at least yearly once glaucoma is diagnosed. Visual field (VF) tests are used for more than just glaucoma monitoring. These tests are also useful for detecting other diseases that affect the central or peripheral vision such as brain tumors, strokes to the brain or eye, medications, or problems in the orbit.

VF monitoring was initially manually performed. In the 1980s, computers were attached and over the intervening years, the level of sophistication has increased, allowing better interpretation. But the basics of the test have not changed much, nor has the subjective nature of the test itself.



While medicine in general prefers objective tests (collecting data from a patient without any active input from them), many tests we carry out are subjective (we depend on the patient giving us feedback during the test). Since VF testing is subjective, we depend on the patient’s alertness and physical responses to judge the outcome. The VF tests not only the vision, but also much of the brain, requiring good motor skills to even press the button during the test. Due to the subjective nature, the first few VF tests are not very useful: there is a learning curve.

VF testing uses a device with bowel that has standardized illumination. Testing is done in a darkened room. The device also uses a standardized target size (the white light or scintillating object dancing about the bowl of the VF machine). These standardizations allow comparisons over time and between patients. During the test, the patient is only to look straight ahead at a fixation target. When a light or pattern of varying intensity is noticed in the periphery, a handheld button is pressed.



The intensity is purposely varied. At some point it will be too dim to see, at other times the target is bright and easily seen. At the threshold of detectability, the patient will be uncertain whether the target was seen or not. This is the point that is recorded: the threshold of seeing the test target at that particular location in the peripheral vision. So the sensation of seeing or not seeing the target is perfectly normal, but it is important to only press the button when you think you’ve seen the target. Guessing is not good. Nor is moving your eyes about the inside to look at the target. The point of the test is to check peripheral vision, not central vision.

As described on the Glaucoma FAQ page, the optic nerve has a good deal of redundancy, meaning that it can withstand significant damage before a person becomes aware of a problem. Current thinking suggests that a person needs to lose somewhere between 30 to 50% of their nerve fiber

before the peripheral vision is affected (as measured by VF testing). This means that a person might have glaucoma for 3 to 5 years before VF loss is noticeable. Therefore, early VF loss is not early disease.

VF testing is only carried out to about ± 30-degrees. Our peripheral vision much wider than this, but due to the way our eyes work, testing at greater angles is unreliable. Consequently, when VF loss is first documented, there undoubtedly is also loss of peripheral vision further out.

Because of the small test target and only testing to 30-degree angles, the VF results can be somewhat confusing to patients. For example, despite early VF loss, some patients don't recognize a problem since they can "still see a truck on my right side". In this case, the truck subtends a larger angle than the test target and is seen by the patient. But the VF loss is there and because of the more subtle nature of the VF loss, they might not see a small sprinkler head or the edge of a curb and trip over it.

VF testing is usually done yearly, or more frequently if the glaucoma seems to be changing. From time to time, the test results may seem to vary. One time one or both eyes might look a little worse, another time, slightly better. Slight variation in VF results is normal. This is termed "long term variation" because the results undulate over time. It is a by-product of the subjective nature of the VF test as described above. But, if the VFs are becoming progressively worse, then the disease is probably getting worse. In that case, treatment is altered to attempt to arrest the VF losses and better control the glaucoma.

VF testing is still an important part of glaucoma management, and a very sensitive test for central nervous system problems.