

Quick Guide

Vestibular Diagnosis and Treatment Utilizing Videonystagmography (VNG)

OPTOKINETICS (OKN)

Purpose of Test:

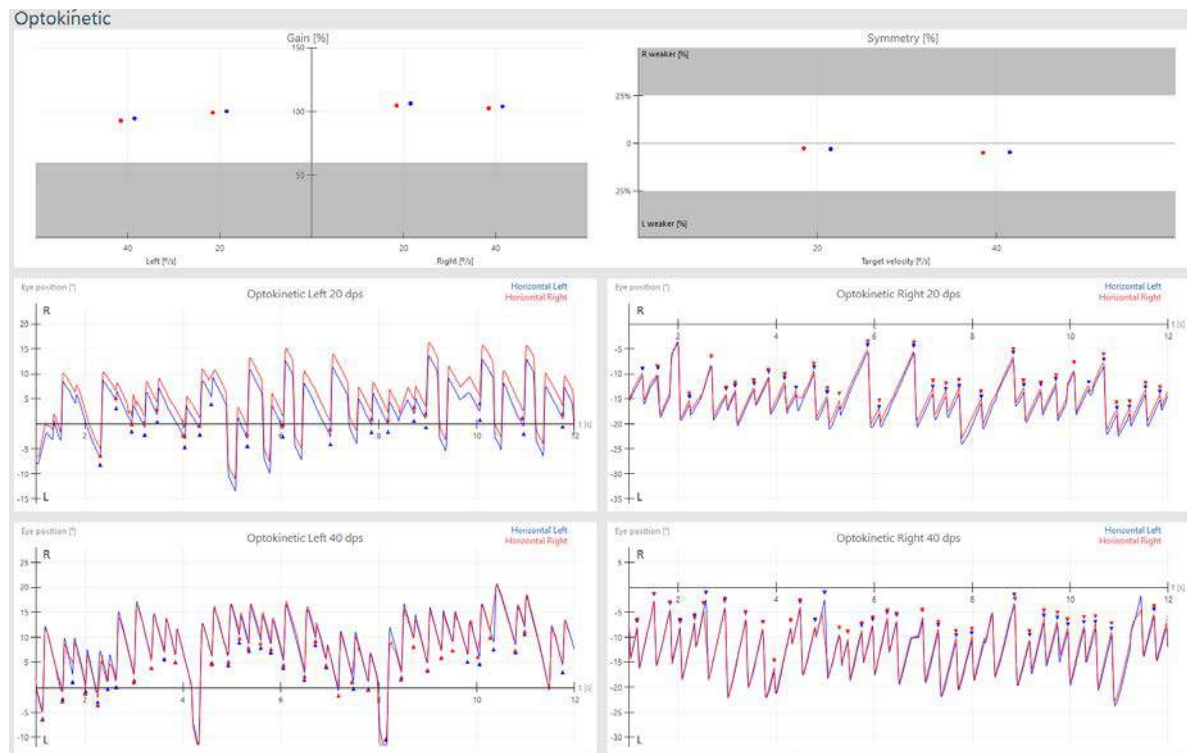
The optokinetic reflex allows the eyes to follow objects in motion while the head remains stationary. This function is performed within the central vestibular system. The inability to produce symmetric optokinetic nystagmus (OKN) implies a dysfunction of the central vestibular system. It should be noted that in order to have a valid OKN test you must stimulate the patient's entire visual field. That is why a video projector or large LCD screen is necessary for this test.

Patient Instructions:

If the test is set up to maximize the patient's visual field then very little instruction is needed since the response is a "reflex" and should occur on its own with little intervention. The patient is instructed to "simply look ahead and watch the pattern in front of you".

What to Expect:

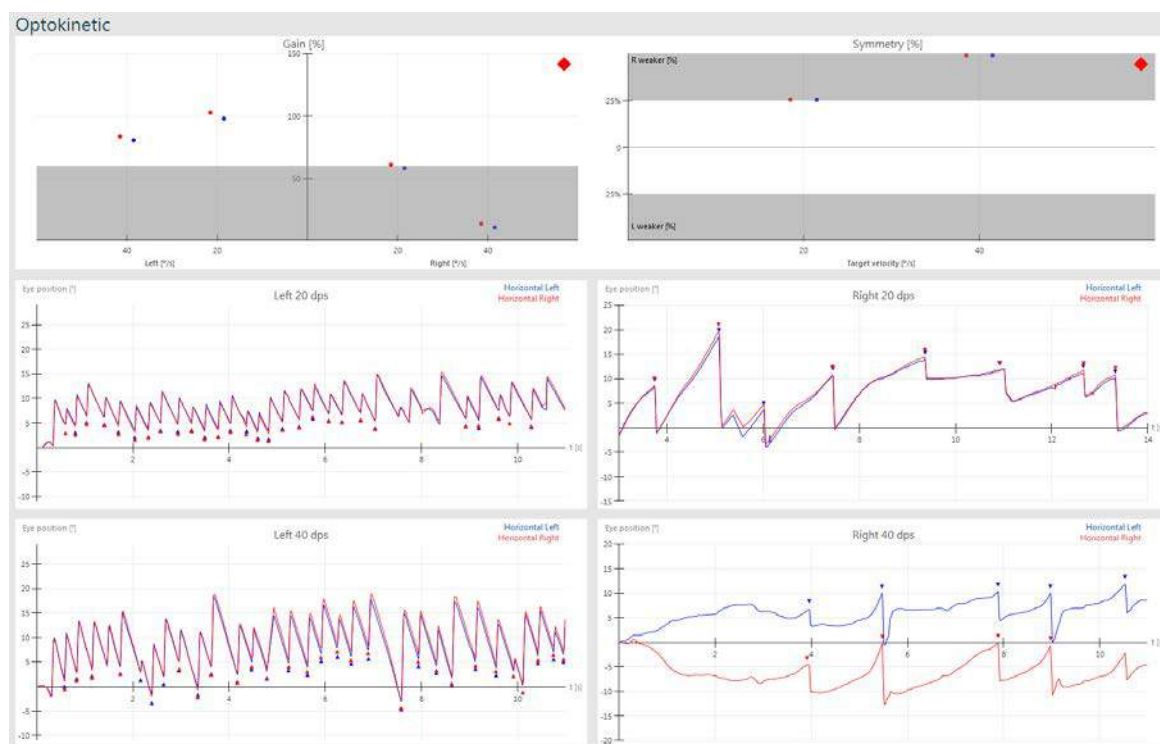
Optokinetic responses are measured for both rightward-moving and leftward-moving visual fields at varying velocities. A patient with the ability to perform OKNs normally will produce tracings that have symmetrical slow phase velocity for leftward and rightward eye movements and gain responses that are within normal limits for both directions.



Normal Optokinetic test result

Abnormal Test Results:

An abnormal response seen in one direction but not the other is highly suggestive of a vestibular disorder. If not accompanied by a spontaneous nystagmus, the disorder is likely central in origin. When the maximum speed of the slow phase velocity is less than 60% of the stimulus speed it is considered to be outside of threshold limits and when the asymmetry between rightward-moving and leftward-moving eye movements is greater than 25% it is considered to be outside of threshold limits. Gain and Symmetry graphs are displayed above the eye position traces and a data point for each target speed and each eye appear in the graphs. A red diamond will appear when any of these data points are outside of threshold limits.



Optokinetic test showing abnormal gains and an asymmetrical response

*NOTE: It is possible that the patient is able to accurately track the target in one direction, but not in the other direction. In most cases, the abnormality will present itself toward the side that has the lesion. Also, it is critical that the examiner is aware of whether the patient is actively watching the screen. OKNs are often disturbing to the patient's vestibular system. In an effort to compensate, the patient might try to "stare through" the screen. The result will appear as a "flat-line" on the tracing. This is good information in that it may indicate that the patient has adopted this "stare through" strategy in learning to compensate for the vestibular disorder.

Conclusion:

Optokinetic tests are used to determine whether there is central pathology that is precluding a reflexive response to targets moving across the field of vision while the head remains immobile. Optokinetics, when paired with smooth-pursuit, saccades and gaze tests, can provide the examiner a more comprehensive look at central vestibular function.

For a complete discussion of optokinetic parameters and protocols, refer to:

Jacobson, GP, and Shepard, NT. Balance Functional Assessment and Management, 2nd Ed. San Diego; Plural Publishing, 2015

*NOTE: This is intended only as a guide, official diagnosis should be deferred to the patient's physician.