

Checking Saccades and Pursuits – NSUCO Oculomotor Test

Testing Methods: NSUCO, DEM/King Devick, Visagraph/Readalyzer

There are a variety of means of assessing saccades, pursuits, and fixations. Some are more subjective, relying on clinical acumen and experience, while others are more standardized and established, or even computer-based. This part of the course will introduce the reader to the NSUCO (Nova Southeastern University College of Optometry) approach to assessing fine visuomotor skills. It is economical, effective, and can be very accurate when performed by an experienced clinician. Only minimal equipment is required for administration of this test, and most developmental professionals will have adequate background to engage in this training.

The DEM (Developmental Eye Movement) Test and the King-Devick ('king'-'deevik') tests are similar tests that rely upon established scan patterns and normative data for observation and scoring. The patient is given initial assessment cards where they must scan numbers left-to-right and top-down. Scoring is based on number of numbers read in correct sequence, as well as overall time. There is a progression of test cards with increasing density of numbers and lines to be read. In the case of the DEM, there is also a comparator of vertical vs. horizontal readings skills, with the vertical scanning taken as the baseline, and the status of horizontal scanning rate and accuracy measured in part as a function of the vertical scanning ability.

The 'Visagraph' is a hardware and software kit that is purchased as a package. It includes goggles that are fit precisely onto the patient's face, and these are used to scan micro-movements of the eyes as they target different visual signals on test pages. The goggles attach to a computer running the Visagraph software which provides data analysis, display, and storage. A child's progress, then, is tracked over time as he proceeds through therapy. Testing is done using age- and grade-appropriate text, but there are also simple tests of number scanning, saccades, and fixations, these last two known collectively as 'visual skills' under the Visagraph paradigm. This clinician will only rarely use the text-based tests and prefers the non-literate numbers and visual skills tests. For more literate children, it is useful to compare number and visual skills results with reading scores, and likewise to compare silent reading scores to scores when text is read aloud. Read more about Visagraph at www.visagraph.com, or you can also view Visagraph videos on YouTube. A homologous visuomotor scanner/analyser called the 'Readalyzer' is also available. To learn more, see <http://www.oepf.org/product/readalyzer-eye-movement-recording-system-0>

NSUCO Oculomotor Test Protocol

Please see attached PDF ([NSUCO Oculomotor Test](#)) for complete instructions for administering the NSUCO oculomotor test. This should be studied and then practiced on several adult subjects prior to assessing children's behaviour. You will note that children 5

years and younger will almost always show deficits in motor function, and so these must be taken in context. Clearly, significant cases should be scheduled for monitoring and further assessment by developmental vision specialists (see list of [Providers](#).) Also, it is important to note that observation of saccades, pursuits, and fixations do not shed light on binocular alignment and posture – these should be done via the ‘cover-uncover’ test.

See also:

- [NSUCO Norms](#)
- [NSUCO Oculomotor Test – PUCO](#)
- [Oculomotor differences between good and bad readers](#)
- [King-Devick Test](http://kingdevicktest.com/) — <http://kingdevicktest.com/>
- [King-Devick Score Sheet](#)
- [DEM](http://www.bernell.com/product/1501/417) — <http://www.bernell.com/product/1501/417>
- [DEM Validity Study](#)
- [DEM Test Notes](#)
- [DEM Scoresheet](#)

Please note, the samples given above are for reference only. Should you choose to use one of these tests, they can be ordered directly from the publishers.

Notes on Using the NSUCO Test In Practice

The notes provided are very specific about the sort of targets used for testing. These are not always readily available, and are certainly not required for testing. The norms provided are based on using similar targets, and the clinician is encouraged to use the recommended targets if the normative tables are to be used. In this clinician’s practice, I am sure to provide consistent targets across tests in a population and these would be roughly equivalent to what NSUCO demands. For example, a 2mm wide dot on the tips of the index fingers can work, or the tips of medium point pens if they are bright enough. Simple ‘dots’ drawn on fingers or pen tips may not be appropriate for especially young or challenged children, and so at times by drawing rudimentary faces on the fingers (eyes, a dot for the nose, and a line for the mouth) and have the child focus on the ‘nose’. One can also use a fine point light source (not a laser!), though this is preferred only in extreme cases. Generally, if a child cannot follow a point on a finger, there are serious visual control concerns. In all cases of DOMD/FOMD, a referral to therapy is indicated on a priority basis, especially if reading/learning problems are suspected. **All cases of pediatric strabismus and amblyopia should also be referred to developmental optometry on an urgent basis.**