In a recent article Maureen K. Powers, Ph.D., discusses several tests that are in current use to assess visual functioning. They include the Amsler Grid, the Pelli-Robson Contrast Sensitivity Chart, the Teller Acuity Cards and the Developmental Eye Movement Test (DEM). Some commonalities of these tests are their ease in administration, their rigorous design, and that they are based in sound scientific evidence. In essence they are the clinical applications of knowledge that was developed in the laboratory setting. The first three cited tests are used by most clinical optometrists and ophthalmologists. In contrast, the DEM is primarily used by optometrists who provide diagnosis and therapy in the realm of dysfunctions of binocular vision and learning related vision problems. Indeed, it is my impression that the DEM is a standard test for the great majority of their patients.

A new edition of the test recently became available. There are several noteworthy upgrades from the original version. Dr. Jack Richman, chief among the developers of the 1990 version, has significantly expanded the manual. He traces the history of assessing saccadic eye movement efficiency by timing the calling out a series of horizontally arranged single-digit numbers. Dr. Richman points out the DEM’s innovation was to include a series of vertically arranged numbers. This is to account for the visual to verbal, or automaticity component that is inherent in the test. Consequently, it can adversely effect performance on the horizontal test that can be equated to reading eye movements. One measure of the popularity of the DEM is the number of investigations into its validity and reliability. Included in the new edition are the results of 15 studies on validity, and seven on reliability that have been conducted over the past 20 years.

The section on test administration is more instructive than the original version. It contains two flow charts; the first outlines a strategy when the vertical derived test score is low, and the second a strategy when the horizontal derived test score is low. Further, the explanations of the case types based on the ratio scores (horizontal divided by vertical time scores) is more inclusive than on the previous version.

The second major strategy is based on the suggestion made by Solan and Suchoff. They proposed that scores within one standard deviation (SD) from the mean, or 16th percentile are appropriately considered as passing in, for example, medical laboratory tests. However, Solan and Suchoff recommended that it is too generous in performance tests like the DEM. They proposed that scores below 0.5 SD or 34th percentile are appropriately considered as failing.
percentile are more appropriate for these types of tests. This concept was refined and expanded by Tassinari. He suggested that while one SD cutoff is appropriate for visually non-symptomatic children, it is not for symptomatic children. For the latter group, a cut off of 0.5 SD is more useful. A list of generally accepted symptoms is included in the manual.

This type of differentiation is made clinically easy to determine by virtue of the last of the upgrades. A compact disc is included with the new edition. The examiner chooses from the menu whether the performance is to be scored as part of a screening program for non-symptomatic patients, or as a clinical program for those who are symptomatic. The testing goes on as originally proscribed, but the examiner then inserts the raw time and error scores into the appropriate spaces in the basic computer screen image rather than on a sheet of paper. See Figure 1. When all required information is placed in the spaces of the basic screen, the computer analyzes the results according to age and equivalent grade. This negates the necessity of manually going to the age and grade equivalent tables that are required in the original edition of the DEM. Figure 2 depicts the performance and assessment of a patient who is non symptomatic and is scored at the one SD level. Figure 3 shows the same performance, but different age and grade equivalent assessments when the patient is symptomatic and scored at the 0.5 SD level. The color-coded circles in Figure 1 indicate the performance level for each component of the analyses in Figures 2 and 3. Dr. Barry Tannen of Hamilton Square, NJ, and Dr. Sharon Berger of Roswell, GA, are both recent users of the new edition of the DEM. They both noted the ease of use as compared to the first version. Dr. Tannen commented that a feature was the automatic categorization of the patient into the typing that finds the patient to be within the expected in terms of the automaticity and ocular motor interactions, or if one or both of these factors are below the expected. Dr. Berger had stopped using the DEM but has routinely began using it, and particularly liked the computer print out that she stores in the patient record.

Dr. Suchoff has no financial interest in Bernell Corporation.

References:

For product information:
Bernell Corporation
4016 N. Home St.
Mishawaka, IN 46545
www.bernell.com

Scoring software © 2008 Software In Motion. All rights reserved. Software written by Scott Steinman, O.D., Ph.D.