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Farnsworth/Lanthony Combined D-15 Test - Instructions

Introduction to the Farnsworth/Lanthony Combined D-15 Test- Clinical color vision testing is typically performed using a pseudo-isochromatic series such as the Ishihara plates. While an excellent screener for congenital red-green color deficiencies, the Ishihara plates are not quantitative for the level of the defect. Furthermore, they do not test for blue-yellow defects which can be congenital but which are common in the acquired color losses that are caused by lenticular, retinal and neuro-eye disease processes. The issue of testing more accurately for acquired losses is becoming increasingly important in light of our aging (baby-boom) generation, who are beginning to create an increasing incidence of new cases of these age-related eye problems.

Gulden Ophthalmics Farnsworth/Lanthony Combined D-15 Test accomplishes improved color vision testing because it is a pair of color arrangement panels, each with different sensitivity. Color arrangement test panels are useful because they provide a map of all of the patient's color confusions no matter which axis of the patient's color space is involved. This is how the Protan, Deutan and Tritan color confusion axes are each evaluated in one test. In addition, the Farnsworth/Lanthony Combined D-15 Test affords the examiner the opportunity to test at two levels of sensitivity, thus enabling the quantification of the level of the defect. Therefore, the Farnsworth/Lanthony Combined D-15 Test is a convenient combination of two classical color arrangement tests: Farnsworth's Dichotomous Test Panel D-15 Test and Lanthony's Desaturated 15-Hue Test.

Farnsworth's D-15 test was called dichotomous because it was designed to separate persons tested into one of two groups: 1) strongly color deficient or 2) mildly color deficient and/or color normal. The Farnsworth D-15, therefore, is comprised of color arrangement caps that have vivid colors (i.e.: high spectral saturation). This makes the D-15 a relatively easy test and failure is indicative of a strong color deficiency.

In contrast, the Lanthony desaturated 15-hue panel has test caps with the same colors, but which are much less vivid (i.e.: desaturated). The Lanthony test, therefore is much more sensitive to even minor color deficiencies, which makes it an excellent test for the detection of even mild color loss. Persons passing the Lanthony panel can be considered color normal.

Procedures:

Illumination: To be accurate, the Farnsworth/Lanthony Combined D-15 Test must be conducted under daylight conditions (i.e.: CIE- Illuminant-C). This can be accomplished by a Macbeth lamp or by the use of any 60, 75 or 100 Watt bulb combined with the patient wearing Gulden Ophthalmics "C" Daylight Glasses which accurately color corrects common incandescent sources to Illuminant-C (i.e.: 6500oK).

Handling: Preservation of the test quality over time requires that the colored surfaces of the test caps be protected from becoming faded or soiled. The closed storage box will protect the colors from dirt and from fading due to light when the test is not in use. During the color test procedure, however, is when the risk of soiling is greatest. This is usually due to oil and dirt from the skin of patients and examination personnel who touch the surfaces. Be sure to instruct the patient to be careful not to touch the colored surfaces. It is even better if the patient wears a clean pair of white cotton gloves such as those provided with the test at the time of initial purchase, and which are commonly available at most photographic stores.

General test procedures: Whichever test is used, the general test procedure is as follows: 1) the box is opened with the inner retaining flap set exposing the desired test. With the outer box lid open, it is now possible to slide the 15 test caps out of the open right end of the box onto the testing surface. If this is done carefully, the caps will all remain upright. The caps should be arranged randomly on the surface. The patient is then instructed to locate the cap within the group of 15 that is closest in color to the starter cap, which remains fixed in the storage box. Once located, the first cap selected should be placed in the box adjacent to the starter cap. Next, the patient should choose the next cap, which is now closest in color to the one that was just put into the box. This cap is then placed in the box in a similar manner to the first. This process is repeated until all the caps on the testing surface are now back in the storage box. At this point the patient is allowed to make any final adjustments they might wish to make to the position of any test cap, with the goal of making the caps proceed logically from left to right in terms of their spectral hue progression. At this point the inner flap of the storage box may be flipped to the alternate position to enable performance of the other test panel. (NOTE: Desaturated cap numbers are circled)

General scoring procedure: When all testing is completed, the outer lid of the storage box is closed to prevent spilling, soiling or fading of the caps. Once closed, the box is then turned over exposing the clear plastic bottom. For each test performed, the order of the cap placement is recorded on the appropriate portion of the Gulden test score sheet. Connecting the dots on the circular plotting form for each test then plots this order.

Interpretation: Complete passing of either test occurs when the sequence of cap placement is exactly correct and the circular plot for that test has no crossovers. A mild failure of either test occurs when there are crossovers occurring around the circle, usually involving 1 or 2 cap positions. Major errors occur when the crossovers go across the circle graph, often defining an axis of the color deficiency type.

About 5% of the male population will demonstrate mild failure of the D-15 test by the crossover of caps by one or two positions. The Desaturated test is highly sensitive to mild errors of color perception, especially in cases of acquired color loss. Persons over the age of sixty often will demonstrate at least some minor crossovers due to the yellowing of their lenses.