



Waggoner

The Color Vision Testing Suite

Clinical Studies and Validation
of Color Vision Testing Made Easy

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Clinical Research & Studies of Waggoner Color Vision Tests

Color Vision Testing Made Easy Description

Color Vision Testing Made Easy (CVTME) is the pediatric gold standard for identifying genetic (red/green) color vision deficiencies in children as young as 3. It consists of one demonstration plate and 9 test plates displaying circle, star, and/or square throughout the plates and can be completed in under 60 seconds. On most plates, children will be able to see at least one symbol even if they are color vision deficient. If they can't identify one symbol on the first few plates, they may not understand the test.

In addition, CVTME provides a quick screening by using 4 cards that have a car, dog, boat, and house. This test can be completed in less than 30 seconds.

CVTME is brilliantly simple to take and just plain fun for children. Considered the gold standard for pediatric assessment of color vision deficiencies in over 40 countries. Additionally, the "World" US Special Olympics Team have depended on CVTME to screen athletes over the years at their events.

Color Vision Testing Made Easy Validation & Research Use:

Barnhardt, C., Block, S. S., Deemer, B., Calder, A. J., & DeLand, P. (2006). Color vision screening for individuals with intellectual disabilities: a comparison between the Neitz Test of Color Vision and Color Vision Testing Made Easy. *Optometry (St. Louis, Mo.)*, 77, 211–216.

Summary:

A total of 301 Special Olympics floor hockey athletes from San Diego and Long Beach California were screened for color vision deficiencies. Each athlete was administered the CVTME and the Neitz tests. Overall, the study results suggest that the CVTME continues to be the screening test of choice for evaluating color vision in individuals with intellectual disability.

Cotter, S. A., Lee, D. Y., & French, A. L. (1999). Evaluation of a new color vision test: "color vision testing made easy." *Optometry and Vision Science: Official Publication of the American Academy of Optometry*, 76, 631–636.

Summary:

A total of 41 adults, 20 with normal color vision and 21 with red-green color vision deficiencies, were given a battery of color vision tests including CVTME. In addition, 152 kindergarten children ages 5 -7 were also screened using the CVTME. The results showed a 90.5% sensitivity and 100% specificity. Testability of kindergarten children was found to be 100%. This preliminary study indicates that the CVTME appears to be an excellent screening instrument for red-green color deficiency in adults and has been shown to also be useful for examining color vision in children 5 to 7 years of age.

Cotter, S., & Jenewein, E. (2014, June). *Pediatric Eye Exams: Tricks of the Trade*. Presented at the American Optometric Association, Philadelphia, PA.



Summary:

A simple and efficient approach for conducting eye examination for infants, toddlers, and preschool children was presented. Age-appropriate techniques for the assessment of visual acuity, eye alignment, refractive error, and ocular health were discussed. Part of ocular health testing included color vision testing using the "Color Vision Test Made Easy" test as well as the Waggoner HRR. Both tests are recommended for continued use in this population of children as a result of the conducted assessments and studies.

Erickson, G. B., & Block, S. S. (1999). Testability of a color vision screening test in a population with mental retardation. *Journal of the American Optometric Association*, 70, 758–763.

Summary:

The test was presented to Special Olympic athletes at several different events throughout the U.S. and Canada. The overall rate of testability was 93.2% for the 1078 athletes screened. The "Color Vision Testing Made Easy" color vision test was successfully completed by a very high percentage of Special Olympics athletes. These results suggest that this test is useful in screening this population for color deficiencies, and that the prevalence of color vision deficiencies is approximately the same in individuals with mental retardation as in the general population.

Formankiewicz, M. (2009, October). *Assessment of Colour Vision*. Continuing Education presented at the Association of Health Professions in Ophthalmology. Retrieved from <http://www.ahpo.net/assets/CET%20C-11998.pdf>

Summary:

The aim of this article is to give an overview of a selection of color vision tests. The design of these tests, as well as their advantages and limitations were discussed. Specifically, the article compares a range of color vision tests including the Waggoner HRR, Anomaloscope, Ishihara pseudoisochromatic plates, Lantern tests, Cambridge color test among several others. Both sensitivity and specificity are described and compared for all tests including the CVTME, which has a sensitivity of 91% and specificity of 100%.

Hasrod, N., & Rubin, A. (2015). Colour vision: A review of the Cambridge Colour Test and other colour testing methods. *African Vision and Eye Health*, 74, 1-7.

Summary:

The evaluation of color vision forms an integral part of a routine eye and vision exam. With the increasing prevalence of inherited color vision deficiencies, defects of color vision can be detected in an optometric practice by means of a variety of tests available. This article provides an overview of the design and function of a selection of color vision tests that are administered manually and have been modified to form computerized versions such as the Color Vision Test Made Easy (CVTME) test.

If interested in more articles that included CVTME in their research or writings, please find the following articles for you to peruse:

Dain, S. J. (2004). Clinical colour vision tests. *Clinical & Experimental Optometry*, 87(4–5), 276–293.



Djiwatmo Irma Praminiarti. (2011). Time Length Difference of Examination between Waggoner (Color Vision Testing Made Easy) and Ishihara in Children Under 6 years Old. *Jurnal Oftalmologi Indonesia*, 8, 11–13.

Duckman, R. H. (2006). *Visual Development, Diagnosis, and Treatment of the Pediatric Patient*. Lippincott Williams & Wilkins.

Elawad, H., Hamad, A., & Elawad, M. (2017). Assessment of color vision in elderly patients: Pre- and post-cataract surgery. *Albasar International Journal of Ophthalmology*, 4, 18–22.

Mercer, M. E., Drodge, S. C., Courage, M. L., & Adams, R. J. (2014). A pseudoisochromatic test of color vision for human infants. *Vision Research*, 100, 72–77.

Pompe, M. T., & Kranjc, B. S. (2012). Which psychophysical colour vision test to use for screening in 3–9 year olds? *Slovenian Medical Journal*, 82.

Suero, M. I., Perez, A. L., Diaz, F., Montanero, M., Pardo, P. J., Gil, J., & Palomino, M. I. (2005). Does Daltonism Influence Young Children's Learning? *Learning & Individual Differences*, 15, 89–98.

Taub, M. B., Bartuccio, M., & Maino, D. (2012). *Visual Diagnosis and Care of the Patient with Special Needs*. Lippincott Williams & Wilkins.