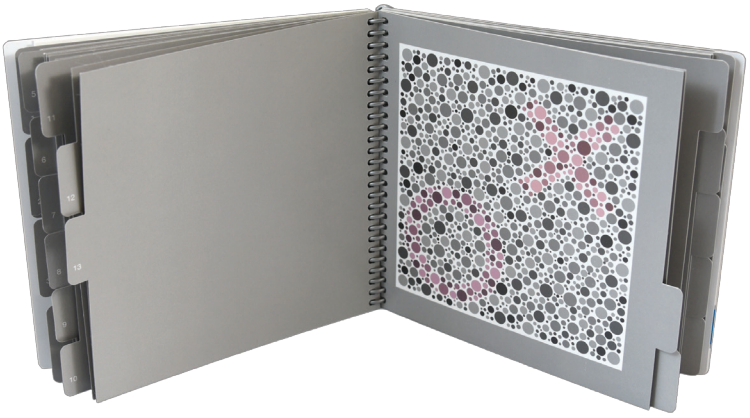
HRR Pseudoisochromatic Plates 4th Edition

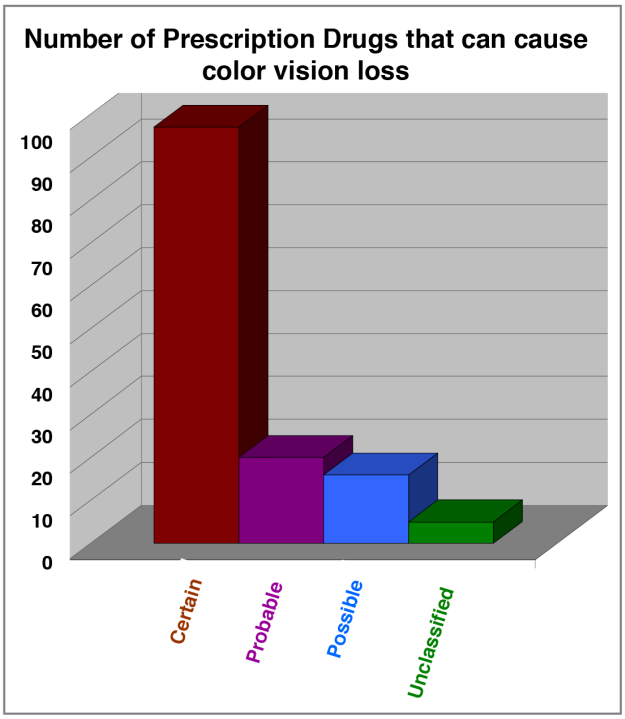
Technical Bulletin



World's Most Advanced Color Plate Test

The HRR (Hardy Rand and Rittler) 4th Edition has three very important features that provide the most advanced color vision test available: congenital and acquired testing, identification of the type of defect and diagnosis of the extent of the defect as well as quick positive classification of normals. The HRR employs a sophisticated strategy that virtually eliminates the potential for memorization and malingering. The figures used by the HRR are independent of language and suitable for both adults and children. The HRR has achieved worldwide acceptance with a guide for the test administrator available in more than 20 languages. Extensive clinical trials employing almost 100 normals and 125 color defectives testify to HRR efficacy.

The HRR Color test is also available with an optional Expanded Amsler Grid set designed to support protocols that recommend testing with both color vision and scotomata.



Importance of Acquired Testing: Toxicity to New Drugs

Fredrick T. Fraunfelder, MD, Fredrick W. Fraunfelder, MD, and Wiley A. Chambers, MD, have authored and edited some of the most well known books in the field of ocular toxicology. Their latest project, entitled Clinical Ocular Toxicology, provides comprehensive coverage of all drugs' generic and trade drug names, primary uses, ocular systemic side effects, and clinical significance, like its best selling predecessor. It lists over 125 prescription drugs that can cause color vision loss (see chart) usually in the detection of yellow or blue (Tritan). The Fraunfelder book is available on page 13.

Competitive Comparison: Makes Ishihara Obsolete

Competitive comparison among currently available Pseudoisochromatic plate tests and basic arrangement tests justifies the overwhelming shift in medical schools towards the HRR 4th Edition. The Ishihara test, in particular, is clearly obsolete due to longer time to administer and incomplete coverage from lack of Tritan plates. Testing for acquired defects (Tritan) is becoming increasingly important in occupational settings as the population ages. Further, toxicity from an increasing number of prescription drugs, industrial solvents and ocular diseases can be detected by the loss of yellow and blue (Tritan) color vision.

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Product	Screening?	Congenital	Acquired	Ability to Classify	Determine Extent	Number of Plates	Pediatric Version	Time to Administer
HRR 4TH Edition	Yes	Yes	Yes	Yes	Yes	24	Yes	Quickest
Ishihara - 24 Plate Version	Yes	Yes	no	No	No	24	Separate	Incomplete
City University, London	Yes	Yes	Yes	Yes	No	10	No	Moderate
Dvorine	Yes	Yes	No	No	No	23	No	Moderate
Lanthony Tritan Album	Yes(BY only)	No	Yes	No	Yes	5	No	Quick
SPP1	Yes	Yes	No	Yes	No	19	No	Slower
SPP2	Yes	Some	Yes	Yes	No	12	No	Slower
Farnsworth D15	No	Yes	Yes	Yes	Medium/ Strong	16 Chips	Yes	Slow
Lanthony Desaturated 15	No	Yes	Yes	Yes	Mild Only	16 Chips	No	Very Slow

Clinical Trials and Standards

More than a half dozen clinical trials have been conducted focused on the HRR 4th Edition. Two key studies are: 1.) The Good-Lite HRR Pseudoisochromatic Test for Color Vision Is Better Than the Ishihara Test by Barry Cole, Ka-Yee Lian and Carol Lakkis published in Clinical and Experimental Optometry (Australia).Tests conducted at University of Melbourne March 2006; 2.) Evaluation of an Updated HRR Color Vision Test by Jay Neitz, Maureen Neitz, Diane Tait and James Bailey published in Visual Neuroscience. Tests conducted at Medical College of Wisconsin May-June 2004. Copies available upon request. The HRR has been accepted by the U.S. FAA for both pilot and traffic controllers. It is now included in the list of allowable color screening tests in their AME Guide.

Easy to Remember

The HRR Pseudoisochromatic Plate Test 4th Edition supports very efficient color deficiency screening. The first four plates are used to show the patient how the test works. The fourth plate in this demonstration series has no figure and serves to potentially uncover attempts to memorize this test. The next six plates (screening series) present the most difficult Protan, Deutan and Tritan (red, green, yellow, and blue) targets. Success with these plates defines the subject as having 'normal color vision' and completes the test. The subsequent 14 plates are the diagnostic series and provide diagnostic as to the extent (mild, medium or strong) and type of defect (Protan, Deutan, Tritan).

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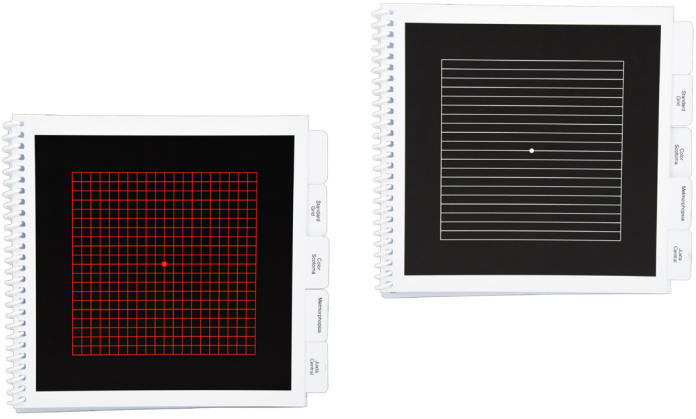

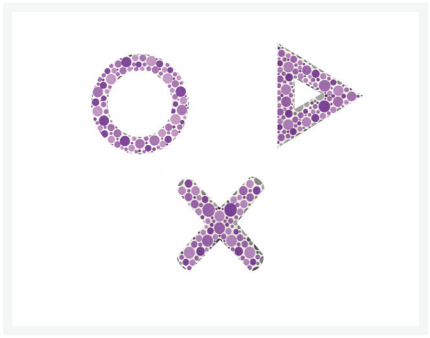

Choice of Packaging and Plaquenil Referral Package

The most popular configuration of the HRR is called the HRR/Amsler Laminated combination which provides the full 24 plates laminated to protect them against the acid in fingerprints. The HRR/Amsler also provides an Expanded Amsler Grid Set with 7 Grids. In addition to the 4 grids we've always included (White on Black, Diagonals, Red on Black, and Subdivided Squares), this Expanded Set adds the White Dots, Parallel Line and Parallel Line with Central Line Grids. Testing for yellow and blue color with the HRR as well as scotomata with Amsler Grids supports the protocol for drug toxicity testing such as Plaquenil Screening.

A less expensive configuration called the HRR Laminated Version provides the full 24 HRR Plates without the Amlser Grids.

The Standard configuration includes the full 24 plates printed on acid free archival paper (similar to the Ishihara Plates).

All configurations include a laminated score sheet, a guide in English, and a pointer to be used by the patient to identify the targets.

Helpful Accessories

HRR Matching Kit

Provides laminated matching card and three flash cards with each of the HRR targets. Set is used to teach younger patients the 'matching' concept for subsequent color testing. Also includes an extensive write-up (laminated) for the parents to help them understand the occupational implications of color vision defects.

Color Test Daylight Illuminator

The Daylight bulb gives off 6280 degree K light which closely matches the standards set by the International Commission of Illumination and had been approved by the U.S. Food and Drug Administration and the U.S. Defense Personnel Support Center for the armed forces. Daylight illumination has been found to be very important for acquired color vision defects (such as Plaquenil screening) and critical occupational applications. Consistency of lighting from exam to exam is very important in detection of drug interactions. Further, the use of daylight has been found to be very beneficial in stereopsis, and visual acuity testing.

Occluding Glasses

Acquired testing must be conducted monocularly as toxic affects occur monocularly.

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HRR 4th Ed	Description	Part Number
Standard English	24 plates, brush, English guide, and score sheet	730006
Laminated English	24 laminated plates, brush, English guide, score sheet	730005
Laminated English HRR/Expanded Amsler Combo	24 laminated plates, 7 Amsler Grids, brush, English guide, score sheet	730020
Red/Green Subset	16 Red/Green plates, brush, English guide, score sheet	133965
Blue/Yellow Subset	8 Blue/Yellow plates, brush, English guide, score sheet	136967
Accessories		
HRR Camel Hair Brush	Brush to avoid fingerprints - replacement	659300
Occluding Glasses	Reversible Metal Frame with spring loaded temple for acquired testing	452300
HRR Pediatric Matching Kit - English	Laminated cards with an English guide for parents	451800
Color Test Daylight Illuminator	Daylight bulb gives off 6280 degree K light	612600
Daylight Bulb	Replacement Daylight bulb	800540

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PDF guides are available in the following languages:

Arabic (MSA)	**Danish**	**Hungarian**	**Portuguese**
Bulgarian	**Dutch**	**Italian**	**Spanish**
Chinese: Mandarin	**English**	**Japanese**	**Swedish**
Chinese: Traditional	**French**	**Korean**	**Thai**
Croatian	**German**	**Malaysian**	**Turkish**
Czech	**Greek**	**Polish**	

References:

Bailey, James E, Neitz, M., Tait, D., Neitz, J (2004). Evaluation of an updated HRR color vision test. Visual Neuroscience 21, 431-436, Cambridge University Dain, S.J. (1998). Daylight simulators and colour vision tests. Ophthalmic and Physiological Optics, 18(6) 540-544. Dain, S.J. and Honson, V.J. (1989) Selection of an optimal light source for the FM 100-Hue Test. Doc.Opthtalmol. Proc. Ser. 52, 425-432Dain, S.J. and Honson, V.J.(1993) Suitability of Fluorescent tube sources for the Ishihara Test in Colour Vision Deficiencies XI, pp. 327-333.