



## 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 test strategy that virtually eliminates the potential for memorization and malingering. The figures used by the HRR

Pseudoisochromatic Plates are independent of language and suitable for both adults and children. The HRR 4th Edition has achieved worldwide acceptance with instructions for the test administrator available in more than 20 different 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.

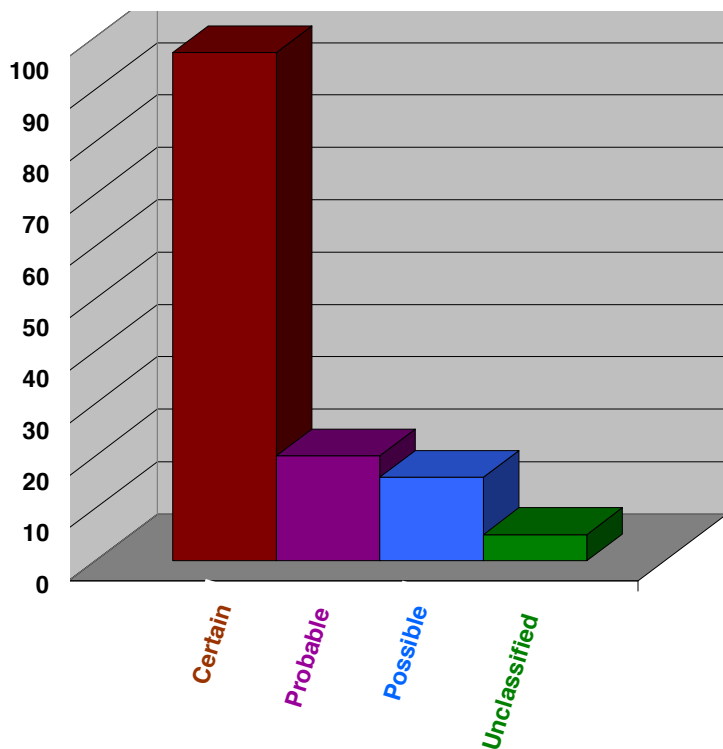
## Importance of Acquired Testing: Toxicity to New Rx Drugs

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.

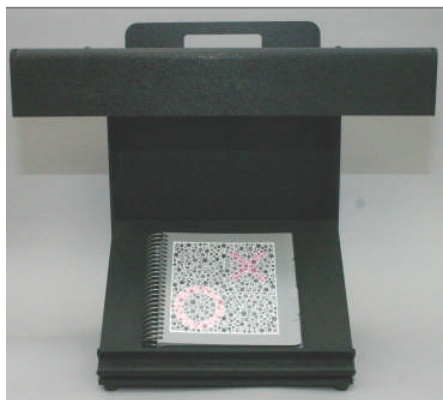
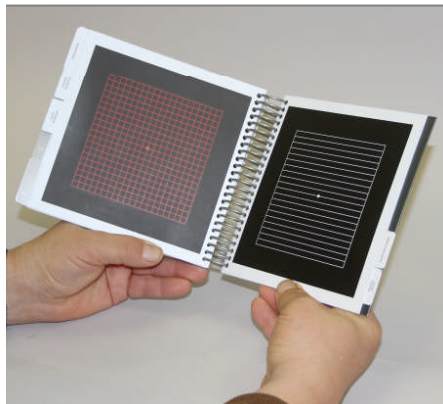
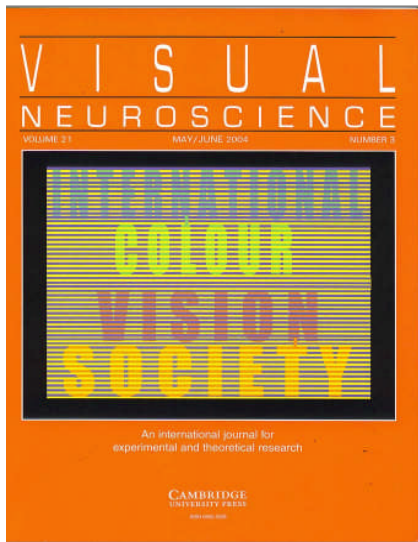
## Competitive Comparison: Makes Ishihara Obsolete

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.

Number of Prescription Drugs that can cause color vision loss



Product	Screening?	Con-genital	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(BYonly)	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 New Richmond HRR Pseudoisochromatic Test for Colour 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 Administer

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).

## 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 HR Laminated Version provides the full 24 HRR Plates without the Amsler Grids.

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

All configurations include laminated score sheet, English instructions 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.

### Daylight Illuminator and Glasses

All color tests are calibrated to be administered under daylight conditions. The Daylight Illuminator provides 6280 degree K light which closely matches the standards set by the International Commission of Illumination. Consistent lighting is also important when tracking drug toxicity effects. 'C' Daylight glasses convert incandescent lighting to daylight levels.

### Occluding Glasses

Acquired testing must be conducted monocularly as toxic affects occur monocularly. These Occluding Glasses are included in Combo and Laminated Sets and are available separately.

# HRR Options

All HRR Tests are CE marked.

HRR 4th Ed Package	Description	Part Number
Standard English Version	24 plates, brush, English instructions and score sheet	13396R
HRR/Amsler Combo - English	24 plates, 7 Amsler Grids, brush, English instructions, score sheet, occluding	5858R
Laminated English Version	24 laminated plates, brush, English instructions, score sheet, occluding	13396LMR
Laminated English HRR Expanded Amsler Combo	24 laminated plates, 7 Amsler Grids, brush, English instructions, score sheet, occluding glass	5860R
HRR Standard with Daylight C Glasses	HRR Standard, brush, English instructions, score sheet, C Daylight Glasses	4628R
HRR Laminated with Daylight C Glasses	HRR Laminated, 24 Plates, brush, English instructions, score sheet, C Daylight Glasses	5752R
HRR Expanded Amsler Combo with Daylight C Glasses	HRR Laminated with 7 Amsler Grids, brush, English instructions, score sheet, C Daylight Glasses	5743R
Red/Green Subset	16 Red/Green plates, brush, English instructions, score sheet	13396RGC
Blue/Yellow Subset	8 Blue/Yellow plates, brush, English instructions, score sheet	13396BYC
<b>Accessories</b>		
HRR Camel Hair Brush	Brush to avoid fingerprints - replacment	5869R
HRR 3rd Edition Score Pad	100 pages	13397R
HRR 4th Edition Score Pad	100 pages- supports HRR 4th Edition	4594R
HRR 4th Edition laminated Score sheet	Sold Seperately	4894
Occluding Glasses	Reversible Metal Frame with spring loaded temple for acquired testing	4523C
HRR Pediatric Matching Kit - English	Laminated cards with English instructions to parents	4518C
Daylight Illuminator with easel	Daylight bulb, 110 Volt only, UL	5137R
Daylight Bulb	Replacement Daylight bulb	6665R
Daylight Illuminator-120/220V with easel	Daylight bulb, 120/220 Volt 50/60 Hz, Universal Power Supply, UL, CSA, CE	5735R
Multi-Language Instruction CD	Includes latest version of foreign language Instructions in PDF and MS-Word	911601

## Multi-Language HRR Instruction CD now available in 23 languages!

In order to simplify the HRR product offering, we have included all of the HRR instructions in the following additional languages plus English on one Multi-Language CD:

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

For each language, the CD includes both the PDF and MS-Word version of the HRR instructions. Score sheet is also included. The Multi-Language HRR CD is included in the versions shown below:

Multi-Language HRR 4th Ed Package	Description	Part Number
Multi-Language HRR Standard (Archival paper)	24 plates, brush, English instructions and score sheet plus Multi-Language CD	5861R
Multi-Language Laminated HRR	24 Laminated plates, brush, English instructions, score sheet, occluding glasses plus Multi-Language CD	5863R
Multi-Language Laminated HRR with Expanded Amsler Grids	24 Laminated plates, Expanded set of 7 Amsler Grids, brush, English instructions, score sheet, occluding glasses plus Multi-Language CD	5864R

Note: The Multi-Language CD also includes instructions for the Expanded Amsler Grids in English and French, Portuguese, and Spanish.



# Daylight Illumination for Color Vision Testing

Each of the color tests listed recommends daylight or equivalent for proper illumination. This includes Farnsworth D15, 100 Hue, SPP, HRR and Ishihara, for example. The True Daylight bulb gives off 6280 degree K light which closely matches the standards set by the International Commission of Illumination. The Tru-Daylight bulb has been the subject of numerous color vision testing studies (see list below) and has been the recommended light source since the MacBeth Lamp became unavailable. The Daylight Illuminators have been approved by the U.S. Food and Drug Administration and the U.S. Defense Personnel Support Center for the armed forces and provides a Color Rendering Index (CRI) of 94 as recommended in various clinical studies and the National Research Monograph. 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.

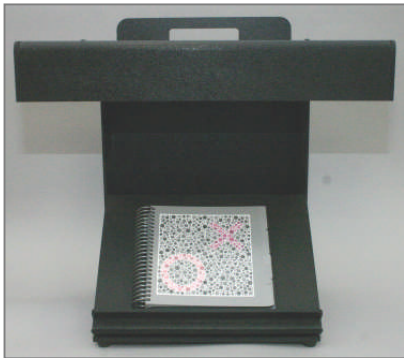
References:

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.Ophthalmol. Proc. Ser.* 52, 425-432

Dain, S.J. and Honson, V.J.(1993) Suitability of Fluorescent tube sources for the Ishihara Test in *Colour Vision Deficiencies XI*, pp. 327-333.



Easel for Pseudoisochromatic Plates

## Illuminator for Pseudoisochromatic Tests with Easel

The Daylight Illuminator provides the proper angle and lighting for testing with Pseudoisochromatic plates. The easel helps avoid damaging fingerprints on the plates because the plates are presented standing on their own. The easel is removable for installation of a Flat Tray in order to use the Illuminator with arrangement tests.

The new Daylight Illuminator with Universal Power Supply adapts to any combination of 50 or 60 Hz and 110 or 220 volt. Kit includes slip in plug adapters for US, UK and Germany. Has UL, CSA and CE markings.

**5137R Illuminator with removable easel 110V**

**5735R Illuminator with removable Easel 110/220V Universal PS**



Flat Tray for FD15C and F100R

## Illuminators for Arrangement Tests

The 100 Hue Flat Tray is specifically designed to be used with Farnsworth 100 Hue, Farnsworth D15 and Lanthony Desaturated D15 tests. The 100 Hue tray is removable and measures 22" by 6" (108 by 30 cm). The raised Tray for the Magnetic Farnsworth or Roth 28 tests is 10 x 18 x 1.75 inch (26 x 46 x 3.5 cm) and includes a black rubber dull mat. See above description of 110/220V Universal Power Supply version.

**5139R Illuminator with removable Flat Tray 110V**

**5733R Illuminator with removable Flat Tray for Universal PS 110/220V**

**6123R Illuminator with Platform for Magnetic Farns or Roth 28 110V**

**6124R Illuminator with Platform for Mag Farns or Roth 28 110/220V**



Illuminator Platform for Mag Farns

## Accessories for Daylight Illuminators

The Daylight Bulbs are 15 watts. What is different about these bulbs is that they provide 6280K daylight which is what is required for accurate color vision testing.

**5141R Easel for use with Pseudoisochromatic Plate tests**

**5142R Flat Tray for mounting in place of removable Easel**

**6122 Illuminator Platform for Magnetic Farnsworth or Roth 28**

**6665R Daylight 18 inch Replacement Bulb**

## Daylight Illuminator Common Features

Each Daylight Illuminator Includes convenient handle for ease of transport, light switch and 4 ft cord. Dimensions are 17.5" high, 10" deep and 19" wide (44.5 cm H x 25.4 cm D x 48.3 cm W). The Plug Adapter kit provides 4 plug adapters (see photo) which includes adapters for:

- Type G for United Kingdom, Ireland, Cyprus, Malta, Malaysia, Singapore and Hong Kong
- Type F and C for Germany, Austria, the Netherlands, Sweden, Norway, Finland, Portugal, Spain, Brazil, Argentina, Peru and Eastern Europe
- Type H and I for Israel, Australia, New Zealand, Papua New Guinea and Argentina
- Type A for North and Central America, Brazil, Peru

The power supply handle power inputs: 47 to 63 HZ and 100 to 240 volts. The Universal Power Supply version is designed for shipment outside of the U.S.



Power Supply and choice of Plugs

Note: 5141R Easel and 5142R Flat Tray come with Velcro™ for easy mounting. 5142R Flat Tray is