

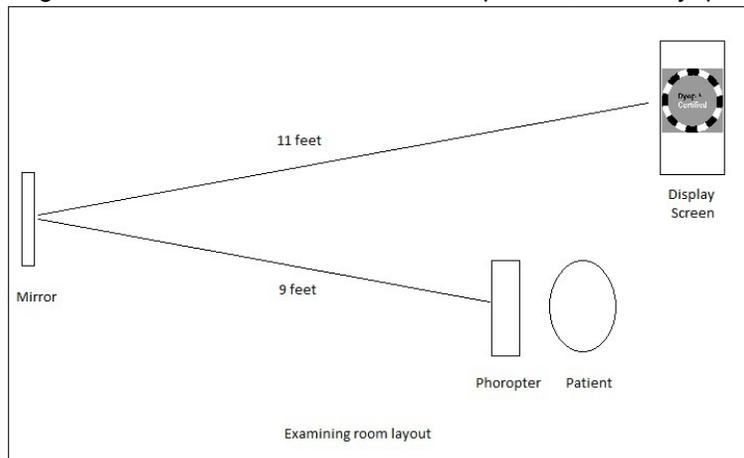
Dyop™ Test - Implementation Program and Guidelines

Allan Hytowitz
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Animated Vision Associates LLC (AVA) has developed a revolutionary method for determining visual clarity and refraction using a rotating optotype called a Dyop™ (short for dynamic optotype). A Dyop™ is potentially more precise in determining visual clarity and refraction end points as Snellen optotypes, potentially faster to use, and does not require literacy to determine visual clarity. The combination of the calibrated arc width diameter, calibrated segment/gap stroke width, circumferential rotation speed, image intensity, and color and contrast of the Dyop™ segment/gaps utilize the pixelized photoreceptor refresh rate to create a more precise indicator of visual clarity and refraction. The calibrated Dyop™ images are intended as a global replacement for both the Snellen and Landolt optotype images.

The use of Dyops™ as an optotype has the potential advantage in that it lets the patient more clearly determine the refraction end point, uses virtually any computer system to display the optotype images, and does not need the constant replacement of light bulbs typical of a projection system. Using a Dyop™ image for refraction needs only a computer monitor situated at approximately a virtual 20 foot viewing distance from the phoropter (and patient). That monitor may be a laptop or a monitor attached to a desktop computer. The prototype Dyop™ Refraction Tests are currently configured for 15 inch, 17 inch, 19 inch, and 22 inch diagonal monitors, however the calibrated diameters of the refraction images are further customizable by adjusting the web browser used to view those images.

The simplest method to create that 20 foot virtual viewing distance is to utilize a mirror 9 feet in front of the patient displaying Dyop™ images which are reflections of the images on a monitor situated 2 feet behind the patient. The calibration of the Dyop™ images is achieved by selecting the appropriate monitor size from the menu of monitor sizes and, if needed, modifying the size of the web browser used to display those Dyop™ images to match the built-in calibration scale. For convenient comparison to Snellen images the current Dyop™ Refraction Test also has a built-in option of using correctly sized Snellen and Landolt optotypes. A shelf may be implemented below the current projection screen so that the laptop screen can be used to display the optotype images instead of the previous projected images. The Snellen images may be displayed as direct images (for viewing without a mirror at an actually 20 foot distance) or as mirror images with use with a mirror and the virtual 20 foot viewing distance. The Landolt images are scaled identically to the Snellen images with the option of a second set of those images being displayed in an incrementally scaled format to compare them with the incremental scaled format of Dyops™. The integration of the appropriate Snellen images are for ease of clinical comparison, and the appropriate Landolt images are for the ease of academic comparison, to the Dyop™ Refraction Test.



Unlike the typical Snellen "end point" question of "Are the letters less/more clear (or less/more blurry)?" with the acuity end point of the patient being able to clearly identify out of three of five letter images, the Dyop™ "end point" question is "How many (Dyop™) images are clearly seen rotating?" Dyop™ images that are only "twinkling" are NOT clearly rotating. The number of clearly seen rotating images in each test panel (because of the precise incremental scaling of the images) directly indicates the Threshold Distance and the diopter adjustment necessary to achieve 20/20 clarity (acuity). After proper adjustment for spherical measurements to an approximate 20/20 clarity (acuity), the patient next views an appropriate

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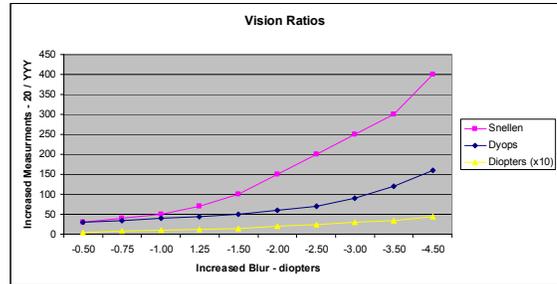
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Dyop™ Refraction Range for the “18 to 21” Threshold Distance or adjacent Threshold Range (such as the slightly larger “21 to 25” foot Threshold Distance) such that at least three of the Threshold Distance images are clearly seen rotating. At the appropriate Threshold Range, an increase or decrease in power (or blur), or the +/- adjustment of cylinder or axis will decrease, rather than increase, the number of Dyop™ images that are clearly seen rotating. The clarity end point is when the maximum (optimum) number of Dyop™ images can clearly be seen rotating.

Dyop™ increased optotype precision also allows refraction be done without the need for auto-refractor prescreening with the caveat that Dyop™ ratios are more precise and “lower” than Snellen/Landolt ratios.

Dyop™ Fraction	Snellen Fraction	Diopters of Refraction
20/30	20 / 30	- 0.50
20/35	20 / 40	- 0.75
20/40	20 / 50	- 1.00
20/45	20 / 70	- 1.25
20/50	20 / 100	- 1.50
20/60	20 / 150	- 2.00
20/70	20 / 200	- 2.50
20/90	20 / 250	- 3.00
20/120	20 / 300	- 3.50
20/160	20 / 400	- 4.50

(This is preliminary prototype data.)



It is anticipated that a commercial version of the Dyop™ Refraction Test will be available by September 1, 2012, and no later than January 1, 2013. To facilitate the adaptation and implementation of Dyops™, the prototype Dyop™ Refraction Test will be provided at no charge along with whatever reasonable telephone and internet support as needed. It is also expected that eye care professionals using the prototype Dyop™ Refraction Test will share their observations and results as to the relative precision, efficiency, and utility of the tests with Animated Vision Associates. The prototype Dyop™ Refraction Test has a three month expiration date, which may be renewed as needed for evaluation purposes, whereas the commercial version of the Dyop™ Refraction Test has a 12 month license. It is understood that Animated Vision Associates will not have any liability for the lack of delivery of the acuity test products beyond a refund of the cost of the license fees.

Also available are consumer versions of the Dyop™ tests which will remain available on-line free of charge at <http://www.dyop.org/> including:

1. A Dyop™ Visual Acuity Test for use at 10 feet from your monitor at <http://www.dyop.org/personal.htm>, with the specific test at <http://www.dyop.org/documents/DyopAcuity.html>
2. A 30 second Dyop™ Acuity Screening Test (for Infants and Children) at <http://www.dyop.org/Junior.htm>, with the specific test at http://www.dyop.org/documents/DyopAcuity_Screening.html
3. A 10 second Dyop™ Color Contrast Test (and possible dyslexia screening test) at <http://www.dyop.org/color.htm>, with the specific test at <http://www.dyop.org/documents/ColorScreening.swf>.

These consumer tests are intended to educate patients, to eventually have the webpage direct patients to Dyop™ Certified Vision Care Practitioners, and to be used in the practitioners' office to assist their patients in realizing the need for properly refracted lenses.

For additional details or assistance, contact:

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