



**Dyop® Test
Implementation Guidelines
www.dyopvision.com**



A Dyop® (short for dynamic optotype) is a uniformly rotating/moving, segmented circular visual stimulus (optotype) used to rapidly determine visual acuity and refraction end-points. The perception of motion by the Dyop® gap/segments provides a precise strobic visual stimulus. A Dyop® is faster to use than classic letter-based (Snellen/Sloan/Landolt) tests, minimizes image memorization, is more accurate and more consistent, does not require literacy (or the ability to read, let alone read English), reduces image fixation and over-minused refractions, and provides a precise measurement of visual acuity regardless of literacy, age, language, or culture.

The evaluation Dyop® Refraction Test is available free to eye care professionals at <http://www.dyop.org/professional.htm> and <http://www.dyop.org/documents/DyopRefraction.html> along with reasonable telephone and internet support.

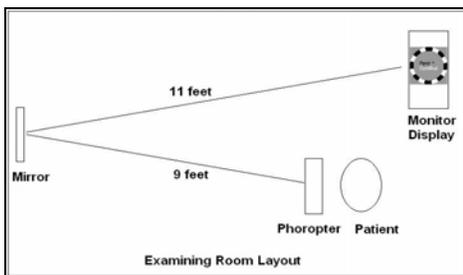
A Dyop® test has the advantage of being able to be used with virtually any computer web browser, laptop, or tablet to precisely determine the acuity threshold, and refraction end point. Tablet & SmartPhone images are for near-vision refraction.

The desired 20 foot Dyop® Viewing Distance may be achieved by using a mirror 9 feet in front of the patient (and phoropter) displaying reflected Dyop® s from a monitor situated 2 feet behind the patient. Dyop® rotation can be reversed to test for false positives using the reversal toggle button, individual Dyop® images start/stopped using those toggle buttons, or using the keyboard controls. The opposing rotation of the Dyop® images minimizes rotational resonance. The tests may be configured for virtually any computer operating system, monitor size, or virtual viewing distance in the examination lane. If a previous projection system is still desired, a shelf may be placed below the projection screen so that the screen of a laptop may be raised to display the Dyop images instead of the projected images.

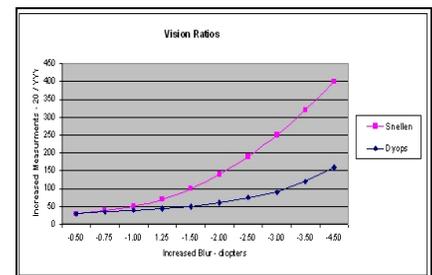
Use the mouse scroll wheel or up/down arrows to adjust the Dyop® diameter (arc width) to determine the smallest diameter Dyop® that can be detected as rotating. The acuity endpoint is the smallest angular arc width Dyop® diameter when the patient can still detect only the Dyop® images rotating. The refraction endpoint for the Snellen/Landolt tests typically is found by asking the patient, "Are the letters (optotypes) less/more clear?" (Or "less/more blurry?"), and usually has the patient attempting to identify three out of five letters (or optotypes) on the acuity endpoint line. The Dyop® refraction endpoint is determined by asking the patient "Can you detect the rotating images?" Dyop® images that merely "twinkle" are NOT ROTATING.

The major advantage of Dyop® refraction and acuity testing is in simplifying the bracketing process. The objective of a refraction and acuity measurement is to reduce the Dyop® Aided Acuity (DAA) Index Number (and angular arc width) as much as possible. The Best Dyop® Aided Acuity (BDAA) Index Number is the optimum setting for the sphere, cylinder, and axis as determined by the smallest angular arc width (diameter) for a Dyop® detected as moving. When a refractive lens is over or under minused, or when the axis vector is misaligned, those less-than-optimum settings increase the DAA and minimum angular width of the motion detected Dyop®. Once the Best Dyop® Aided Acuity (BDAA) Index Number is determined for the right eye, repeat the refraction process for the left eye, and then binocularly.

Note that Low Vision patients will have a lower Dyop® fraction ratio than the Snellen fraction ratio due to increased Dyop® precision. (See chart below.)



| 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 / 140 | -2.00 |
| 20/75 | 20 / 200 | -2.50 |
| 20/90 | 20 / 250 | -3.00 |
| 20/120 | 20 / 320 | -3.50 |
| 20/160 | 20 / 400 | -4.50 |



Office Layout for a 20 foot Viewing Distance

Prototype Refraction Data -

The Dyop® consumer tests (Acuity, Infant Acuity, Color Contrast, etc.) are intended to educate patients and will remain available on-line free-of-charge at <http://www.dyop.org>. Once we have partnered with providers, the Dyop® Acuity test webpage direct patients to Dyop® Certified Vision Care Practitioners.

For additional details or assistance, contact:

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