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# EyeKinetix®



## EyeKinetix® Objective Binocular Pupillometer

Checking pupils for an RAPD is an important part of the comprehensive eye exam, and is recommended in the AAO's Preferred Practice Patterns® for POAG suspects and patients, however the swinging flashlight method is difficult for humans to do well, and even more difficult and time consuming to accurately quantify.

Importantly, there is evidence that even subtle RAPDs may be clinically significant. EyeKinetix® makes it easy to accurately and objectively assess RAPDs and physiological anisocoria.

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## Clinical Applications

\*Routine eye exams glaucoma suspects and patients

3rd cranial nerve palsies

Optic nerve, retinal or cerebral vascular disease, tumors, amblyopia

Multi-focal lens fittings

\*Pupil testing is recommended by the AAO and AOA for POAG suspects and patients

EyeKinetix® is not cleared for the specific diagnosis of any condition.



## Clinical Benefits

May aid in the detection of vision or even life-threatening disorders

Accurately measure and document physiological anisocoria

Objective: improve your confidence in routine and subtle RAPD assessment

Detailed, objectively quantified documentation of the presence or absence of an RAPD



## Regulatory

FDA Listed | **CPT Code 95919**

Health Canada Licensed

## A 21st century alternative to a 19th century test

**Konan Medical has been dedicated to advancing objective binocular pupillary testing technology for ophthalmology and optometry for over a decade**

The EyeKinetix® pupillometer utilizes high-definition video cameras under infrared conditions to record the bilateral pupil responses to monocular visual stimuli.

Unlike human observers that only see one pupil reflex at a time, EyeKinetix® simultaneously records both direct and consensual pupillary light reflexes.

Easy, objective, quantitative, delegated, reimbursable; an order of magnitude more detailed than the finest human observer.

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## Relative Afferent Pupillary Defect (APD/RAPD)

The APD is a measure of asymmetry which may occur with optic nerve, retinal, or cerebral vascular disease, and amblyopia, specifically when the

disease or disorder is presenting asymmetrically. Pupil testing is a required part of a comprehensive eye examination, historically performed as a subjective observation (SFM), and considered by many clinicians as difficult to perform well.

## Examples of disorders that may cause an APD:

- Glaucoma
- Amblyopia
- Optic neuritis / MS
- Optic nerve tumor
- Optic nerve infections or inflammation
- 3rd cranial nerve palsies
- Retinal detachment
- Intraocular tumor
- Retinal infection
- Alzheimer's
- Autism
- Brain tumors
- Parkinson's
- Traumatic optic neuropathy

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## Visibility of Pupils Through Grey Absorptive Lenses

This simulation demonstrates how the pupils become difficult to see when neutral density filters are used to quantify an APD.

Note that an APD of 0.3 light log units, which is considered subtle, means the affected eye 'sees' 50% less light than the unaffected eye.

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Optical Density (Light Log Units)	Transmission %	Absorption %	Approximate Grayscale
0.3	50	50	
0.6	25	75	
0.9	12	88	
1.2	6	94	
1.5	3	97	



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# The RAPDx® Test

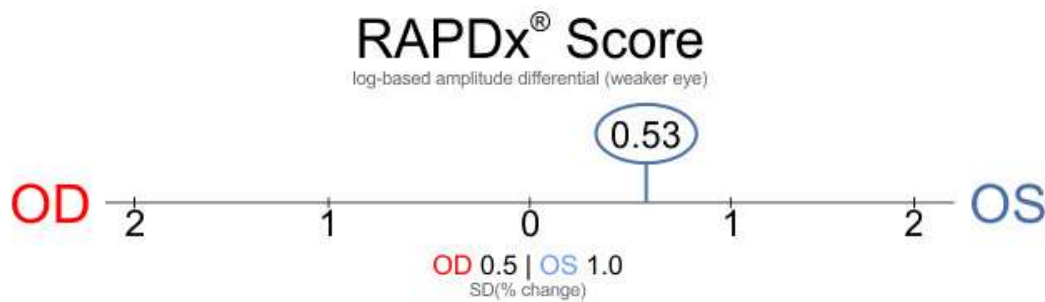
A differential assessment of the mean of the right eye stimulated responses versus the mean of the left eye stimulated responses are compiled as the “RAPDx® Score”.

The RAPDx® score illustrated here indicates that the left eye sees less light (i.e. has the weaker response) and the averaged score is recorded as 0.53



(constriction amplitude differential) in this example.

Assessed independently as being comparable to the swinging flashlight method when quantified using neutral density filters.



*NOTE: Pharmaceutical agents including prescribed, OTC, recreational drugs and abused substances, as expected, may affect pupil reflexes and their measures.*

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## Scotopic-Photopic Pupil Measurements + IPD

The low-high luminance test for pupil sizes is intended to document pupil sizes from very low light to bright conditions as approximate scotopic and photopic conditions.

Pupil dimensions, inclusive of asymmetry of pupil sizes can be helpful for functional pupil assessment, as well helping provide better understanding the contributions of optic zone dimensions in refractive surgery and complex multifocal IOL and contact lens selection.

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Clinical and Scientific Publications

Frequently Asked Questions

Testimonials

# **Scientific and Clinical Publications**

## **Effects of Age and Sex on Values Obtained by RAPDx® Pupillometer, and Determined the Standard Values for Detecting Relative Afferent Pupillary Defect**

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Satou, Tsukasa, et al. "Effects of age and sex on values obtained by RAPDx® pupillometer, and determined the standard values for detecting relative afferent pupillary defect." *Translational Vision Science & Technology* 5.2 (2016): 18-18.

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## **Correlation Between Inter-Eye Difference in Average Retinal Nerve Fiber Layer Thickness and Afferent Pupillary Response as Measured by an Automated Pupillometer in Glaucoma**

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Sarezky, Daniel, et al. "Correlation between inter-eye difference in average retinal nerve fiber layer thickness and afferent pupillary response as measured by an automated pupillometer in glaucoma." *Journal of Glaucoma* 25.3 (2016): 312-316.

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## **Correlation Between Intereye Difference in Visual Field Mean Deviation Values and Relative Afferent Pupillary Response as Measured by an Automated Pupillometer in Subjects with Glaucoma**

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Sarezky, Daniel, et al. "Correlation between intereye difference in visual field mean deviation values and relative afferent pupillary response as measured by an automated pupillometer in subjects with glaucoma." *Journal of Glaucoma* 23.7 (2014): 419-423.

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## **Pupil-based detection of asymmetric glaucomatous damage – comparison of the Konan RAPDx® pupillograph, swinging flashlight method, and magnifier-assisted swinging flashlight method**

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Ali, Mohsin, et al. "Pupil-based detection of asymmetric glaucomatous damage-comparison of the Konan RAPDx® pupillograph, swinging flashlight method, and magnifier-assisted swinging flashlight method." *Investigative Ophthalmology & Visual Science* 54.15 (2013): 4811-4811.

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## **Symmetry of the pupillary light reflex and its relationship to retinal nerve fiber layer thickness and visual field defect**

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Chang, Dolly S., et al. "Symmetry of the pupillary light reflex and its relationship to retinal nerve fiber layer thickness and visual field defect." Investigative ophthalmology & visual science 54.8 (2013): 5596-5601.

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## **Accuracy of pupil assessment for the detection of glaucoma: a systematic review and meta-analysis**

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Chang, Dolly S., et al. "Accuracy of pupil assessment for the detection of glaucoma: a systematic review and meta-analysis." Ophthalmology 120.11 (2013): 2217-2225.

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## **A novel computerized portable pupillometer detects and quantifies relative afferent pupillary defects**

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Cohen, Liza M., et al. "A novel computerized portable pupillometer detects and quantifies relative afferent pupillary defects." Current eye research 40.11 (2015): 1120-1127.

[Read Full Article](#)

## **Estimation of Retinal Ganglion Cell Loss in Glaucomatous Eyes With a Relative Afferent Pupillary Defect**

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Tatham, Andrew J., et al. "Estimation of retinal ganglion cell loss in glaucomatous eyes with a relative afferent pupillary defect." Investigative Ophthalmology & Visual Science 55.1 (2014): 513-522.

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## Unilateral periodic pupillary constriction causing alternating anisocoria

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Conrad, Erin C., et al. "Unilateral periodic pupillary constriction causing alternating anisocoria." *Neurology* 90.2 (2018): 86-88.

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## Detecting glaucoma using automated pupillography

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Tatham, Andrew J., et al. "Detecting glaucoma using automated pupillography." *Ophthalmology* 121.6 (2014): 1185-1193.

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## Detecting Glaucoma with Pupillography

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Chang, Dolly S., et al. "Detecting Glaucoma with Pupillography." Investigative Ophthalmology & Visual Science 53.14 (2012): 5621-5621.

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## Pupillographic evaluation of relative afferent pupillary defect in glaucoma patients

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Ozeki, Naoki, et al. "Pupillographic evaluation of relative afferent pupillary defect in glaucoma patients." British Journal of Ophthalmology 97.12 (2013): 1538-1542.

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## What Konan Medical Customers Say



“The RAPDx<sup>®</sup> score provides a highly sensitive and specific assessment of the RAPD compared to the swinging flashlight method. It is easily used by ancillary personnel as part of the screening of patients and is a powerful tool for clinicians needing to identify, confirm and quantify relative afferent pupillary defects.”

**Nicholas J. Volpe, MD**

Chairman, George S. and Edwina Tarry Professor in  
Ophthalmology  
Northwestern University, Feinberg School of Medicine

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 Hours of Operation

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