



NU
CORIA

THE NEXT GENERATION OF **VISUAL FIELD ANALYZER**



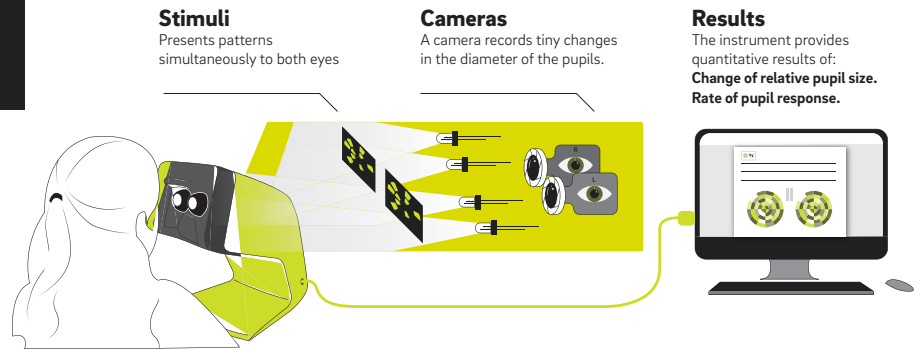
OBJECTIVE DIAGNOSIS OF COMMON EYE DISEASES

The diagnosis and management of retinal and neurological diseases requires functional assessment of the visual fields. Conventional visual field test devices (perimeters) use behavioral responses from patients and suffer from high rates of quality control failures and poor reproducibility. The NuCoria Field Analyzer (nCFA) has been developed over several years by a team at the ANU who have previously commercialised a popular perimeter.

A significant number of papers have been published on the nCFA method, showing its utility in the major blinding diseases and some neurological problems (see attached). The nCFA directly assesses responses of the visual nervous system to provide objective, non-contact, measurement of the visual fields of both eyes concurrently.

HOW IT WORKS

The nCFA uses video recordings of tiny changes in pupil size in response to patented stimuli that are delivered to both eyes at 22 per second. Conventional perimeters only provide information on sensitivity to light at each test position within the visual field map. The nCFA provides information on the both sensitivity (amplitude) and delay of responses.



“ Over 50 individual studies have been conducted ranging from small scale testing (n<20) through to larger scale studies (n>40, 2 repeats) with corresponding normative databases generated from the larger studies. ”

14,000
TOTAL OF VISUAL
FIELDS THAT HAS BEEN
ANALYZED.

The Results

Perimetry is traditionally used in the diagnosis of glaucoma however there is growing evidence that perimetry is important in the diagnosis of retinal diseases such as age-related macular degeneration (AMD) and diabetic retinopathy (DR). Key research by the ANU team has determined that the nCFA can detect early disease effects in AMD and DR patient's eyes before traditional diagnostic tools. Earlier diagnosis enables clinicians to treat patients more effectively with existing therapies and improve patient outcomes.

The nCFA is now at an advanced prototype stage and FDA market approval has been obtained on the basis of substantial equivalence with a marketed perimeter (Class I #K063310).

The IP & Patents

Key intellectual property has been created and protected as appropriate including:

- **patents (6 patent families) relating to the visual stimuli**
- **clinical data and normative database**
- **software**
 - pupil tracking
 - patient record management
- **hardware**
 - product engineering and design specifications
 - regulatory approval dossier and supporting materials
 - user manual

All IP are licensed to NuCoria

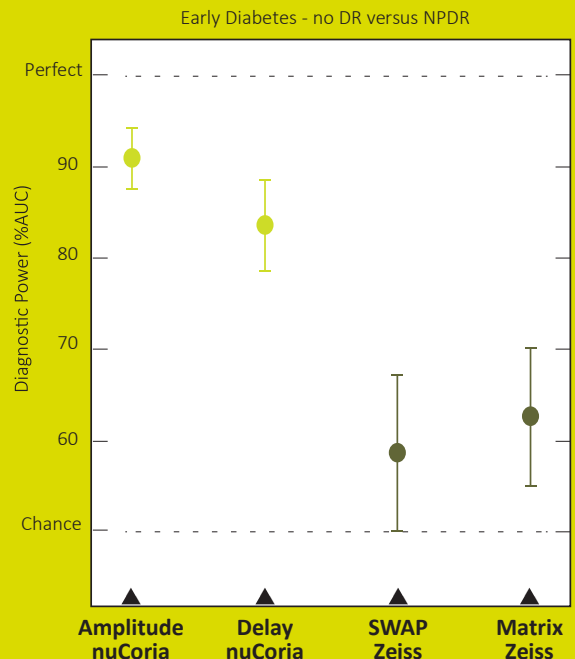
EARLY DIAGNOSIS LEADS TO BETTER TREATMENT DECISIONS AND OUTCOMES

Comparison of non DR patient with NPDR patients

See increased sensitivity with NuCoria Perimeter for detection of very early disease (non-proliferative DR) compared with marketed perimeters



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PUBLICATIONS

Carle CF, James AC, Kolic M, Essex RW, Maddess T.

Luminance and color variant pupillographic perimetry in glaucoma. Clin Exp Ophthalmol 2014;doi: 10.1111/ceo.12346.

Sabeti F, Nolan C, Essex R, Kolic M, James AC.

Multifocal pupillography identifies changes in visual sensitivity according to severity of diabetic retinopathy in type 2 diabetes. IOVS 2014;Submitted.

Sabeti F, Carle CF, Saikal A, Essex RW, James AC, Maddess T.

Multifocal pupillography in early age-related macular degeneration. Opt Vis Sci 2014;91:904-915.

Carle CF, James AC, Maddess T.

The pupillary response to color and luminance variant multifocal stimuli. Invest Ophthalmol Vis Sci 2013;54:467-475.

Maddess T, Kolic M, Essex RW, Carle C, James AC.

High- versus low- density multifocal pupillographic objective perimetry in glaucoma. Clin Exp Ophthalmol 2013;41:140-147.

Sabeti F, Maddess T, Essex RW, James AC.

Dichoptic multifocal pupillography identifies retinal dysfunction in early AMD. Graef's Arch Ophthalmol 2013;251:1707-1716.

James AC, Kolic M, Bedford SM, Maddess T.

Stimulus parameters for multifocal pupillographic objective perimetry. J Glaucoma 2012;21:571-578.

Rosli Y, Bedford SM, James AC, Maddess T.

Photopic and scotopic multifocal pupillographic responses in age-related macular degeneration. Vision Res 2012;69:42-48.

Sabeti F, Maddess T, Essex RW, James AC.

Multifocal pupillography identifies ranibizumab induced changes in retinal function for exudative age-related macular degeneration. Invest Ophthalmol Vis Sci 2012;53:253-260.

Carle CF, James AC, Kolic M, Loh Y, Maddess T.

High resolution multifocal pupillographic objective perimetry in glaucoma. Invest Ophthalmol Vis Sci 2011;52:604-610.

Carle CF, Maddess T, Kolic M, Essex RW, James AC.

Contraction anisocoria: segregation, summation and saturation in the pupil light reflex pathway. Invest Ophthalmol Vis Sci 2011;52:2365-2371.

Sabeti F, James AC, Maddess T.

Spatial and temporal stimulus variants for multifocal pupillography of the central visual field. Vision Research 2011;51:303-310.

Sabeti F, Maddess T, Essex RW, James AC.

Multifocal pupillographic assessment of age-related macular degeneration. Optom Vis Sci 2011;88:1477-1485.

Bell A, James AC, Kolic M, Essex RW, Maddess T.

Dichoptic multifocal pupillography reveals afferent visual field defects in early Type 2 Diabetes. Invest Ophthalmol Vis Sci 2010;51:602-608.

Maddess T, Ho Y-L, Wong SSY, et al.

Multifocal pupillographic perimetry with white and colored stimuli J Glaucoma 2010;20:336-343.

Maddess T, Bedford S, Goh XL, James AC.

Multifocal pupillographic visual field testing in glaucoma. Clin Exp Ophthalmol 2009;30:678-686.

Carle CF, Chain AY, James AC, Kolic M, Maddess T.

Comparing structure and function in multifocal pupillographic objective perimetry (mfPOP) and SAP. World Glaucoma Congress 2013.

Sabeti F, Mallikarjunan R, Nolan C, Carle C, Maddess T, James A.

A comparative analysis of changes in visual field sensitivity in type 2 diabetes. Imaging and Perimetry Society 2014.

Sabeti F, James AC, Essex RW, Maddess T.

Dichoptic multifocal visual evoked potentials identify local retinal dysfunction in age-related macular degeneration. Doc Ophthalmol 2013;126:125-126.

Ruseckaite R, Maddess T, Danta G, Lueck C, James AC.

Sparse multifocal stimuli for the detection of multiple sclerosis. Annal Neurology 2005;57:904-913.

Ali EN, Maddess T, James AC, Voicu C, Lueck CJ.

Pupillary response to sparse multifocal stimuli in multiple sclerosis patients. Multiple Sclerosis Journal 2014;20:854-861.

Ali EN, Maddess T, Carle CF, Lueck CJ.

Effects of stimulating melanopsin-containing retinal ganglion cells in migraine patients using multifocal objective pupillometry: A randomized controlled cross over study. Cephalalgia 2014;Submitted.