Objective Perimetry in Glaucoma Patients Using Chromatic Pupilloperimetry

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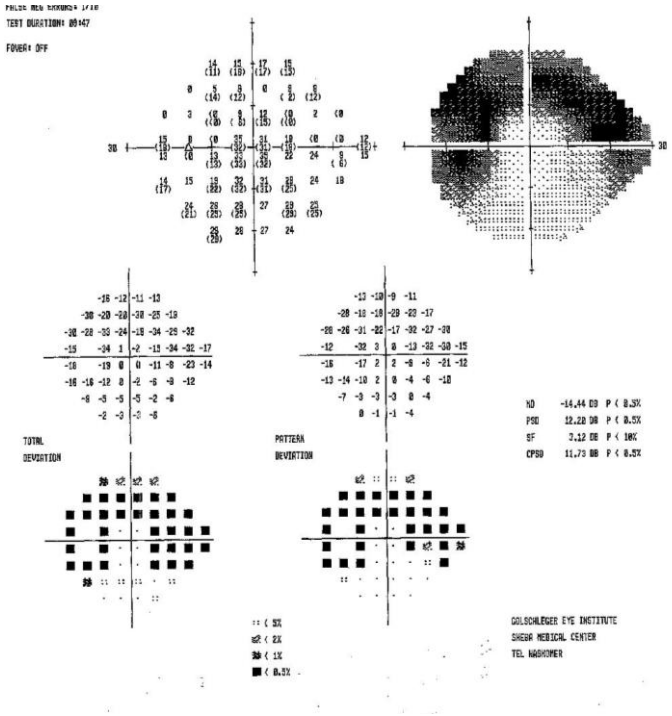
Glaucoma

- Ocular disease causing damage to the optic nerve.
- The main risk factor is increase intraocular pressure.
- Usually present as progressive damage to the peripheral visual field – tunnel vision.

Perimetry – Visual field testing

- Visual field (VF) testing is part of the current clinical standard for evaluating retinal degeneration and optic nerve damage
- The most common test is Humphrey automated perimetry.
- The tests is subjective and depends heavily on the patient.

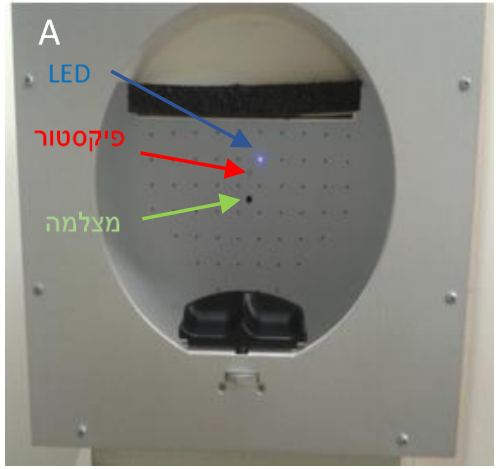


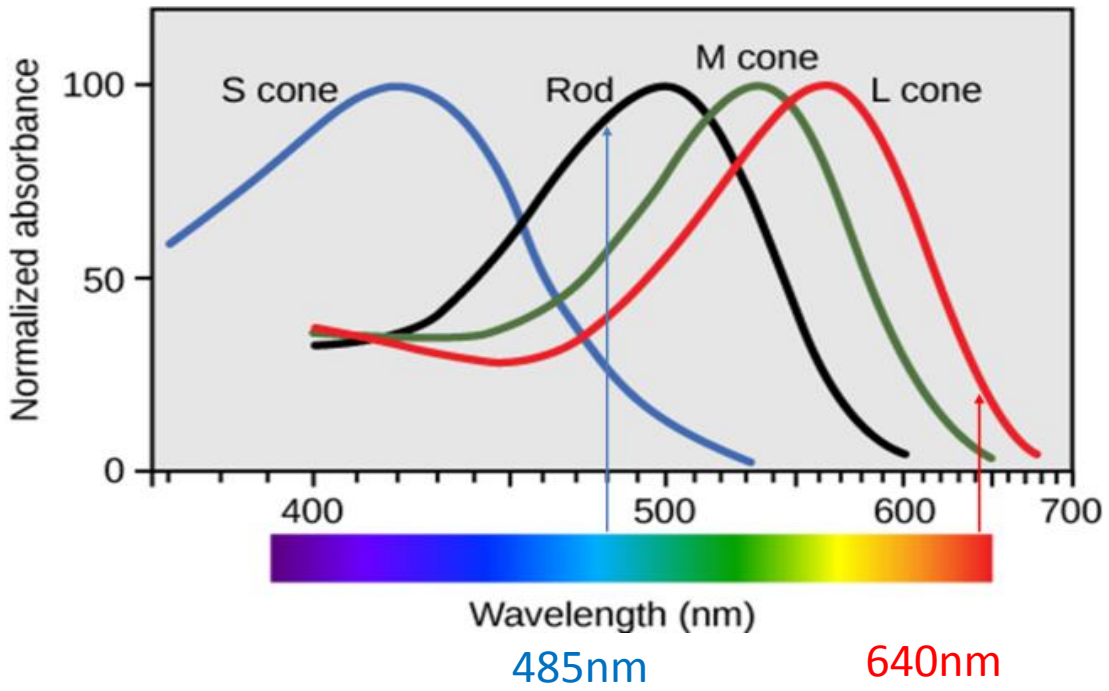
Limitations of subjective perimetry

- Relies on patient cooperation and attention
- Affected by patient's communication skills, attention, fatigue etc.
- Stressful for patients that need to make conscious decisions in identifying the stimuli.
- Test-retest variability. In particular in peripheral locations and areas with VF defects.

Perimetry based on pupillary light reflex to focal chromatic stimuli

- ✓ Objective
- ✓ Informative
- ✓ Applicable to various pathologies and patients

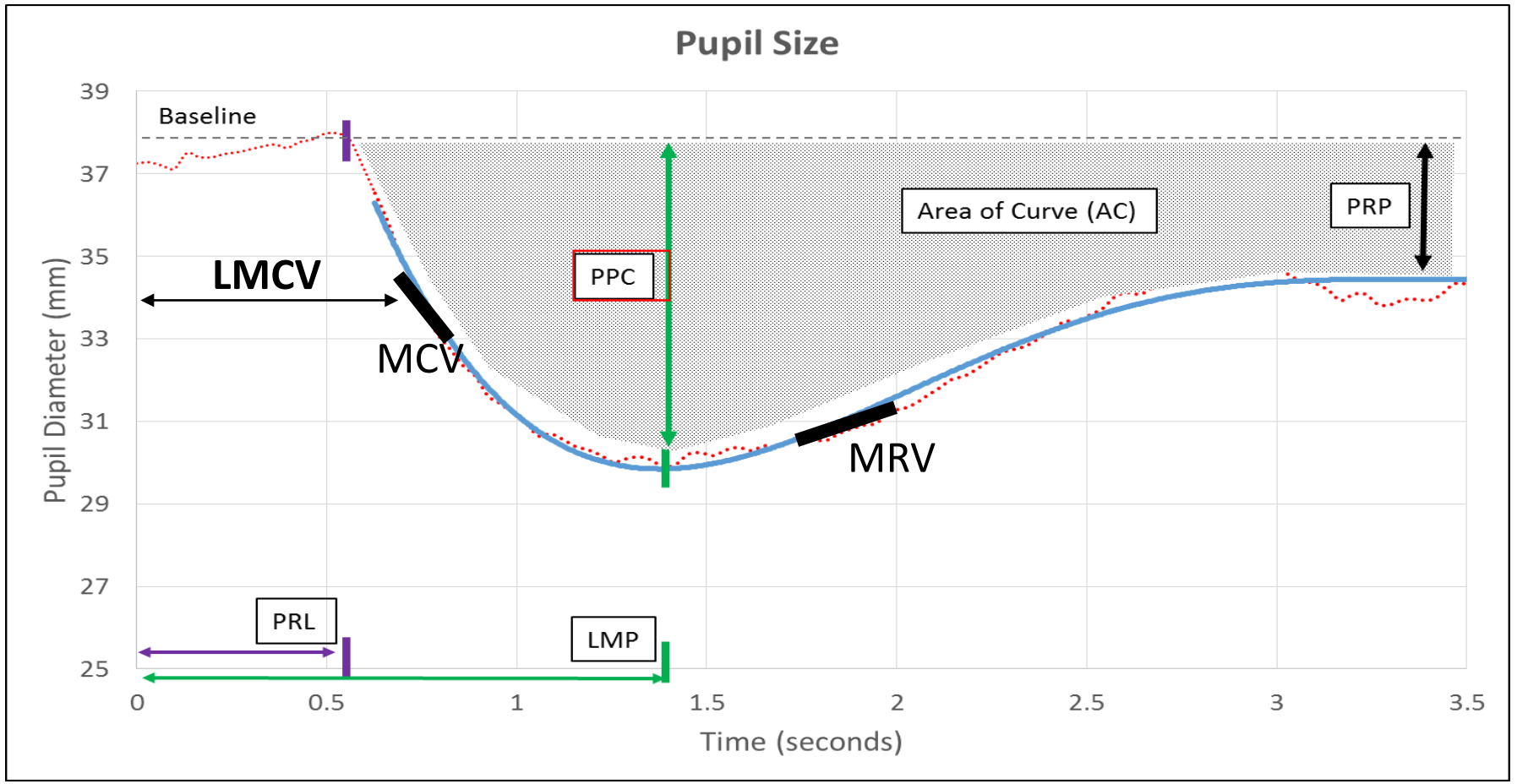




Cell Type	Stimulus
Cones	Low-intensity red (624nm)
Rods	Low-intensity blue (485 nm)
ipRGCs (melanopsin)	**High intensity blue (485 nm)**

Perimetry based on pupillary light reflex to focal chromatic stimuli

Pupillary responses – >30 parameters



- **PPC** - % pupil contraction
- **LMCV** – Latency of maximal contraction velocity
- **MCV** - Maximal contraction velocity
- **MRV** - Maximal relaxation velocity

Aim of the study

- To assess for the first time changes in pupil responses to focal light stimuli presented at different locations of the VF in Glaucoma patients.

Study design

- **Type of study**: Cross-sectional – assessing exposure and outcome in the population at a specific point in time
- **Exposure** : The disease (Glaucoma)
- **Outcome:** The pupil response to light

- 20 Glaucoma patients
- 20 healthy age-matched volunteers
- Humphrey 24-2 perimetry (SITA standard)
- The pupillary responses of patients will be compared with the pupillary responses of control subjects.
- Results of patients will be compared with their findings on Humphrey

Sample size:

- This is an exploratory research and a pilot study assessing the pupillary responses of glaucoma patients for focal chromatic light stimuli for the first time.

- The aim is to get preliminary results in order to asses if there are any differences between the groups.

- We plan to follow Rothman's approach[1] and are not planning to correct for multiple comparisons as we want to avoid missing a possible effect.

- 1. Rothman KJ. No adjustments are needed for multiple comparisons. Epidemiology. 1990;1(1):43-46.