Vision Monitor

Dark and light adaptation

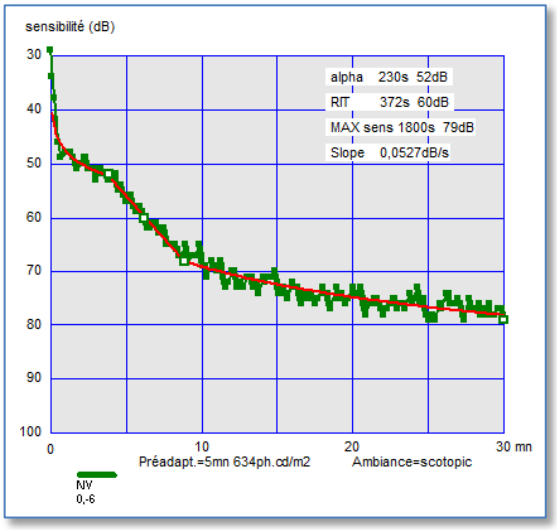
Introduction

The purpose of this program is to evaluate the adaptability of the patient to different lighting environments.
It includes:
- the measurement of dark adaptation after light bleaching,
- the measurement of the sensitivity threshold with ganzfeld stimulations after adaptation to darkness (scotopic FST test) or adaptation to light (photopic FST test),
- the measurement of the ability to tolerate light (photoaversion test or PAT).

These examinations present many clinical indications:
- the functional assessment of disorders of the ocular apparatus (retinitis pigmentosa,..), responses can often still be obtained with the psychophysical examination of dark adaptation when the ERG is extinguished,
- suspicions of metabolic deficit (vitamin A deficiency),
- the functional assessment of people performing nocturnal activity,
- the evaluation of subjects who complain of difficulty seeing at night,
- the early detection of pathologies such as age-related macular degeneration.

On MonCvONE devices, this examination can be performed with local stimulation (size V Goldmann) or with full field (ganzfeld).
On the other devices (MonPackONE, MonColor), the tests are performed only with ganzfeld stimulation.

Dark adaptation after light bleaching



This examination allows the study of the dynamics of recovery of sensitivity to light after light bleaching. It begins with a 2 to 5-minute bleaching performed in ganzfeld (full-field) conditions. The patient is then placed in total darkness and presented with tests with the task of pressing the response bulb as soon as he perceives them. The test luminance is reduced when the patient responds; otherwise, it is increased. The first part of the curve corresponds to the recovery of the cones and is followed by that of the rods.
The result analysis determines the alpha point (breaking point between the recovery of the cones and that of the rods), the time necessary to have a start of recovery of the rods (rod intercept time or RIT) and the maximum level of sensitivity reached over the course of the exam.

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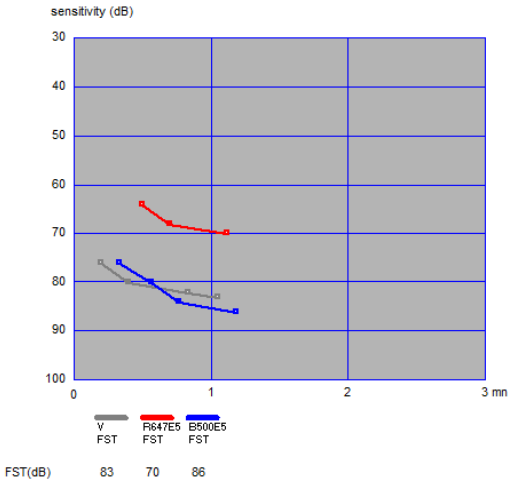
Full field stimulus threshold (FST)



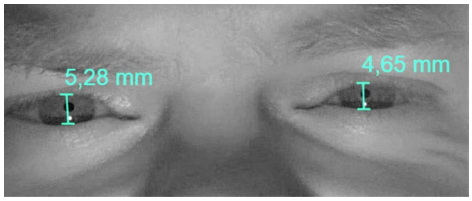
This examination consists of measuring the thresholds of light sensitivity after dark adaptation (scotopic FST) or light adaptation (photopic FST).

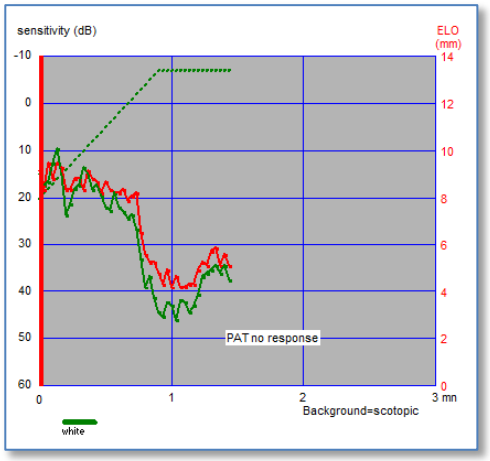
Thresholds are measured with an 8-4-2-1 staircase strategy, the patient having to press the response button when perceiving light stimulations. The tests can be white or with red and blue colors, to assess whether the response is mediated by cone or rod photoreceptors.

The use of full-field stimulation allows the examination of subjects with fixation difficulties (central scotoma, nystagmus, etc.). For a more detailed analysis of the retina, local tests can also be performed on the MonCvONE-CR perimeter using dark adapted chromatic perimetry.

The FST test is available on Metrovision's MonCvONE and MonColor devices.

Photoaversion threshold (PAT)





The luminance of the test increases gradually, in steps of 1 dB, the patient having to press the response button when he/she finds the level of light uncomfortable. The test is repeated several times for a pre-programmed duration and the final threshold is the average of the responses.
The video is recorded throughout the duration of the examination and the eye lid opening measured from this video. The final result (left) shows the change in luminance (dotted line) and the changes in eye lid opening for the right (red line) and left eye (green line). The pupil diameter can also be recorded in synchrony.

The PAT test is available on the MonCvONE and MonColor devices.

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Technical specifications

	MonCV One	MonColor	MonPack One
Luminance of the bleaching phase	Programmable up to 1400 cd/m2	Programmable up to 3660 cd/m2	810 cd/m2
Stimulus color	Programmable	Programmable	Programmable
Type of stimulus	Spot size V or ganzfeld	Ganzfeld	Ganzfeld
FST test	YES	YES	NO
Photoaversion test	YES	YES	NO

Sensory threshold measurements can be displayed in decibels (dB) with reference to 318 photopic cd/m2 or, alternatively, in log photopic cd /m2 or in log photopic trolands (when pupil size is recorded)

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