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Nystagmus module

PRODUCT INSIGHTS

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This document provides a comprehensive overview of how to perform Nystagmus tests using the NYSTALYZE system in conjunction with the SYNAPSYS VNG software. Unique for its adaptability, NYSTALYZE offers both a wireless mask and a wired version, catering to the diverse needs and preferences of users.

GENERAL CONCEPTS ABOUT NYSTAGMUS

The clinical vestibular examination consists mainly of the search for spontaneous Ny, evoked Ny (by eccentric gaze-rebound-vibration-pressure-sound-hyperventilation), position, positioning Ny, and rapid shaking of the head (Head Shaking Test). For each type of Ny, the following must be considered: direction and toward, duration, course, velocity, and waveform of the slow phase, as well as inhibition effect by the fixation.

In particular, NYSTALYZE system recording allows an exact measurement of the velocity of the Ny, however small it may be if the specific manual tool is used. It also allows you to easily follow the development of the slow phase velocity curves, thus making it possible to correctly describe the duration and course of the Ny themselves (distinction between transient and persistent responses, between stationary and paroxysmal responses) and to quantify immediately the inhibitory effect of fixation.

It is useful to remember that:

- The absence of spontaneous-positional Ny, observed in static conditions, does not guarantee the absence of preponderance observed in dynamic conditions. Even if a preponderance is not detected during the rotatory tests, there is no certainty that it cannot appears during the thermal tests in relation to the different position of the head in the space and to the different frequency of stimulation of the labyrinth carried out by each type of test. and obviously vice versa.
- The absence of spontaneous-positional Ny does not guarantee the absence of a hypovalence.
- If there is a spontaneous-positional Ny then not only does the preponderance have the same direction and the same direction but also its intensity is much higher the greater is that of the thermal or rotational stimulation that generates it.

PATIENT INSTRUCTIONS ABOUT NYSTAGMUS

Before starting the exam with NYSTALYZE system it is necessary to provide some simple instructions to the patient. Do not move the head. Avoid any head tilt, pitch, roll before and during the test. Keep your eyes wide open. Avoid blinking. Maintain your eyes centred unless specifically requested. Try to keep your mind occupied with a flow of thoughts.

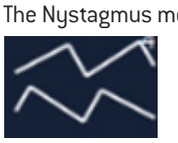
INTERPRETATION OF NYSTAGMUS TEST

This paragraph describes the specific features of the Nystagmus tests.

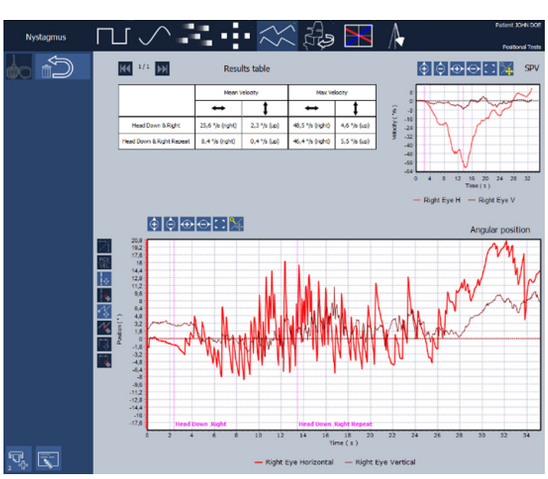
- Start input.
- Add a marker at each key moment in the test (change of position of patient, stopping of head movements during head shaking test and so on).
- The velocity graph can help adapt the recording time according to the rise or fall of the velocity curves. It is in fact very important to distinguish between of transient and permanent nystagmus, and it is very difficult to estimate the average velocity variations if only the record of the eye position is available.
- Stop input.

GENERAL PRESENTATION OF NYSTAGMUS MODULE

The Nystagmus module is represented by the icon.



This module preferentially allows recording and analysis of spontaneous and position nystagmus, preparing for these the horizontal and vertical components and the real-time changes in the slow phase velocities for optimal observation and description.



AVAILABLE TESTS

Following tests are available in the Nystagmus module with NYSTALYZE system

Test name	Description
Spontaneous	Test with predefined markers to be manually inserted.
Positional Tests	Test with predefined markers to be manually inserted.
Dix-Hallpike test	Test with predefined markers to be manually inserted.
HF Head Shake	Test with predefined markers to be manually inserted.
Open 1- 12	Blank customizable tests.

The “open 1-12” option provides the possibility to customize tests for the user by accessing the settings.

STIMULATION PARAMETERS

In this module, no stimulation is generated by the software.

So NYSTALYZE system, on the other hand, will help you to specify your conditions of protocol and this associate the corresponding results with each stage of your protocol.

Each recording may be divided into zones of greater or lesser length, the separation of these zones being indicated by a marker (dotted fuchsia vertical line). Each zone shows the label of the marker located at the start of the zone. These labels provide a brief description of the elements of your protocol.

They may be pre-defined upstream if the protocol is known in advance.

They may also easily be inserted at the end of the recording.

If the protocol is pre-defined, the successive previously established labels can then be entered automatically

during the input process by pressing the "insert" key or using the remote command at each change in the sequence.

SETTING DEFAULT TEST

In this module, there is no setting default.

DISPLAY OF RESULTS

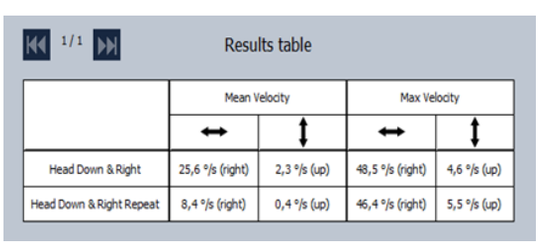
The results are displayed in a results table and in the slow phase velocity graph.

The results displayed correspond to the zone displayed in the position graph. In other words, only the part of the position graph is taken into account for the purpose of constructing the slow phase velocity graph and results table.

POSITION GRAPH

The position graph shows the horizontal and vertical components of the nystagmus.

RESULTS TABLE



	Mean Velocity		Max Velocity	
	↔	↕	↔	↕
Head Down & Right	25,6 °/s (right)	2,3 °/s (up)	48,5 °/s (right)	4,6 °/s (up)
Head Down & Right Repeat	8,4 °/s (right)	0,4 °/s (up)	46,4 °/s (right)	5,5 °/s (up)

↔	Horizontal
↕	Vertical
Mean velocity	Average slow phase velocity measured on the zone
Maximum velocity	Maximum slow phase velocity measured on the zone

The results table shows one line for each zone located between two markers and lasting more than 5 seconds. The zone located after the final marker is also taken into account if the input is to continue more than 5 seconds after insertion of the market.

MANUAL NYSTAGMUS MEASUREMENT

The SPV (Slow Phase Velocity) and frequency of the nystagmus are calculated on the selected portion of the eye position curve when using the manual nystagmus measurement. This tool is particularly suitable for calculating the SPV of low or very low velocity nystagmus.

To add a new Nystagmus measurement:

- Select the position curve on which the measurement will be performed by clicking on the curve in the graph or on its legend (1). For example "Right Eye Vertical"
- Click on the icon  to start the creation.
- Click on the successive peaks (P1, P2, P3, ...) of the fast and slow phases from the left to the right to cover the whole calculation portion.
- To remove points, move the cursor to the portion to be removed, click on it once the selected straight line becomes a dashed line.
- Click on the icon  to stop the creation.

An existing measurement can be modified in a similar way with the icon  or deleted with the icon  by selecting an existing nystagmus measurement in the graph.

NORMATIVE VALUES ABOUT NYSTAGMUS

With NYSTALYZE system for the Nystagmus module when the visualization of normative data is enabled, reference tables appear. It is important to underline how the normative data can in fact be modified by the user and are associated with the patient's age groups. The tabular results of the tests, if the "Highlight normal/ abnormal values" option is enabled from the VNG settings, appear in green or orange, depending on the normative data that have been set.

The normative parameters of the VNG were drawn from the volume "B*alance function assessment and management – third edition – Gary P. Jacobson, neil T. Shepard*".

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