

Neural Response Telemetry

Tips and Hints

For Postoperative Advanced NRT™

Suggestions to obtain responses when AutoNRT™ is not successful, or for Nucleus® 24 implants in Custom Sound™ EP

- Choose Advanced NRT, then Create New NRT Series.
- Choose Create New Series.
- Choose the electrode you'd like to test in order to optimize the recording parameters.
- Click on the Stimulate Only tab.
- Start at a low level and increase until Loudest Acceptable Presentation Level is achieved.
- Return to the Quick Definition tab.
 - If an NRT response is observed, you may proceed to run Amplitude Growth Series.
 - If LAPL was obtained, but an NRT response was not observed, proceed as follows:
 - Choose Optimize Recording Parameters
 - Add Gain = 60, deselect Gain = 50 and Gain = 40 if AutoNRT has already been attempted
 - Add Recording Electrode Offset +3
 - Run the series
 - Choose the parameters that give you the best NRT response for use in the Amplitude Growth Series

WHAT TO REDUCE LOUDNESS PERCEPTION TO PATIENT

WHEN If the patient has sensitivity to loudness with increasing current level, there are several options:

- 1) Decrease the current level of the masker (from 10 to 5)
- 2) Reduce the rate of stimulation to 35 Hz, 20 Hz, 10 Hz (tracings will be acquired at a much slower rate but perception of loudness will be less)
- 3) Widen the pulse width, do not go beyond 50

WHY All of these options help reduce loudness perception so that current level that may be required can be increased.

WHAT CHANGING RECORDING ELECTRODES

WHEN Unclear responses/lack of responses.

WHY Changing the recording electrodes from +2 to +3 for apical recordings or manually changing basal electrodes may allow for larger response amplitude.

Background on Parameter Optimization

WHAT OPTIMIZING GAIN

WHEN Unclear responses/lack of responses. If possible, after optimizing gain use 60 dB gain. 40 dB of gain requires additional sweeps to acquire waveforms; it is also closer to the noise floor of the amplifier of the equipment.

WHY Adjusts to amplify response to more clearly see or measure it.

WHAT OPTIMIZING DELAY

WHEN Unclear responses/lack of responses.

WHY Sets the time between the end of the probe stimulus and the start of the recording, preventing the stimulus artifact from saturating the measurement amplifier.

WHAT INCREASING PULSE WIDTH

WHEN Running out of compliance (designated with an "O" next to the waveform).

WHY Increasing the pulse width will in turn require less current amplitude to be used, potentially allowing for recording a response. Don't use a pulse width greater than 50 micro seconds, else stimulation will still be occurring when recording starts.

Neural Response Telemetry

Tips and Hints

For Intraoperative Advanced NRT™

Suggestions to obtain responses if they are not present or clear

WHAT OPTIMIZING GAIN

WHEN Unclear responses/lack of responses. If possible, after optimizing gain us 60 dB gain. 40 dB of gain requires additional sweeps to acquire waveforms; it is also closer to the noise floor of the amplifier of the equipment.

WHY Adjusts to amplify response to more clearly see or measure it.

WHAT OPTIMIZING DELAY

WHEN Unclear responses/lack of responses.

WHY Sets the time between the end of the probe stimulus and the start of the recording, preventing the stimulus artifact from saturating the measurement amplifier.

WHAT VOLTAGE COMPLIANCE LIMITS REACHED ON ELECTRODES

WHEN Current level cannot be raised enough to yield response. ALWAYS use electrode conditioning. Automatically occurs in Custom Sound EP. Must be enabled in Custom Sound™ programming software. Start at 210 CL and reduce in 2 CL steps.

- 1) Reduce the rate of stimulation to 35 Hz, 20 Hz, 10 Hz (tracings will be acquired at a much slower rate, but allows for increase in current level).
- 2) Widen the pulse width, do not go beyond 50.

WHY Helps to reduce the likelihood of going out of voltage compliance on electrodes so that current level that may be required can be increased. If this occurs on just a few electrodes you should not worry about spending a whole lot of time on this.

WHAT CHANGING RECORDING ELECTRODES

WHEN Unclear responses/lack of responses.

WHY Changing the recording electrodes from +2 to +3 apical electrodes or manually select basal electrodes for recording, this possibly allows for larger responses.

Other Recommendations

Turn off infared on laptop so as to not interfere with the RF from the transmitting coil. Start stimulation and recording at apical end of array to allow the basal electrodes to settle after closure of the cochleostomy. Do not put transmitting coil directly on implant, needs to have skin flap over it. This is because the RF link operates in a range f 20-10 mm.

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