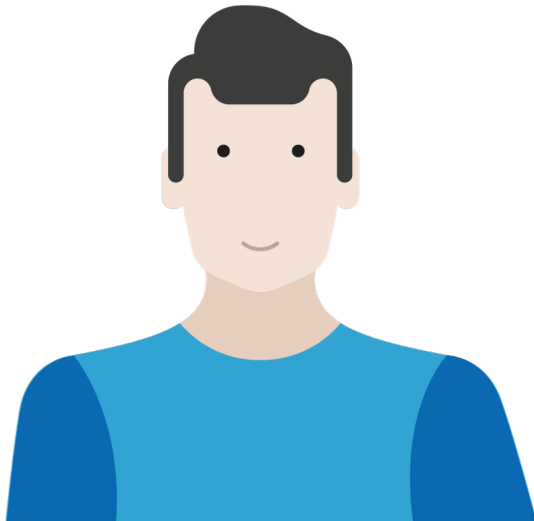


Hands-On with Target CI

NRI in Target CI



Josh Inn received an Advanced Bionics cochlear implant for his left ear. His hearing healthcare team knows that Neural Response Imaging (NRI) is a valuable tool that can be used to obtain objective measurements of the electrically evoked compound action potential (eCAP), which can assist with both intra-operative testing and post-operative CI programming.

The cochlear implant protocol at Josh's center includes obtaining baseline NRI results within the first three months of implantation. Use the following exercise to simulate performing NRI in Target CI.

Open Target CI

NRI can be performed in Target CI fitting software using a Marvel CI sound processor and Noahlink Wireless. NRI can also be performed during an in-person clinic visit or during a remote programming session.

- ☐ Open Target CI.

Open Target CI Session

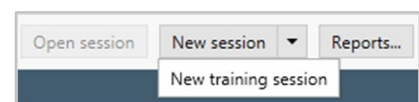
If you have Josh Inn's client file saved from a previous hands-on activity, complete the following steps.

- ☐ Select Josh Inn's client file (highlighted in green).
- ☐ Select **New session** > **New training session**.

If you do not have Josh Inn's client file saved from a previous hands-on activity, complete the following steps.

- ☐ Select **New client**.
- ☐ Enter the required information.
 - Last name: Inn
 - First name: Josh
 - Date of birth: 01/01/1971

- ☐ Select **Save**.
- ☐ Confirm Josh's client's file is selected (highlighted green), select the drop-down menu beside **New session**, and select **New training session**.

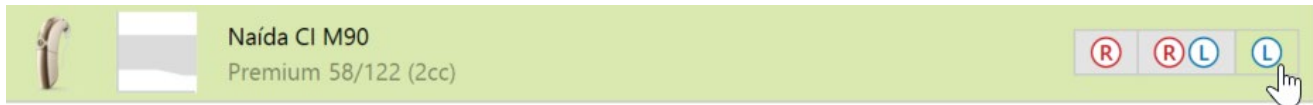


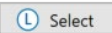
-  **Pro Tip:** New session is recommended for the first fitting session only (initial activations). Open session should be used at all follow up visits to allow the programming professional to access historical impedance and NRI data. (NRI and impedance data are not stored in the sound processor.)

INSTRUMENTS TAB

Connect the Hearing Instrument(s)

- Select the **Instruments** tab and identify the hearing instrument that Josh will use (Naída CI M90).

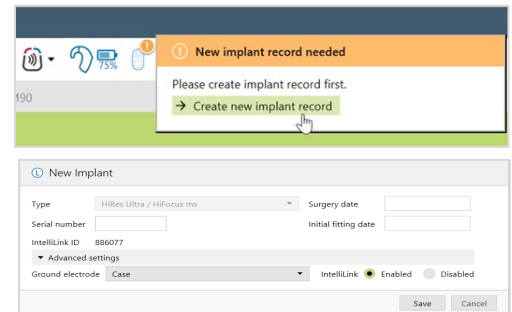


- Click on **L** to identify the side for which Josh's device is intended to be used.
- Connect the hearing instrument by selecting **Connect** in the Dashboard.
- Click on  to confirm the side for which Josh's device is intended to be used.
- Select **Continue**.
- Once a successful connection has been established, select **Close** to proceed.

CLIENT TAB

Connect to Internal Device

- In the Dashboard, hover on the orange ! and select **Create new implant record** for the left side to add the implant information.
- Confirm implant type. Enter any additional implant information.
Note: Implant type will be selected automatically when headpiece is connected to recipient's internal device.
- Select **Save**.



Review Impedances

Impedances will run automatically by default when connected to the recipient's implant.

- Access the **Impedances** tab.
- Review impedances.
- Only run NRI on electrodes with normal impedances.

Note: Do not perform NRI on extra-cochlear, shorted, open, or out of compliance electrodes.



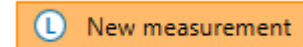
How are you able to identify and electrode that is open or short in Target CI?

Access Neural Response Imaging (NRI)

- ☐ Access the **NRI** tab.

Note: Due to probable impedance changes after surgery, it is best to re-run NRI in the clinic prior to creating new maps for the recipient instead of using NRI data collected in the OR.

- ☐ Select **New measurement** to open the NRI measurement window.



Select a Template

- ☐ Select the drop-down under **Template**.



Which NRI templates are available for use in Target CI?

Template

Odd electrodes

Set to 0

Odd electrodes

Even electrodes

OR



Pro Tip: NRI ranges will automatically apply based on the age in the recipient's file. Adult odd and even values range from 100-300 CUs. Pediatric odd and even values range from 50-250 CUs. OR values range from 150-400 CUs for both adult and pediatric recipients.

- ☐ For Josh's baseline NRI measurement, select the **Set to 0** template. Select electrodes 3, 7, 11, and 15.
 - Select the stimulating electrode(s) in the NRI window by clicking on the electrode numbers.



Pro Tip: Use keyboard shortcuts to select more than one electrode at a time. Hold the **Ctrl** key while selecting channels in the data grid to measure multiple electrodes. Use the **Ctrl + A** keys to select all electrodes for NRI measurement.

Adjust NRI Settings

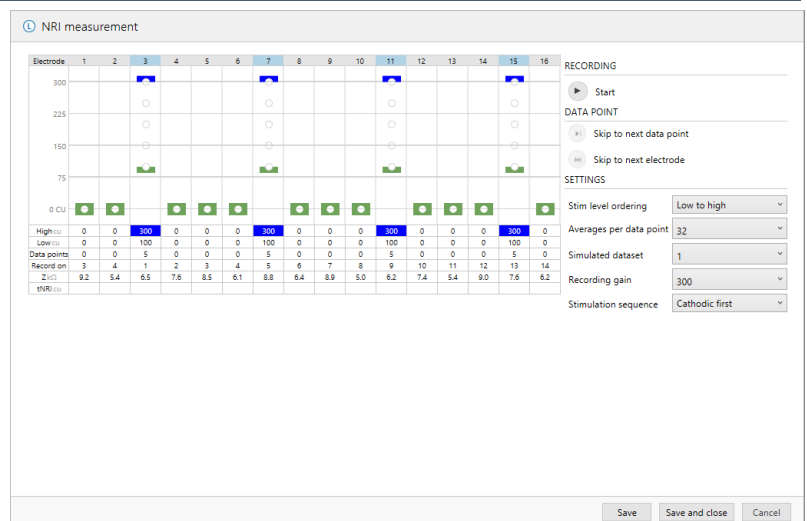
- ☐ Set High and Low CU values for electrodes. You are seeing Josh post-operatively and he is an adult, so use the following settings as a starting guide:
 - Low CU = 100
 - High CU = 300

Set the values for the electrodes to be measured by clicking and dragging the bars or by typing values into the boxes.

Note: Behavioral M-Levels can be used as a guide to establish initial low and high CU values. A minimum range of 150 – 200 CU should be considered where the low CU value results in one or two responses within the noise floor.

- ☐ Review the number of Data points. Five Data points are selected by default.

Note: Additional Data Points can be added as needed. Unmeasured data points are indicated by an open circle. Filled data points indicate a completed measurement.



The screenshot shows the 'NRI measurement' window. It features a grid for selecting electrodes (1-16) and setting High/Low CU values. The 'RECORDING' section includes buttons for 'Start', 'Skip to next data point', and 'Skip to next electrode'. The 'SETTINGS' section includes dropdowns for 'Stim level ordering' (Low to high), 'Averages per data point' (32), 'Simulated dataset' (1), 'Recording gain' (300), and 'Stimulation sequence' (Cathodic first). At the bottom are 'Save', 'Save and close', and 'Cancel' buttons.

Electrode	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
High CU	0	0	300	0	0	0	300	0	0	0	300	0	0	0	300	0
Low CU	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0
Data points	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5	0
Record on	3	4	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Z (Hz)	9.2	5.4	6.5	7.6	8.5	6.1	8.8	6.4	8.9	5.0	6.2	7.4	5.4	9.0	7.6	6.2

- ☐ Choose the appropriate Stim Level Ordering. Select **Low to High** for to measure conduct NRI for Josh post-operatively.

Select Start

- ☐ Select  **Start**.
- ☐ Monitor Josh for signs of discomfort while NRI is running to ensure stimulus levels are not exceeding his comfort levels. NRI will continue to conduct measurements until all data points have been obtained.
- ☐ Press **Pause** or the **S** key to stop running measurement at any time.
- ☐ Identify the **Skip to next data point** and **Skip to next electrode** options.

DATA POINT

 Skip to next data point

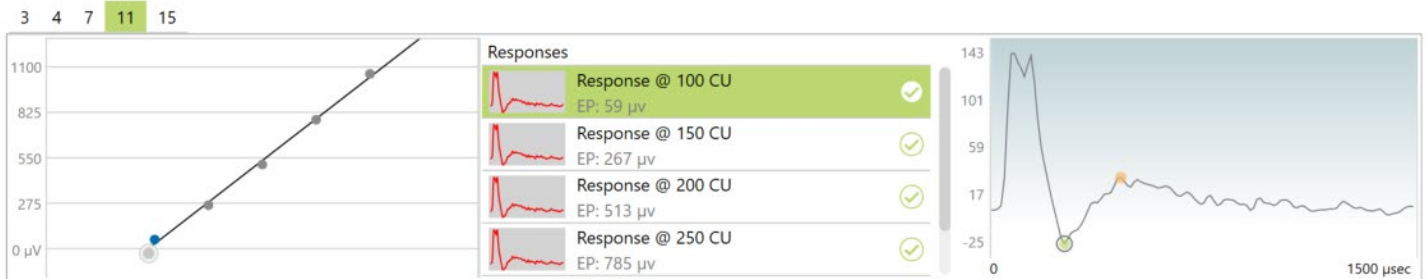
 Skip to next electrode



When might you use Skip to the next data point or Skip to the next electrode?

NRI Analysis

- ☐ Review the data for each electrode measurement.



What characteristics are you looking for with a good NRI response?



Pro Tip: To repeat measurements in future sessions, use the copy setting function, as shown below.



- ☐ Select **Save and Close** to complete NRI.

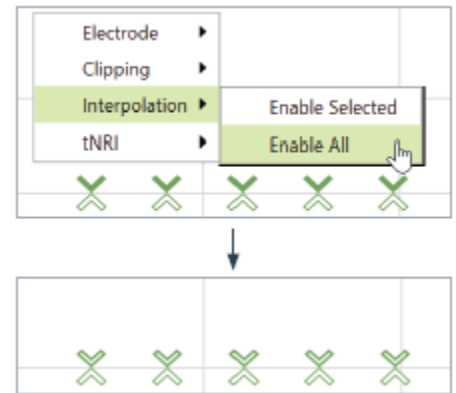
FITTING TAB

Create a Map Using NRI Data

- ❑ Select the **Fitting** tab > **Mapping** to create a map for Josh using NRI data.

Note: Consider using the Map dropdown **Create copy with** to create a copy of a Calm Situation Program in order to create an NRI map for Josh and compare it to his current map.

- ❑ Select the **Mapping** tab, right-click on any electrode and select **Interpolation**, then **Enable all**. All M-Level and T-Level markers will be displayed as unfilled or open arrows.
- ❑ On the channels with measured NRI (3, 7, 11, and 15), set M-Levels to the tNRI values. tNRI values are marked on the map with a grey target symbol .
- ❑ Confirm **Live Speech** as the stimulation mode.
- ❑ Globally reduce the M-Levels slightly to ensure Josh remains comfortable, then **Start Stimulation**.
- ❑ Globally increase M-Levels to find Josh's most comfortable level (level 6 on the loudness scale).
- ❑ Consider loudness balancing across each electrode, then verify settings (i.e. Ling Sounds, soundfield detection, etc.).



Complete the Programming Session

- ❑ Select **Close Training**.
- ❑ Select **OK** to confirm saving is not possible in training mode and close the session.



When will you use NRI in your clinical practice?



Success! You have successfully measured NRI!