

**Relationship of Neural Response Telemetry Threshold (NRTT) and Electrically evoked Stapedius Reflex Threshold (ESRT) to cochlear implant comfortable (C) and threshold (T) programming values.**

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**Objective:**

This study investigated whether either the intraoperatively measured neural response telemetry thresholds (NRTT) or the electrically evoked stapedius reflex thresholds (ESRT) could predict the contour of behaviourally programmed T-Levels (minimal stimulation) and/or C-Levels (maximum stimulation) on two different types of Cochlear implant (CI) devices, the Nuc24RCS/RCA (Nucleus 24) System and Nuc24RECA (Nucleus Freedom) System.

**Methods:**

Threshold data from 50 patients with a minimal age of 6 years was used. 12 patients received the Nucleus 24 implant and 38 patients the Nucleus Freedom implant. In the Nucleus 24 group data from 11 patients (91.7%) was available for both measurements (NRT and ESRT), and in the Nucleus Freedom group from 34 patients (89.5%). The T- and C-levels measured one and six months after first fit were correlated with inter-operative threshold values for 4 electrodes (4, 10, 14 and 20) after correcting for mean individual offsets.

**Results:**

Correlations  $\rho$  with C and T levels were higher for ESRT compared to NRTT. For the Freedom device, between 0.4 and 0.7 for NRTT compared to between 0.6 and 0.9 for ESRT. This difference was present for both Nucleus devices. The correlations were generally lower for basal compared to apical electrodes. Mean offsets were 81 current levels (CL) between ESRT and T, and 58 CL between NRTT and T. **Conclusions:** Once the average offset is taken into account, ESRT are better correlated with C and T CI speech processor settings than NRTT. Improvements in ESRT techniques could yield even more accurate predictions of the C and T level profiles.

