CHAPTER 4: OBSERVATIONS AND RESULTS

The study analyzed the longitudinal trends & correlations between electrophysiological tests & behavioural responses, recorded over time among the various cohorts of cochlear implantees. The study did not attempt to compare the results between the different implant companies or between the various types of implants studied, since variables like electrode design, speech processing strategy, testing and programming parameters would bias any such comparison.

The research team has observed that all implant types and models have shown comparable outcomes with conventional implant fitting measures done during their sequential follow up schedules. No distinct benefit was noted among those children using a superior implant model, with respect to their electrophysiological measurements or in their behavioural responses. All the 58 subjects of the study group have shown equally good progress in their auditory verbal skills with intensive auditory verbal habilitation. All these children are doing well today, making good use of their implants and all of them have been integrated into mainstream schools for seeking normal education.

The trends observed sequentially over time, in the various electrophysiological current thresholds and the most comfortable levels,
helped in generating normative values with mean average current levels for each cohort and these values were used for statistical correlations. All the implant groups (irrespective of the model or type of the device studied), showed similar statistically significant positive correlations between behavioural comfort levels and the multiple electrophysiological measures, which improved with implant use over time. These correlations were used to derive predicted comfort levels using linear and multiple regression analysis. Such predicted comfort levels were found to be in proximity to the actual psychophysical behavioural comfort levels recorded among the various cohorts and proved to be statistically reliable.

The correlations, regressions and statistical prediction methods tested in the various cohorts were found to be similar and reliable in both larger and smaller cohorts, when applied electrode-wise and for representative electrodes in three offsets across the array. The multi-modal prediction method was found to have better statistical reliability & clinical accuracy in predicting comfort levels, than the linear prediction methods, using any of the three electrophysiological measurements.

The statistical prediction method was clinically tested among randomly selected members of each cohort, at 1 month & 12 months of implant use. These clinical trials were found to be successful as was expected, since there was not much of a variation noted in the current levels except for a few
programming units, between the behaviourally set MAP and the corresponding statistically predicted MAP. Subjects of the various cohorts, when tested for their auditory / behavioural feedback with CI aided audiometry & auditory verbal skill tests, while using their statistically predicted programs, responded effectively and in comparison to the responses which were previously recorded with their behaviourally set MAPs.

In general, clinical results from the various cohorts, highlighted the consistency of the statistical prediction method, as it was able to provide a working MAP, close to the conventional behavioural MAP used by these children, at any time of implant use.

Individual data analysis from each of the study cohorts is presented in the following sections. An overall summary and outcomes in the study groups have been highlighted in the subsequent chapter.