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# Hearing handicap and quality of life: Reports by cochlear implantees and their frequent communication partners

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*Questionnaires concerning communication, hearing handicap and quality of life were posted to all 55 adult cochlear implantees known to be resident in South Australia. Parallel questionnaires were included for completion by a chosen frequent communication partner. This interim analysis focuses on replies from 34/55 (61.8%) of recipients currently received on two scales included in the questionnaire; the Hearing Handicap Inventory for the Elderly (HHIE - Ventry & Weinstein, 1982), and the SF-36 (Ware, Snow, Kosinski & Gandek, 1993). The main results indicate that: (a) implantees and their frequent communication partners substantially agree in their assessment of the hearing handicap remaining post-implantation, and (b) implantees' ratings of aspects of quality of life are similar to those of the general population in South Australia. These results indicate both the complimentary and confirmatory nature of these two scales. Implications for assessment and intervention for this population are discussed in light of these findings.*

Rehabilitation services for adults who have acquired hearing impairment focus largely on communication difficulties, however, hearing loss has been suggested to result for some people in various social restrictions resulting in isolation, depression and a resultant reduction in quality of life (Knutson & Lansing, 1990). Communication difficulties also impact on many people in the immediate environment of the individual with the hearing loss, and aural rehabilitation programs have placed increasing emphasis in recent years on the role of the communication partner in therapy (Erber, 1996). The frequent communication partners' perceptions of the success of communication, specifically, and of the degree of disability and/or handicap, more generally, have been suggested to influence their attitude towards participating in and the success of intervention (Spitzer, Leder & Giolas, 1993). However, only infrequently has self-reported disability and/or handicap been compared with the reported views of frequent communication partners.

The importance of the communication partner in conversation is clear, however the importance of the partner to the hearing impaired individual is possibly even greater (Erber, 1996). In a study of the referral patterns of the severely hearing impaired they were found to be three times more likely to be motivated to seek help for hearing problems by a family member than to be self-motivated (O'Mahoney, Stephens, & Cadge, 1996). Further, individuals perceive the greatest difficulty caused by their hearing loss to be related to the frustration their partners feel in attempting to communicate with them. As such the frequent communication partner is intrinsically involved in the communication process.

Self-assessment of hearing loss and its attendant disabilities and handicaps has been used since the 1930s and is seen as an important tool supplementing the information gained from pure tone average testing (Noble, 1998). Self-assessment results encompass the aspects of everyday hearing and communication that cannot be reflected in formal audiometric testing (Kielinen & Nerbonne, 1990; Lutman & Marshall, 1997; Schow & Gatehouse, 1990).

This paper aims to investigate perceived hearing handicap and quality of life as reported both by adult cochlear implantees and their chosen frequent communication partners. Specifically, this paper addresses three questions: (a) whether adult cochlear implantees and their chosen frequent communication partners differ in their judgments of hearing handicap following

implantation, (b) whether adult implantees differ in their self-reported judgments of social and emotional difficulties on hearing-specific versus general health measures, and (c) whether implantees differ in their judgements of quality of life from the general South Australian adult population.

## Method

### *Participants*

Cochlear implantee participants (CIs) were drawn from all adult implantees on record at Flinders Medical Centre Department of Audiology as being resident in South Australia ( $n = 55$ ). Of this number, responses were received from 34 at the time of the current analysis. The respondents ranged in age from 19;2 years to 90;1 years, with a mean age of 61;0 years. The time elapsed since implant surgery ranged from 11 weeks to 15;10 years, with the mean length of time being 6;6 years post-surgery. Thirty-three CIs had one ear implanted, one CI had both ears implanted. Twenty-one of the CIs were female and 13 were male. Twenty-six of the respondents had an acquired hearing loss and five were prelingually deaf, the remaining five had no recorded information regarding their loss. Twenty-seven of the respondents had a progressive hearing loss and five had a hearing loss of sudden onset, two CIs had no information as to the onset of their hearing loss. At the time of the study the CIs were using the following processing systems: MSP 1, Spectra 20, Sprint 8, and Esprit 5. The number of active electrodes at the most recent assessment varied from 4 to 22 with the mean number of active electrodes being 18.

Frequent communication partners (FCPs) were chosen by CIs to complete the Communication Partner version of the questionnaire. Two of the 34 FCPs did not complete the demographic data. The age of the frequent communication partners ranged from 30;0 years to 90;3 years with a mean age of 58;1 years. There were 17 female and 15 male FCP respondents. Twenty-seven respondents lived with their frequent communication partners, five lived elsewhere. Two of the FCPs reported having a hearing loss. The relationships between CIs and FCPs are outlined in Table 1.

**Table 1. The relationship of the frequent communication partner to the cochlear implantee**

<b>Relationship Type</b>	<b>No. of respondents</b>
Spouse	22
Parent	3
Child	4
Friend	1
Sibling	1
Daughter-in-law	1
Did not answer	2

### *Questionnaire*

The Hearing Handicap Inventory for the Elderly (HHIE) (Ventry & Weinstein, 1982) and the SF-36 Standard English (Australia/New Zealand) Version 1.0 Survey (Ware, Snow, Kosinski & Gandek, 1993) were used in this study. The HHIE provided an indication of the possible

handicapping effects of the CI's current level of hearing (i.e., post implantation), as perceived by the CI and the FCP (Ventry & Weinstein, 1982). Scores were presented as a total and on two subscales: social and emotional. The social subscale summarises the impact of the hearing loss on the client's activities, while the emotional subscale reflects how the hearing loss makes the client feel (Dillon, James, & Ginis, 1997; Ventry & Weinstein, 1982). The SF-36 provided an estimate of the quality of life experienced by the CI by self-report. The results of the SF-36 may be grouped into eight dimensions of health, of which the subscales of General Health, Social Functioning and Role/Emotional were used for this study. South Australian norms for the SF-36 collated by the Behavioural Epidemiology Unit, South Australian Health Commission (1995) were used for comparative purposes.

Following The Total Design Method (Dillman, 1978) questionnaire packages were sent to all 55 cochlear implantees. The package consisted of: (a) a personally addressed introductory letter; (b) two questionnaires - one for the CI and another (with appropriate wording alterations) for a FCP of the implantee's choice; (d) separate instructions for the completion of each questionnaire, and; (e) a reply paid envelope. The Total Design Method involved: (a) initial postage of the questionnaire package; (b) a short reminder letter posted one week after the initial questionnaire package mailing; (c) a second reminder letter three weeks after the initial mailing, and; (d) a third follow-up letter with a replacement questionnaire package six weeks after the initial mailing.

In the 34 cases where both questionnaires were returned completed or attempted, the data was coded and recorded in the project database matched to the appropriate demographic data. Data were analysed using SPSS for Windows version 10.0.5 (SPSS Inc., 1999).

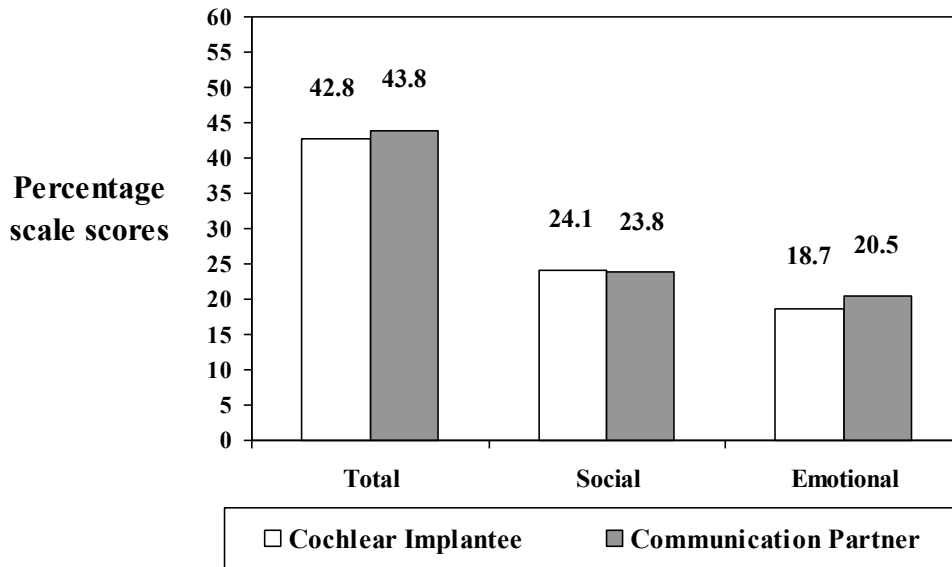
## **Results**

### *HHIE Scores*

The mean total score on the CI's HHIE was 42.76% (SD = 18.86) with a range from 12 to 78%. The mean score on the Emotional subscale was 18.71% (SD = 10.35) with a range from 2 to 36%. The mean score for the Social subscale was 24.06% (SD = 9.40) with a range from 6 to 42%. The mean score on the FCP HHIE (Total) was 43.82% (SD = 17.71) with a range from 8 to 74%. The mean score on the Emotional subscale was 20.53% (SD = 11.06) with a range from 0 to 42%. The mean score for the Social subscale was 23.29% (SD = 8.19) with a range from 6 to 44%.

Paired Sample *t*-tests indicated no statistically significant difference between the CI and FCP HHIE scores for the Total ( $t = -.37$ ,  $df = 33$ ,  $p = 0.718$ ), Emotional ( $t = -1.07$ ,  $df = 33$ ,  $p = 0.292$ ), and Social ( $t = -.54$ ,  $df = 33$ ,  $p = 0.592$ ) scales (Figure 1).

Figure 1. Mean scores on HHIE by cochlear implantees and their chosen communication partners



### *SF-36 Scores*

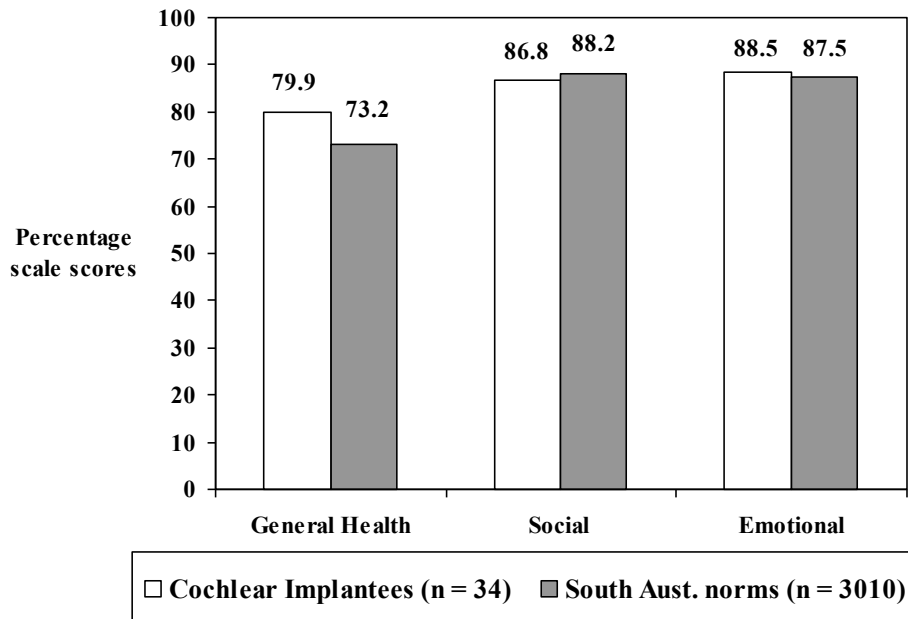
The CI's mean score on the SF-36 General Health subscale was 79.85% (SD = 16.14), the mean score on the Role-Emotional subscale was 88.54% (SD = 24.84), and the mean score for the Social Functioning subscale was 86.77% (SD = 17.93). The mean score on the SF-36 General Health subscale for the South Australian general population was 73.2% (SD = 21.7). The Role-Emotional subscale score was 87.5% (SD = 28.9) and the Social Functioning subscale score was 88.2% (SD = 21.3).

T-tests indicated no statistically significant difference between the SF-36 scores for the CIs and the South Australian state norms on the Role-Emotional ( $t = 0.237$ ,  $df = 31$ ,  $p = 0.814$ ) or Social Functioning ( $t = -0.467$ ,  $df = 33$ ,  $p = 0.644$ ) subscales. However, a statistically significant difference between the CIs and the South Australian state norms was indicated on the General Health subscale ( $t = 2.40$ ,  $df = 33$ ,  $p = 0.022$ ), with CIs reporting better general health than the population of South Australia (Figure 2).

### *Comparison of HHIE and SF-36 scores*

Paired sample correlations indicated: (a) a statistically significant correlation between the CI HHIE and CI SF-36 scores for the Emotional/Role-Emotional (Pearson correlation = -0.40,  $df = 31$ ,  $p = 0.024$ ), and (b) Social/Social Functioning (Pearson correlation = -0.56,  $df = 33$ ,  $p = 0.001$ ) subscales.

**Figure 2. Cochlear implantees' mean scores on the SF36 scales compared with the adult South Australian population**



## Discussion

Results showed that there was no statistically significant difference between the CI and FCP HHIE scores for the total, emotional, and social/situational scales. This finding indicates a concurrence on the level of handicap experienced by the CI, that is, a perceived handicap based on the HHIE scores (Ventry & Weinstein, 1982) and the FCP. This concurrence was in contrast with other studies (Chmiel & Jerger, 1996; Maillett, Tyler & Jordan, 1996; Newman & Weinstein, 1988; Spitzer et al., 1992) which found significant differences between self-report and significant others' scores for the hearing impaired. The large standard deviations and associated range values in the HHIE are indicative of the fact that individuals respond very differently to hearing impairments (Malinoff & Weinstein, 1989; Noble, 1998).

The comparison of mean HHIE total and subscale scores indicated that both implantees and their communication partners were aware of some residual hearing handicap subsequent to implantation, and that partners tend to agree substantially on the degree of hearing handicap remaining. There was significant concordance between implantees and their frequent communication partners about the degree of hearing handicap as measured by the HHIE total and subscale scores. This finding augers well for the planning and execution of aural rehabilitation programs especially as social functioning has been identified as one of the most important areas of concern following implantation (Zhao et al., 1997). It has been suggested that the success of therapy may be threatened or adversely affected by significant disagreements amongst family members and friends concerning the nature and/or degree of difficulty arising from an acquired hearing loss (Spitzer et al., 1993). Increased attention to the pre-operative information and the greater involvement of family members and friends in the post-implantation appointments may account for some of this agreement, and it is hoped that further analysis of the questionnaire data on communication will shed light on this finding.

SF-36 results indicate that CIs reported a better General Health score than the mean South Australian score. It is noteworthy that there was no statistically significant difference on the Role/emotional and Social/situational subscales between the quality of life rating for the CIs and the general population of South Australia, however this was not the case for the General Health subscale.

Results from the SF-36 indicate two important points, firstly our sample of implantees perceived themselves to be no less healthy than the general adult South Australian population. Secondly, there was substantial correlation between the two questionnaires (i.e., the generic SF-36 and the hearing-specific HHIE) on measures of social and emotional functioning. In combination these results indicate that the General Health portion of the SF-36 and the HHIE scores may represent different aspects of the individual's functioning. Thus while implantees may see themselves as healthy, they are aware never-the-less of the hearing specific difficulties that remain post-implantation. Alternatively it may be suggested that a degree of perceived hearing handicap does not seem to adversely affect one's view of his/her general health. By contrast, the statistically significant correlation between the HHIE and SF-36 subscale scores indicates that the generic and hearing-specific social and emotional measures may tap into the same issues as perceived by adult implantees.

## **Conclusion**

In summary, while CIs continue to experience communication difficulties and ongoing hearing handicap due to their hearing loss, this does not affect their overall quality of life. Further, the two measures used in this study provide both complimentary and confirmatory information about the self-perceived effects of hearing loss on aspects of daily functioning and the scales in combination provide a richer/broader picture of aspects of daily function and health than either does alone. It remains to be seen whether other dimensions of the SF-36 are useful in predicting the impact of hearing loss on quality of life.

The sample from which this interim data was elicited represents a large portion (34/55, or 61.8%) of the registered adult cochlear implant population currently living in South Australia. However, this data may allow only limited future comparison of hearing handicap and quality of life results by characteristics of implantee (age, gender, duration and severity of hearing loss, post implantation pure tone and speech discrimination, etc.), characteristics of implant (e.g., time since implant surgery, type of speech processor, number of electrodes, etc.) and/or characteristics of communication partner (age, gender, relationship to implantee, etc.). Many of these characteristics may influence perceptions of hearing handicap and/or quality of life and as such future research may be aimed at obtaining similar data from larger samples of adult implantees. It should be noted that the present study included subjects aged from 19;2 to 90;1 years and that such a large age range is bound to encompass a wide range of responses relating to hearing handicap and quality of life.

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