

## **Children and Young People with Cochlear Implants: Categorising Hearing Loss**

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### **Background to the project**

The Achievements of Deaf Pupils in Scotland (ADPS) project has been collecting annual data relating the education of deaf children and young people in Scotland since November 2000. We are based within the University of Edinburgh and are funded by the Scottish Executive.

Teachers of deaf children all over Scotland provide information for ADPS, much in the same way as for the BATOD survey. Readers may remember a four-page insert about the project, which appeared in the BATOD magazine of February 2003. We have worked closely with BATOD and, in 2003, we arranged to collect and share relevant data on Scotland. This meant that teachers weren't asked to complete two survey returns in one year.

We have now collected four years of data. As you would expect, one of the key types of information we ask for is hearing loss level. This means that we can report differences between groups of children with, respectively, profound, severe, moderate and mild hearing loss levels. Can, or should, cochlear implanted children be described as 'profoundly deaf'? That is a question which we have debated since the beginning of the project. The following story describes the way our thinking has developed.

### **Ascertaining hearing loss levels: year 1**

In the first year of the survey, we asked teachers to give us the calculated audiometric descriptor for each ear (unaided and aided), rather than individual threshold readings at each frequency. In other words, we asked them to say whether the child had a profound, severe, moderate or mild loss in each ear, by averaging the hearing threshold levels across all frequencies. We used the BATOD-approved audiometric descriptor system as recommended by the British Society of Audiology (BATOD, 2004). Where a child had a cochlear implant, teachers mostly classified the children as profoundly deaf in the unaided level options; one or two classified as severely deaf and others did not specify an unaided level.

### **Ascertaining hearing loss levels: year 2 onwards**

In the second year of the survey, we had the opportunity to ask for more detail about hearing loss levels. So, from then onwards we have asked for specific readings at each frequency and have calculated the average thresholds automatically – both for unaided and aided levels. This means that we have the capacity to categorise hearing loss levels in more detailed ways where this may be useful in the future. We have come across a number of examples where a child technically falls into one category, but could be seen to fit functionally into a different category. For example, a pupil who is categorised as severely deaf when using the audiometric descriptor formula, but is profoundly deaf in one ear and has a profound loss in the high frequencies in the other ear. There are likely to be more sophisticated formulas developed over time to take account of functionality. For example, Educational Audiologist Russell Brett

argues that an 'Articulation Index' based on results of a relatively complex formula applied to aided hearing loss audiograms (Brett, 2003) is an effective alternative when assessing spoken language access services for a school pupil.

However, in line with the BATOD survey, for the moment at least, we continue to use the traditional audiometric descriptors when reporting findings by levels of hearing loss – using unaided levels.

### **Where did this leave children and young people with cochlear implants?**

A lot of teachers provided detailed unaided audiogram information for children/young people with implants, based on the last unaided readings taken pre-implantation. A number of teachers phoned to ask for advice where this meant giving information that was a few years old - and a sizable proportion gave no threshold information at all.

We consulted with cochlear implant specialists and had long discussions about the 'common sense' as well as the technical aspects of the situation. If you view the implant as a very sophisticated hearing aid then, despite its intended permanency, you would still consider the hearing loss level of an implanted child as being profound. If the implant is disconnected, then the child is profoundly deaf.

So, in co-operation with an implant centre, we first considered the option of entering flat, high readings across all frequencies, where no thresholds had been provided for implanted children. This would have meant that all these children would automatically be categorised as profoundly deaf. However, we were uneasy about contriving any information, however pragmatic. In particular, we were aware that a small number of the pre-implant unaided thresholds provided actually put the child within the severely rather than profoundly deaf category. So, it was not right to make the assumption of profound deafness in all cases.

We also considered using the aided thresholds but we would then need to categorise all children by aided rather than unaided thresholds for other children, which would cause all manner of complications.

So the only option left was to simply categorise all cochlear implanted children as a distinct group. The main disadvantage is that it further splits the whole group, thus potentially reducing statistical significance when analysing against a number of other factors. However, weighing everything up, this is what we have decided to do, with the expectation that we will be able to see statistically significant patterns emerging over time – the benefit of longitudinal study. So, from 2001/02 findings onwards, when we show statistics broken down by hearing loss level, we now categorise children as 'profound', 'severe', 'moderate', 'mild' and 'cochlear implanted'. As with so many things, we don't necessarily see this as the end of the story, as it's still an issue for debate. Watch this space.

Do visit our website to see basic descriptive findings, as well as other details about the project.

[www.education@ed.ac.uk/adps](http://www.education@ed.ac.uk/adps)

BATOD (2004) “*Audiometric Descriptors*” *Information Sheet*. [online]. Available from: <http://www.batod.org.uk/index.php?id=/articles/audiology/audiometric-descriptors.htm>

Brett, R. (2003) ‘Allocation of support levels to hearing-impaired children – moving away from using audiometric descriptors’. *Deafness and Education International*, 5(3), 167-183.