11TH HEARING PRESERVATION WORKSHOP, TORONTO, CANADA, 18–21 OCTOBER 2012

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Some 180 participants from all over the world attended the 11th Hearing Preservation Workshop in Toronto on 18–21 October 2012. It was a meeting of prominent specialists organized by the cochlear implant company, Med-El.

This year 35 papers were presented, 17 from Canada and the USA and 16 from Europe. Poland had an impressive share, with 5 papers coming from the Institute of Physiology and Pathology of Hearing, represented by Prof. Henryk Skarzynski, Dr Piotr H. Skarzynski, Dr Anna Piotrowska, and Dr Artur Lorens.

In an opening lecture Prof. H. Skarzynski presented longitudinal results of partial deafness treatment with cochlear implants. The lecture summarised the speech understanding of cochlear implant users who had had partial deafness and how they performed after implantation and up to 10 years later. Prof. Skarzynski drew the audience's attention to the paradox that "*in partially deafened patients we can, unfortunately, expect that, in the longer term, there will be a progression of inner ear problems and thus deterioration of natural hearing (both in the implanted and in the other ear). Hearing threshold tests confirm this. But what is particularly interesting is the fact that speech understanding in silence does not deteriorate in the long term, and in fact speech understanding in noise can even gradually improve*.

This observation demonstrates that in these patients deterioration of natural hearing may be compensated for by modifying the settings of the speech processor (nowadays called the audio processor), which is especially designed for cases of partial deafness. Prof. Skarzynski explained the paradox in terms of brain plasticity, so that progressive improvement in speech understanding in noise is due to the ability of certain structures in the brain responsible for understanding of speech to slowly change and improve in function.

The research presented by Prof. Skarzynski is the first clinical study to demonstrate the efficacy of partial deafness treatment using cochlear implants. Until now, other research has focused only on the experimental side of the efficacy or safety of this treatment method.

Evidence-based medicine as currently promoted recommends clinical management based on the best available research results on efficacy and safety. Evidence can come through both experiment and observations. The results presented by Prof. Skarzynski fill a gap in our knowledge of the partial deafness treatment method, confirming that the method if safe and effective and therefore recommended for clinical practice.

Other presentations from the Institute also focused on the topic of partial deafness. Dr. Piotr Skarzynski presented a study on the efficacy and safety of the partial deafness treatment method in children. The topic of hearing loss in children was continued by Dr Anna Piotrowska who gave a presentation on hearing screening in school-age children. Her presentation referred to two important documents initiated by Prof. H. Skarzynski and his team at the Institute: first, the *European Consensus on hearing, vision and speech screening in pre-school and school age children*, and secondly, *the EU Council Conclusions on early detection and treatment of communication disorders in children, including the use of e-Health tools and innovative solutions*.

Dr Artur Lorens presented preliminary results of innovative experimental research aimed at explaining the mechanisms involved in reception by the auditory system of information transmitted simultaneously in the acoustic (natural sound) and electrical (electrode stimulation) modes. This clinical study of patients with partial deafness involved joint electrical and acoustic stimulation of the same region of the auditory receptor. Preliminary results demonstrate the feasibility of using joint stimulation, showing that the information transmitted electrically does not disturb information transmitted acoustically, and vice versa.

Information about the partial deafness treatment method has been complemented by Dr Rene Gifford from Vanderbilt University, who presented a multicenter American-Polish research project in which Poland was represented by the Institute of Physiology and Pathology of Hearing. Study of simultaneous electric and acoustic stimulation, conducted on both Polish and American patients, showed significant improvement in speech understanding compared to electric-only and acoustic-only stimulation; this was particularly the case in difficult hearing conditions created experimentally by introducing sound reverberation (echo) and multiple disrupting signals from different directions.

The Toronto meeting was a unique occasion to exchange information and experiences, both from the clinic and in research settings. The wide range of topics covered by the workshop included not only surgical studies but reports from the fields of genetics, molecular biology, and biomedical engineering.