

Abstract EFAS/DGA 2007

Neuronal fitting of hearing aids

Kurz, H.-R.

Kurz Hörsysteme Wiesmoor

For many years now little progress has been made in the fitting work performed by hearing aid audiologists, which may be explained by the following reasons:

Incorrect programming occurs as the acoustic data is measured with audiometers, standardised 20ccm² couplers and closed headphones.

These measurements are incorrect because modern hearing systems are worn open or with an otoplastic, with the result that the ear input resonances gained with closed 20ccm² headphones are either not achieved or dissipated.

Reproducible measurements can only be obtained with open headphones and are only comparatively useful if reproducible measuring results obtained under realistic conditions produce the best possible speech comprehension.

Due to the changes in ear input resonances and volume levels, ear fitting pieces for connecting hearing aids to the individual anatomy are subject to considerable irreproducible changes and influences that provide an incorrect result for the configuration of the hearing aid.

The peripheral and central hearing loss varies from patient to patient. A combination is also possible.

Today, hearing aids are still configured empirically, i.e. according to the "hearing preferences" of the patient, even when an in-situ measuring device is used.

As a result, the hearing performance is always programmed to the level with which the respective wearer is familiar and comfortable with.

A transmission range that ensures the desired improvement in speech comprehension should, however, be provided.

The industry is still developing hearing aid software empirically from 20 ccm² coupler values. Consequently, hearing aids fall short of the necessary hearing threshold by up to 40 dB despite subjective satisfaction.

The result is instinctive satisfaction without a gain in speech comprehension, i.e. there is no ability to react to speech, as the brain does not receive any new information where this would be required.

With direct, neuronal transmission, as mostly carried out with the cochlea implant, the hearing performance is considerably higher as the system guarantees that the hearing signals are perceived across the whole signal path of the peripheral and central auditory pathway.

The process developed uses a similarly successful method to CI configuration.

Under new, realistic measuring conditions and using new measuring technology, the new process guarantees that a direct neuronal adaptation is performed on the patient, from the open headphones up to perception.

The audiometer is used only as a signal source and the calibrated norm desktop of the hearing aid is used for audiometric levelling (audiometer function) until the necessary hearing thresholds for signals that are barely perceptible, signals with a pleasant volume, and very loud signals at the limit of tolerance are clearly defined.

The entire hearing aid market is looking for a new measuring system to configure percentile-controlled hearing aids (see scientific comparisons of CI hearing aids) to provide the best possible, reproducible speech comprehension.

The new method achieves this aim by effecting a paradigm change to cortically reproducible perception.



Abstract EFAS/DGA 2007

The sales of hearing systems can be significantly increased with this system, this procedure and the new, linear, digital hearing aid products since basic customer needs for improved speech comprehension (where it is possible; not with dead areas) are met to a much greater degree of satisfaction. Rehabilitation work in the form of information and explanations (counselling) and audio-therapy or speech-therapy work will also be required.

The same methods have long been used in the cochlea implant configuration.

The further advantages are:

- Rapid success with reaction to speech by means of guaranteed, linear, static perception
- Other configuration measurements such as those performed by ENT doctors
- Reduction in the stock of hearing aids kept by audiologists
- Higher profit as only high-quality hearing systems are involved
- The transparency of hearing aid configuration is no longer just limited to the hearing aid, but includes services
- Meeting patient expectations to regain the ability to understand speech, rather than merely subjectively 'hearing' better.

Literatur:

Literaturhinweise

- DIE ZEIT zitiert am 8. Dezember 2005 u.a. PD. Gerhard Hesse, Arolsen und Jürgen Rehkopf
- PhD Blamy Zeitschrift für Audiologie 2/2006 Seite 72f
- Hörakustik 2/2006 Seite 42f
- Zeitschrift für Audiologie 2/2006 Seite 76 TEOAE und Linearität
- Interton Power- Point Präsentation ADRO
- Statistische Signalverteilung im Fuzzy- Algorithmus
- Mueller- Deile J, Versorgung mit Cochlear Implantaten, Sprache Stimme & Gehör, 2004; 04-28
- Ruhruniversität Bochum DGA- Tagung 2005 Postervortrag
- BIHA Downloadcenter „Offene Versorgungen“
- Die Ziele der DGA im Fachausschuss Hörgerätetechnik und Hörgeräteversorgung
- Forderungskatalog vom DHI (Deutsches Hörgeräteinstitut –Expertengruppe)
- Manfred Spitzer „Geist im Netz“ Seite 52ff
- Manfred Spitzer „Lernen“ Seite 86ff
- Tallal p, Miller SL „Language comprehension in language-learning impaired children improved with acoustically speech“ Seite 81ff
- Spiegel Spezial „Bewegung ist alles“ Seite 92ff
- Gerald Langner „Die zeitliche Signalverarbeitung im Hörsystem: Neuronale Grundlage für die Tonhöhenwahrnehmung und für ein künstliches Gehör“ aus: Thema Forschung (TUD) 2/99
- Arthur Schaub „Digitale Hörgeräte- was steckt dahinter?“ Median- Verlag Seite.74
- Spitzer. „Geist im Netz“ Seite 111

