AudioMC. The ultimate method for objective audiometric test

With only one test, gets the audiogram accurately and quickly without the cooperation of the patient and make an objective diagnosis in newborns and adults

Cochlear microphonics response are registered by two conventional surface electrodes placed behind the pinna (mastoid) and another one on the forehead. Data for each of the audiometric frequencies used in clinical procedures are obtained by a computer process reaches an identical audiometric profile obtained by conventional techniques. The system also provides a range of clinical information for the diagnosis of hearing disorders. All studies are performed without the cooperation of the patient, so it can be used even in premature newborns. The method provides fully reliable, as demonstrated in various hospitals in Madrid: Ramón y Cajal, La Paz, H. Clinico, among others. Given the extensive information obtained and the reliability of the system the results are superior to those obtained by other techniques, without increasing the cost of the studies. This solution has been developed by the Centre for Biomedical Technology at the Technical University of Madrid.

Technology solution supported by the Technical University of Madrid

Technology solution

Cochlear microphonics, are the response to sound stimulation of the auditory sensory receptors. Due to its small magnitude, they are difficult to register and for this reason, they are not currently used for diagnosis in clinical audiology.

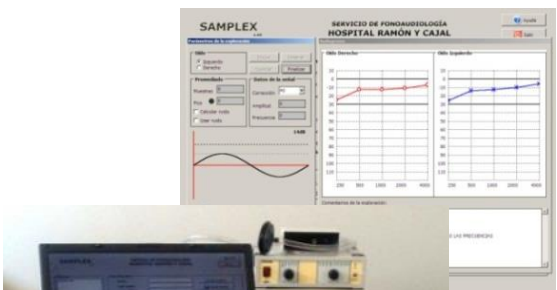
Our technique completely eliminates external perturbations that could mask these biological signals, achieving more accurate results than those obtained with other techniques. Besides the usual audiogram, the differential intensity level (recruitment) and other parameters and diagnostic audiological research interest is determined.

Areas of application

▪Health and ICT applied to health and personal care, specifically :

- Unresponsive patients: newborn and older children, cognitive unpaired people, even animals or patients for which the subjective method is not useful.
- Forensics: objective determination of hearing loss at work or caused by accidents or diseases.

"AudioMC make simple and reliable diagnosis of hearing disorders in neonates and patients with little or no responsiveness, which so far has not been achieved with other techniques""



Market demands

- **Children**
  - Even a mild or partial loss of hearing can affect a child's ability to speak and understand language. Hence, early diagnosis of hearing loss is crucial for the development of language, cognitive and psychosocial skills. However, until three or four years old, only objective screening methods are available with which it is not possible to obtain the required audiogram.
- **Cognitive impaired & older people**
  - Studies suggest that elderly people with compromised hearing are at risk of developing cognitive deficits — problems with memory and thinking — sooner than those whose hearing is intact.
- **Assurance Companies**
  - Sometimes doctors are under the obligation to emit reports about hearing damages due to illness or accidents, that generally will determine economic lendings or recongnition of discapacity. Objective test is needed independent of the opinion of employees, chiefs or governments.

Market potential

- More than 360 million people in the world have disabling hearing loss, according to the World Health Organization (WHO). One in three people over the age of 65 years (a total of 165 million people worldwide) have hearing loss.
- Hearing loss is strongly associated with aging, rapid growth in older population groups will cause the number of persons with hearing and balance impairments to increase markedly.
- In Spain, there are about one million people affected by hearing impairment (INE , 2000). Five out of every thousand newborn children have varying degrees of hearing loss (CODEPEH, 2000), and three of them will need prosthesis that should be prescribed as soon as possible.
- Without programs for early detection of congenital hearing loss, the average age of diagnosis is around three years old in the EU and USA, so these programs are needed to prevent future disturbances in language acquisition.
- The trend is to perform hearing screenings on all newborns allowing detection of infant hearing loss within the first month of life and diagnosis at 3 months to begin treatment as sooner as possible.

Competitive advantages

- The diagnosis is possible in cases for which now only screening are possible. So, therapeutic strategies like the use of audiphones are early possible, enlarging the market.
- The wide diagnostic spectrum of this objective method minimizes errors.
- The system contributes to the proper fitting of hearing aids.
- Simplifying diagnosis and providing more data, the technique could displace much of the studies performed today.
- Research on cochlear function acquires new perspectives on the possibility of extending the knowledge of sensory receptors.

"Our solution offers audiometric objective diagnosis in cases in which only screening is possible nowadays, in very few minutes and in a cost-effective way"

References

- The Centre for Biomedical Technology (CTB-UPM) brings together researchers from different disciplines on biomedical technologies in order address major challenges in Biomedicine and Health R&D
- Commitment to the development of biomedical technology and its transfer to the industry

Development stage

- ◯ Concept
- ◯ R & D
- ⊕ Lab Prototype
- ◯ Industrial Prototype
- ◯ Production

AudioMC contact
José Javier Serrano Olmedo
Center for Biomedical Technology
e: josejavier.serrano@ctb.upm.es

UPM contact
Innovation, Commercialization and Entrepreneurship Area
Centre of Support for Technological Innovation – UPM
e: innovacion.tecnologica@upm.es