

Editorial

Audiology and Phoniatrics: the presence and the future.

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In May 2022 Alessandro Martini published the Editorial of this journal “To be or not to be” (a physician in Audiology)? (and of course in phoniatrics). The author reported on the history of Audiology from its recognition as a medical branch to the present days (Martini A., 2022).

In Italy Audiology and Phoniatrics, as a medical specialty, is having difficult times mainly because of the lack of reimbursement of outpatient services directly to Audiology Clinics¹. This has led to the existence of few independent Audiology Clinics outside Otolaryngology Units. The scarcity of request of specialists in Audiology and Phoniatrics both in the public and private health system represent a risk for the elimination of the Post-Graduate Residency Program.

In front of these “political” issues the specialist in Audiology and Phoniatrics remains a pillar in the diagnosis and treatment of hearing, balance, voice, language and swallowing disorders in adults and children (Martini A., 2022) and the scientific and technological advancements of the last years have opened a window of opportunities for the both the health system and the specialty.

Recent scientific advancements in the field of Audiology have mainly interested two main fields: genetic hearing loss and age-related hearing loss. Gene therapy has emerged as an effective treatment of children affected by otoferlin related hearing loss in trials based in

USA, China and Europe (Qi J., 2024- Lv J., 2024- Brigande JV., 2024- Sensorion. 2024-

Nature, 2024) and other trials with different genes are in preparation. On the other end of the lifespan the ACHIEVE study has confirmed as hearing rehabilitation with hearing aids can reduce the cognitive change in hearing impaired individuals at risk for cognitive decline (Lin FR., 2023) opening the way to audiological screening programs of adults as well as proactive rehabilitation by hearing aids.

Professionals involved in Audiology have therefore to face new challenges in terms of hearing rehabilitation, in consideration of technological advances in wearables, over the counter (OTC) hearing aids, professional hearing aids and cochlear implants, as well as in tele-care and artificial intelligence approaches to audiological diagnosis and treatment (Mc Lean C, 2022).

The Future of Hearing Rehabilitation

Wearables are devices that can be worn and contain computer technology or connect to the internet. Wearables, like headphones—known as hearables—are increasingly adding features that improve or customize hearing for users and could be helpful for individuals with mild and perhaps moderate hearing loss, as well as for people with normal hearing who find themselves in difficult hearing environments. OTC hearing aids have been ap-

¹ Decree of the President of the Council of Ministers (DPCM) dated January 12, 2017. Official Gazette of the Italian Republic no. 21, January 26, 2017.

proved by the Food and Drug Administration² and are indicated for mild to moderate hearing loss (De Sousa KC., 2023). Recent research showed that OTC and prescription hearing aids are comparably safe, though OTC hearing aids are slightly less efficacious (Shah R., 2024). Despite this finding their accessibility and cost will probably increase the access of hearing-impaired individuals to hearing rehabilitation and therefore cognitive decline prevention. In front of 49.5 million adults in the United States with perceived mild-to-moderate hearing trouble (Humes LE.,2024) the hearing aid adoption rate is very low both in USA and Europe and does not exceed the 5% (Powers TA., 2022).

The need of hearing screening program has recently led to the publications of living guidelines for the improvement of the standard of care of adults with hearing loss and strategies for their implementation (Ramos-Macías Á., 2023). In this context the Italian Society of Audiology and Phoniatrics has organized scientific meetings in four geographical areas of the country to disseminate the recommendations in terms of adults hearing screening and access to cochlear implantation.

The Future of Telemedicine in Audiology and Phoniatrics

COVID-19 pandemic has increased the need of a telemedicine approach as well as its knowledge among professionals. Accumulating evidence suggests that tele-audiology is a viable service delivery model in terms of remote hearing screening, diagnostic testing, intervention, and rehabilitation. The proposed benefits of tele-audiology include improved access to care especially for patients living in underserved areas, increased follow-up rates, and reduced travel time and costs. Technological advancements have allowed and simplified tele-audiology services for patients with hearing loss in terms of diagnosis and treatment monitoring.

The French Society of Otorhinolaryngology-Head and neck Surgery has recently published their best practice recommendations

in tele-audiology (Thai-Van H., 2021) describing a clinical path that starts from video-otoscopy and end with audiological diagnosis. On the other end both hearing aids and cochlear implants can be remotely monitored and set according to the patients need. Remote check of cochlear implant is already the standard of care (Maruthurkkara S., 2022), while future studies will evaluate the role of distant programming of cochlear implants (Hughes ML, 2018).

Similarly in the last years telemedicine visits were implemented in patients with voice and swallowing related disorders. Choi et al (Choi JS., 2022) showed that concordance rates in diagnosis and management were high between the initial telemedicine visit and subsequent in-person visit with laryngoscopy introducing a new way of prioritizing clinical appointments (Montalbaron MB, 2023). Finally, the French Society of Phoniatrics and Laryngology recently published a consensus paper on tele-rehabilitation of voice disorders stressing the need of controlled studies to assess its feasibility, reliability, and the patient perception about telerehabilitation (Baudouin R., 2023).

The Future of Artificial Intelligence in Audiology and Phoniatrics

Artificial intelligence approaches in Audiology and Phoniatrics has the aim to develop statistical algorithm that learn from clinical data and help the clinician in diagnosis and therapy of medical disorders.

Machine learning approaches have been proposed for tinnitus diagnosis (Sadegh-Zadeh SA., 2024), prediction of sudden hearing loss prognosis (Aghakhani A., 2024) and auditory brainstem response analysis (Wimalathna H., 2022). All these studies showed promising results, however the authors of all these studies agreed that further researches are needed before these models can be applied in a real-world setting. In particular larger amount of data is necessary as well as

² Food and Drug Administration. Medical Devices; Ear, Nose, and Throat Devices; Establishing Over-the-Counter Hearing Aids. Department of Health and Human Services, Food and Drug Administration, Federal Register; 2023. <https://www.federalregister.gov/documents/2022/08/17/2022-17230/medical-...>

greater clinical cohorts that can better implement the system.

Similar approaches have been proposed in Phoniatrics and fully automated laryngeal glottis segmentation models have been implemented aimed at an automatization of the diagnosis of vocal cords movements and disorders (Groh R., 2022-Turkmen HI., 2019). Recently a similar approach has been applied to a dysphagia prediction model (Jauk S., 2023).

The future of Audiology and Phoniatrics stands in the knowledge of all these technological evolutions and their expansions. We know that we are facing with an aging and growing population that will need audiological and phoniatric care in terms of hearing, language and swallowing rehabilitation. It is up to us to recognize the opportunities, seize them, and educate ourselves in areas that appear to be challenging.

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