



Scientific  
and clinical  
activities and  
achievements  
in medicine

## **Prof. H. Skarżyński's scientific and clinical activities cover 41 years**

(1980–2021) and are very far-reaching. His achievements include many landmarks that are the milestones in Polish and global medicine. His significant achievements in this field involve contributing to the steady development of scientific and clinical cadres as:

- promoter of 30 doctoral theses in medicine and health sciences,
- formal and informal supervisor of 12 habilitation processes,
- partner in the scientific output of 8 collaborators who obtained professorates,
- supervisor of more than 100 specializations of 1<sup>st</sup> and 2<sup>nd</sup> degree in otolaryngology, otorhinolaryngology, audiology, audiology & phoniatrics, and pediatric otolaryngology.

**Pioneering cochlear implantation surgeries.** As **the first surgeon in Poland, prof. H. Skarżyński** conducted cochlear implant surgeries in the treatment of total deafness in adults and children (1992). He implanted **the first in Poland bone conduction implant** BAHA type in a child (1997), **auditory brainstem implant** (ABI) – in the fourth at that time country in the world (1998), **middle ear implant** - VSB (2003) - for treatment of different congenital and acquired cases of deafness and partial deafness. In 2008, together with scientists from Germany and Austria, he conducted **the first in the world bilateral implantation of a brainstem implant** (ABI).

Prof. H. Skarżyński has presented numerous hearing improving surgeries, particularly pioneering surgeries, 'live' in a dozen or so countries in Asia, Europe, and South America. Until the present day, he has conducted in the World Hearing Center in Kajetany **more than 1.3 thousand transmitted surgeries that had an audience of more than 4.5 thousand specialists** from all continents. Since 2008, he has been one of the presenting surgeons in the global surgical broadcasts of the LION – Live International Otolaryngology Network – performing demonstration surgeries followed 'live' by the audience worldwide. Altogether, prof. H. Skarżyński has **performed more than 215 thousand different hearing improving surgeries**; for more than 20 years, he has been performing the largest number of such surgeries in the world.

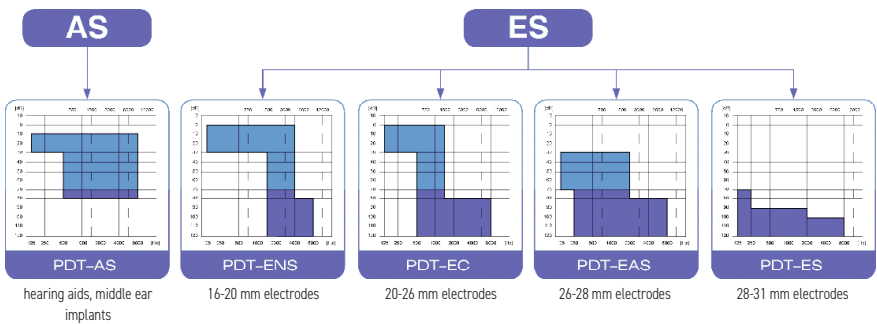


The first in Poland cochlear implantation in a deaf person performed by ass. prof. Henryk Skarżyński



International BONEBRIDGE & SOUNBRIDGE Symposium. Prof. Henryk Skarżyński with the team performing the first in the world surgery of a new type of Vibrant Soundbridge implant with LP-Coupler. Transmission from the surgical theatre to the Atrium hall of the World Hearing Center (2017)

**Partial deafness treatment - PDT.** Prof. H. Skarżyński has developed a novel on a global scale method to preserve preoperative residual hearing and treat partial deafness (1997). As early as in 1997, during the V International Cochlear Implant Conference in New York, he presented the first premises of preservation of the residual hearing and electric and acoustic stimulation in the same ear. In 2000, he presented **the first groups of children and adults** treated for this hearing impairment at the European congress of EUFOS in Berlin and the European conference ESPCI in Antwerp. Later, as the first surgeon in the world, he started operating on adults (since 2002) and children (since 2004) with classic partial deafness in which good hearing is preserved up to 500 Hz, and the rest of the frequency range is completed by electric stimulation through the cochlear implant (partial deafness treatment – electric complementation PDT-EC). Then, he performed **the first in the world surgeries combining electric with natural hearing preserved up to 1500 Hz** (since 2009) – partial deafness electro-natural stimulation PDT-ENS, thus widening the hitherto standing indications for cochlear implantation to include millions of new patients, particularly seniors – the ever-growing group in the contemporary society. His innovatory on the international scale achievements included the elaboration of a surgical method – **“Skarzynski’s 6-step method”** with a selection of appropriate implant electrodes, including an electrode designed by Skarżyński, and the method of assessment of the postoperative hearing preservation by Skarzynski et al. In 2010, **he published the first in the world, comprehensive concept of treatment of different kinds of hearing disorders with classic hearing aids and various hearing implants.** In 2014, he presented the updated version allowing for combining



The present concept of the partial deafness treatment according to Skarżyński (2014)

the natural and electric hearing. Based on the largest on the global scale clinical material (more than 5 thousand patients), he presented the newest classification of the treatment of partial deafness that allows for the subsequent changes of the natural hearing both in the operated and in the contralateral ear – PDT-EMS (partial deafness – electric modified stimulation). In the following years (2012–2020), as the first in Poland or the world, he introduced to the clinical practice the next types and generations of the



Interview with prof. Henryk Skarżyński (2008)

cochlear, middle ear, and bone conduction implants: Vibrant Soundbridge with various attachments, Codacs, Baha Attract, MET, Bonebridge BCI601, and BCI602, and Cochlear Osia 100 (with prof. Piotr H. Skarżyński).

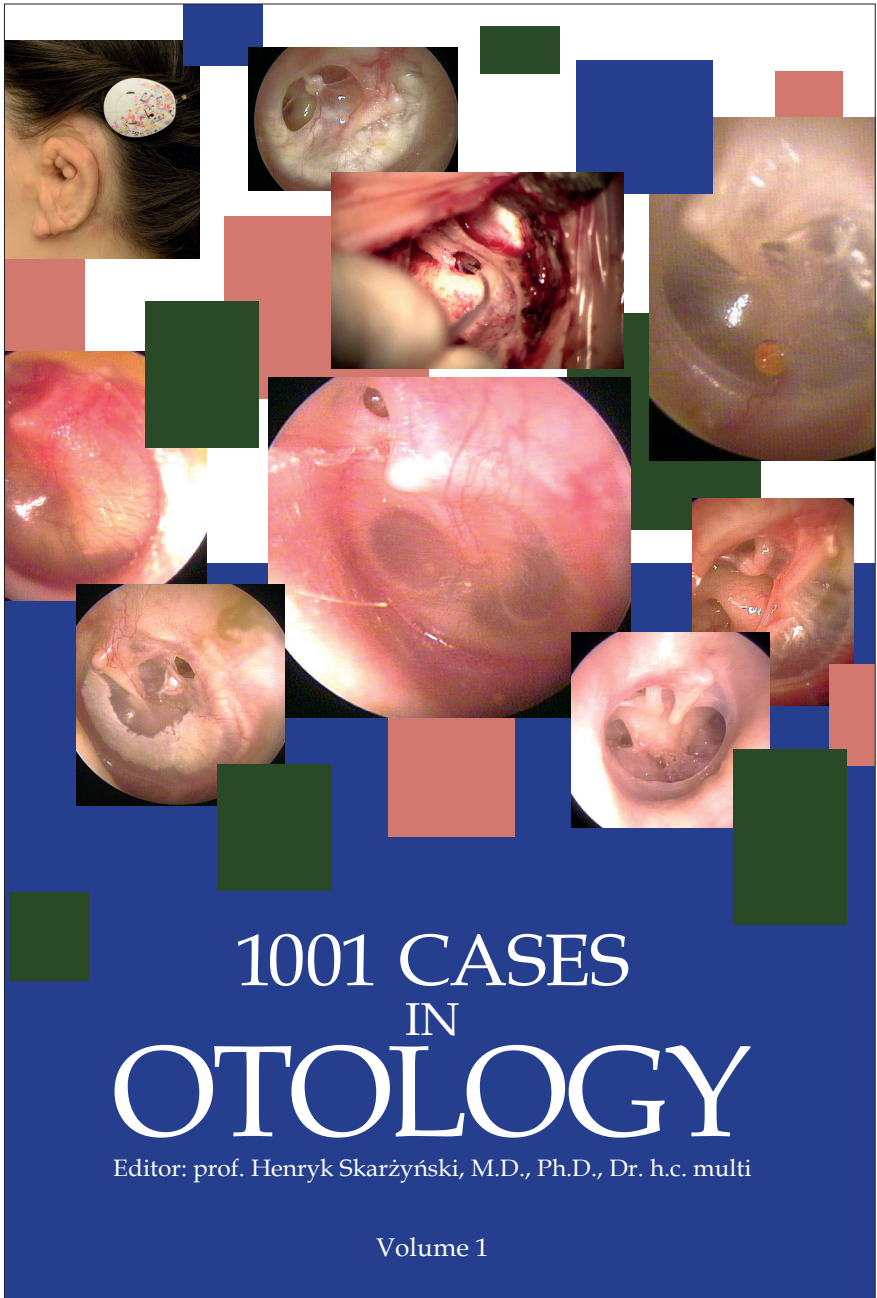
**Innovatory clinical solutions.** Prof. H. Skarżyński is a leader in innovative solutions supporting diagnostics, treatment, and rehabilitation of hearing. He is the author and co-author of multiple **patents and new implantable devices** such as a cochlear implant electrode for treatment of partial deafness (commercially implemented by the largest producer of cochlear implants) and the Skarżyński middle ear prosthesis. In the field of ear surgery, he has authored novel methods and procedures for reconstructive surgery of the middle and outer ear, introduced into clinical practice in many parts of the world. He is an author of **the first in the world tool for assessing the results of partial deafness treatment (Skarżyński et al. scale)** and has developed the Skarzynski's method for evaluating surgical treatment of congenital ear malformations and Skarzynski's scale for evaluating the effects of tinnitus therapy. He is the author and co-author of devices and multimedia programs for screening tests of hearing, vision, and speech, including the first in the world diagnostic equipment for remote testing of hearing, speech, and vision ("I Can Hear," "I Can Speak," "I Can See"), and a device for comprehensive testing of hearing, vision, taste, smell, balance, and voice,

5



Prosthesis made according to the idea of prof. H. Skarżyński

in-the-clinic or through the internet – the Sensory Examination Capsule. He authored **more than 150 novel clinical solutions** that have contributed to the development of hearing implants, otology, ear surgery, audiology, and hearing rehabilitation in Poland and abroad.



The cover of the book "1001 Cases in Otolology" (2019)

The author of the Polish school in otology and otosurgery in the world's science and medicine, particularly concerning the treatment of partial deafness with cochlear implants, innovative applications of middle ear implants, reconstructive middle ear surgery, and surgical treatment of congenital ear malformations. He has elaborated an all-encompassing concept of treatment of different types of deafness, including the surgical method and specially designed cochlear implant electrodes. He has proved the long-term clinical effects of that treatment on the largest in



An interview with prof. Henryk Skarżyński (2011)



the world group of operated patients. **Presently, he has the largest in the world clinical material and scientific output (publications and congress presentations in this topic count up to over 3500 positions).**

**Research and implementation activities** conducted under the leadership and with the participation of prof. H. Skarżyński **are focused on otorhinolaryngology in children and adults, otology, ear surgery, audiology, phoniatics, rehabilitation, clinical engineering, and related specialties and fields.** They concern in particular: early detection of hearing impairments in newborns and infants, treatment of different hearing disorders including total and partial deafness, application of new solutions in active and passive hearing prostheses, new methods and technologies in reconstructive ear surgery and audiology, including telemedicine for telediagnosics, telefitting, and telerehabilitation. Prof. H. Skarżyński's scientific interests also include such topics as fMRI studies of the hearing system, diagnostics of sensory organs, tinnitus, music therapy supporting the rehabilitation of different hearing disorders, particularly in patients using hearing implants, and many others.

**Early detection of hearing impairments** one of the priorities of prof. H. Skarżyński's research and social works. In the years 1993–1998, he developed the research programs on early detection of hearing impairments in newborns. They have demonstrated that the rate of hearing problems in that group is significant, **making an immense contribution to Poland's implementation in 1998 – as one of the first European countries – of the program of universal hearing screening in newborns.** In 1998, prof. H. Skarżyński has been the Polish signatory of the European Consensus Statement on Neonatal Hearing Screening signed in Milan, Italy. He initiated the subsequent Polish programs of early detection of hearing disorders in children beginning school education in 1999. Later, in the years 2007–2021, hearing screening programs have encompassed **the whole population of first-graders from rural communities and small towns in Poland.** In the years 2017–2019, the entire population of first graders in the Mazovia region has been included in hearing screening tests – **it was the first such region globally.** On the initiative of prof. H.



Prof. Henryk Skarżyński and ass. prof. Piotr H. Skarżyński during the hearing screening examinations of children in Rwanda

Skarżyński, in the years 2010–2021, hearing screening tests have also been performed in over 20 countries in Europe, Asia, Africa, and South America. Altogether, they have involved **more than 1.5 million children**.

**Activities in the field of health and social policies.** Prof. H. Skarżyński has initiated several **programs influencing the health and social policies in the European Union**. During the Polish Presidency in the EU in 2011, he started and coordinated the scientific and organizational works re-



Signatories of the European scientific consensus on hearing screening in school-age children. From the left: ass. prof. Jacek P. Szaflik, prof. Antoinette am Zehnoff-Dinesen, Michele Kaufmann-Meyer, prof. Linda Luxon, minister of health Ewa Kopacz and prof. Henryk Skarżyński (2011)



Informal meeting of Ministers of Health of the European Union countries in Sopot. Lecture of prof. Henryk Skarżyński on equal opportunities for children with communication disorders in European countries (2011)

lated to the program "Equal opportunities for children with communication disorders in European countries," which he had put forward and which has become a main **priority of the Polish Presidency in the area of health**. A leading achievement of these activities has been the adoption, by the representatives of all European national scientific societies and European federations of audiologists, phoniatricians and speech therapists, as well as the European ophthalmology expert group, of the



An interview with prof. Henryk Skarżyński (2011)

important international documents: the **European Consensus Statement on Hearing, Vision and Speech Screening in Pre-School and School-Age Children** and the **European Consensus Statement on Hearing Screening of Pre-School and School-age Children**. These documents were signed (in Warsaw on 22 June 2011). The next important document, signed thanks to the initiative and involvement of prof. H. Skarżyński was the **“EU Council Conclusions on Early Detection and Treatment of Communication Disorders in Children, Including the Use of e-Health Tools and Innovative Solutions”** signed in Brussels on 2 December 2011. That document was adopted following the recommendation of the Ministers of Health of the EU, to whom prof. H. Skarżyński has presented the program of early detection of hearing, vision, and speech disorders during the meeting of the EU Ministers of Health in Sopot on 5–6 July 2011.

**Organization of the first in the world National Network of Teleaudiology.** In 2000, prof. H. Skarżyński had conducted **the first in the regular clinical practice teleconsultations in otorhinolaryngology, audiology, and rehabilitation**. The program – based on the application of



the newest achievements and possibilities of telemedicine – has been subsequently extended to include, in 2004, the original, first in the world “Home Rehabilitation Clinic” for remote rehabilitation of hearing in patients provided with different types of hearing implants. In 2007, modern telemedicine was enriched by the first in world program of remote fitting of cochlear implants – telefitting. These two innovative programs won the main award in the 21<sup>st</sup> Century Achievement

Award in the Computerworld Honors Program in Washington in 2010 and the Prix Galien Award in Monte Carlo (Monaco) in 2014 – considered in the field to be comparable to the Nobel Prize.

**National and international research projects.** Prof. H. Skarżyński has been the **leader and chief executor of more than 100 different national and international research projects** – research grants, targeted

programs of the Ministry of Science and Higher Education, Ministry of Health, State Committee for Scientific Research, National Science Centre, National Centre for Research and Development and others. The most important projects were:

- New materials for reconstructive ear surgery (1993);
- Program of aid for people with hearing impairments in (1994);
- Program "Development of standards for screening tests aimed at early



An interview with prof. Henryk Skarżyński (2011)



The Sense Examination Platform designed by prof. H. Skarżyński et al.

- detection of hearing disorders in newborns and infants” (1995–1998);
- The international research program “Concerted Action on Otoemissions” (1996);
- Project “New methods of diagnostics and treatment of hearing disorders using the technology of digital processing of a phonic signal” (1996);
- The targeted program “Creation of the National Center of Tinnitus” (1997–2000);
- Programs for early detection of disorders of hearing, vision, and speech (“I Can Hear,” “I Can Speak,” “I Can See”) developed in collaboration with the team from the Gdansk University of Technology led by prof. Andrzej Czyżewski (1998-2000);
- Projects applying innovative tools for conducting screening tests aimed at early detection of hearing disorders in children starting school education (2000-2019);
- Program of treatment of different types of partial deafness and construction of infrastructure for the World Hearing Center (2008–2012);
- Creation of the first in the world National Network of Teleaudiology



The Sensory Examination Capsule and a humanoid robot (2019)

(2007–2010);

- “Integrated system of tools for diagnostics and telerehabilitation of sensory organs’ disorders – hearing, vision, speech, balance, taste, smell” (2010–2018);
- Sense Examination Platform for testing hearing, vision, and speech (2010);
- Sensory Examination Capsule for testing hearing, vision, balance, taste, and smell (2018).

**International collaboration for medical development.** From the very start of his professional life, prof. H. Skarżyński undertakes actions aimed at establishing international and national collaboration for health care and promotion and disease prevention employing novel diagnostic



and treatment techniques. Scientific collaboration also involves education, including scientific exchange, organization of training, conferences, and workshops, exchanging experiences with other experts. One of the most crucial international actions has been **initiating, together with the scientists from Innsbruck, Vienna, Wurzburg, Frankfurt, and Antwerp, the creation of the worldwide network of modern otology and audiology centers – HEARRING** that comprises today 33 leading centers in Europe, both Americas, Asia, and Australia. The group creates and conducts joint research programs, major clinical implementations, and expert training system, also at the yearly conferences organized on different continents. The HEARRING group regularly elaborates and implements guidelines and recommendations for applying the newest technologies, criteria for selecting the new target groups of patients for treatment with different implantable systems, hearing monitoring programs, and applications of the latest telemedical solutions.



The first meeting of the HEARRING group in Kajetany, attended by the representatives of hearing implant centers from the whole world (2009)

