Standards of practice in the field of hearing implants

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HEARRING quality standards: an Introduction

In 2005 the World Health Organization estimated that approximately 278 million people suffered from 'moderate to profound hearing impairment,' 80% of whom lived in low- and middle-income countries (WHO, 2010) where there is less access to competent medical professionals and modern medical procedures and technologies than in high-income countries. Furthermore, with the ageing populations in the developed world (United Nations, 2010) and their associated age-related hearing-loss (presbycusis), the need for assisted hearing solutions – even taking into account a hopefully broader application of preventive measures (e.g. rubella immunization, health education, quieter workplaces, etc.) and health-care infrastructure development – is clearly both significant and continued.

One of such possible hearing solutions is hearing implantation. Indeed, as of December 2010, approximately 219 000 people have been implanted, either uni- or bilaterally (National Institute on Deafness and Other Communication Disorders, 2011). As significant as the benefits of cochlear or middle ear implantation have been for recipients and their families, such implantation is still in its demographic infancy, serving a negligible fraction of those whom

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it could, and will, help integrate or reintegrate into the verbal bustle of everyday life and work.

'The best clinics – providing the best for the patient and comprehensive care' (HEARRING, 2012). With this motto, renowned specialists of four leading hearing implant centers formed the HEARRING group in 2008. Inspired by the collaborative nature of comprehensive cancer center networks, they sought a closer network to better pool their expertise and share information instead of relying solely on medical literature and – beneficial as they are – the individual personal contacts that medical congresses and conferences provide. In the following years, other centers from around the world have joined HEARRING: as of 2012, 23 clinics with numerous surgeons, audiologists, rehabilitationists, and other skilled professionals are collaborating under the HEARRING umbrella.

The 23 clinics in the HEARRING network are committed to creating and maintaining the highest standards of quality. We believe that consensus- and evidenced-based standards are essential to providing each potential implant user, regardless of age or where in the world he/she is treated, with the best possible hearing implant solution for the treatment of her/his individual hearing loss.

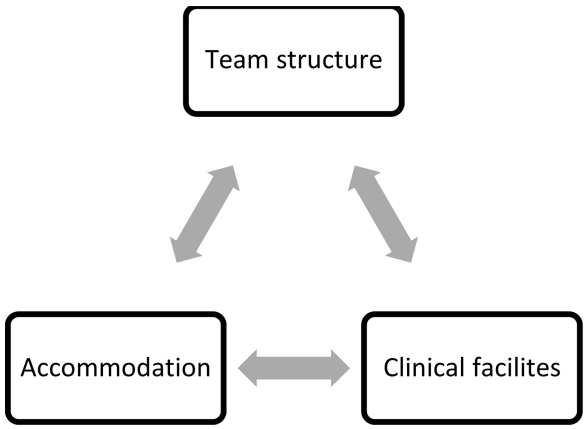
In order to try to ensure the best outcomes and the highest safety levels for every present or potential implant user in every clinic, the HEARRING group – under the direction of experts Prof. Christopher H. Raine, MD, Prof. Dr Rudolf Hagen, Prof. Dr Joachim Müller, Prof. Dr Benoit Godey, and Jane Martin – has created a series of standards that covers all aspects of the hearing implant solution process. These quality standards are based on the British Cochlear Implant Group's (BCIG) own quality standards and can be considered current best practice; indeed they have been approved and adopted by participating HEARRING clinics. These standards are not, however, a static picture; as technology and treatment options continually develop, these standards will be continually updated.

The BCIG was founded in 1989 – not long after implantation became common – to promote good practice and provide information and advice to professionals and the public on cochlear implant solutions. They, with the Royal National Institute for the Deaf, published 'Quality Standards for Adult Cochlear Implantation' (British Cochlear Implant Group and Royal National Institute for the Deaf, 2009), a series of 16 guidelines that are meant to be the *minimum* and *realistically achievable* baseline standards for clinics. HEARRING has used this original document as a blueprint for developing a series of six related sets of evidence-based standards, each tailored to fit a specific age category or procedure:

1. Quality standards for adult cochlear implantation
2. Quality standards for cochlear implantation in children and young adults
3. Quality standards for combined electric and acoustic stimulation (EAS)
4. Quality standards for middle ear implantation (MEI)
5. Quality standards for rehabilitation
6. Quality standards for minimal outcome measurements in adults and children.

With some slight variation (see Table 1), each set of standards has the same basic structure which can be divided into two subsections: (1) resources and (2) processes.

Resources: The Resources section is made up of three parts: team structure, accomodation, and clinical facilities.



Team structure outlines who every cochlear implant team should include and the minimum training and/or experience each member should have. It also describes the importance of establishing and maintaining a program of continued professional development: with national or international courses, conferences, and meetings each team member should be up to date with the latest cochlear implantation-related developments. Extending beyond the core team, this section also provides a list of 'additional support' professionals whose expertize need not be part of a core team but whom the core team should have ready access to if necessary.

Accommodation is about the provision and differentiation of the clinic's physical space: the size, suitability, comfort, and privacy of areas designated for staff, present or potential implant users, and waiting relatives. As different cultures have different spatial expectations and comforts, the HEARRING standards do not prescribe specific sizes but rather those that are 'suitable', 'sufficient', and 'large enough to comfortable accommodate'. Accomodation is also about access and communication. It covers providing the present or potential implant user with suitable

Table 1 The structural variations by Quality Standard

	Quality Standards for					
	Adult Cochlear Implantation	Cochlear Implantation in Children and Young Adults	Combined Electric and Acoustic Stimulation	Middle Ear Implantation	(Re)habilitation	Minimal Outcome Measurements
			Symbols: = equal	***≠ differs***	***+ in addition***	***– without (compared to basic document)***
Introduction	Individualized	=	Individualized	Individualized	Individualized	Individualized
Structure	Basic document	+ min of two surgeons, audiovestibular physician/ pediatrician, key worker, education, pediatrics	+ hearing aid acoustician – audiological medicine	– clinical scientists, physiologists, rehab therapists, speech and language therapists, clinical physiologists, engineers, tinnitus, balance, medical physics, genetic counseling, interpreter services, social services for the deaf, deaf advocacy	+ teacher of the deaf, key worker, parents, hearing aid acoustician, audiovestibular physician, cooperation with other services – otologist, audiologists, physiologists	NO
Accommodation	Basic document	+ suitable and family-friendly facilities	=	=	=	NO
Clinical Facilities	Basic document	+ spatial awareness	=	– OAE, electrically evoked potentials, balance function testing	NO	NO
Referral and Selection Criteria	CI selection criteria	CI in children/young adults selection criteria	EAS selection criteria	MEI selection criteria	NO	NO
Assessment Process	Basic document	+ ophthalmic assessment, family support and education, associated organizations, final outcome ≠ receptive skills assessment	+ APHAB test	12 weeks – referral for balance testing and genetic counseling, necessity for vaccination (meningitis), determination of UCL, hearing aid testing, electrically evoked response audiometry, promontory stimulation testing, OAE, details for communication, bilateral candidate assessment	≠ structure and content, children and adults are discussed separately – includes pre-op counseling	≠ describes basic sets of outcome measures to be used at routine visits for adults and children
Cooperation with Other Services	Basic document	+ newborn hearing screening	=	NO	NO (included in previous chapter)	NO
Pre-op Information and Counseling	Basic document	+ involvement of child, device	=	=	NO (included in previous chapter)	NO
Device	CI	NO (included in previous chapter)	EAS	MEI	NO	CI, but also applicable to other hearing implants
Surgery and In-patient Care	Basic document	+ monitoring of anesthetics and facial nerve – discussion of surgical procedure	=	– preservation of hearing, radiological examination	NO	NO
Fitting and Tuning	Basic document	+ electrophysiological measurements in the very young	=	+ rehabilitation	NO	NO

Continued

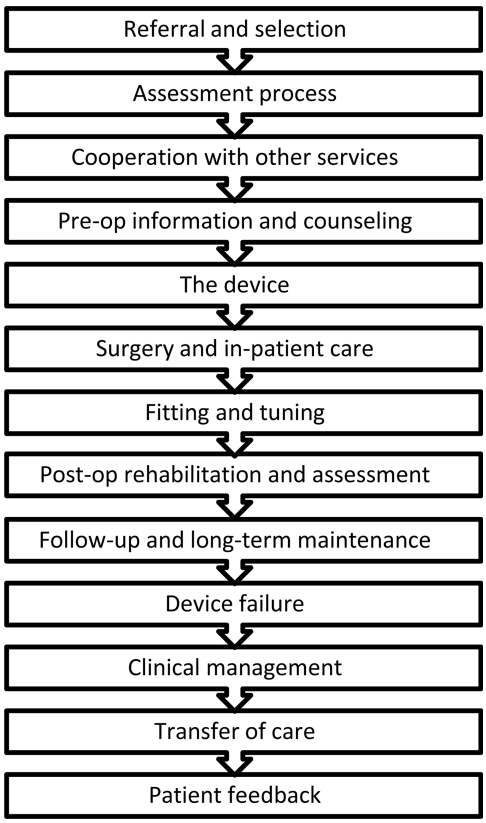
Table 1 ***Continued***

	Quality Standards for						
	Adult Cochlear Implantation	Cochlear Implantation in Children and Young Adults	Combined Electric and Acoustic Stimulation	Middle Ear Implantation		(Re)habilitation	Minimal Outcome Measurements
			Symbols: = equal	***≠ differs***	***+ in addition***	***– without (compared to basic document)***	
Post-op Rehabilitation and Assessment	Basic document	– lip reading, hearing tactics	=	– rehabilitation (included in previous chapter) ≠ post-op assessment		≠ structure and content, children and adults are discussed separately	NO
Follow-up and Long-term Maintenance	Basic document	+ assessment of FM systems	=	=		NO	NO
Device Failure	Basic document	=	+ detailed audiological reevaluation, consideration of a CI	=		=	NO
Clinical Management	Basic document	=	=	=		NO	NO
Transfer of Care	Basic document	=	NO	=		=	NO
Patient Feedback	Basic document	=	=	=		NO	NO

[1]The Quality Standards for Minimal Outcome Measurements in Adults and Children were based on the core elements of the other standards, and in itself describes procedural elements for routine assessment and reporting.

telecommuncations access to the clinic and, while in the clinic, with assistive listening devices and alerts.

As the name would suggest, the clinical facilities section outlines which technology should be available to be able to perform a variety of tests. Further, this section highlights the need to regularly calibrate instruments to nationally recognized standards.



Processes:

The clinics and professionals of the HEARRING network believe that providing users with individualized hearing solutions is a careful and detailed process that does not start and stop at surgical implantation. Each of the individual 13 steps is subdivided to provide more specific and in-depth guidelines. Taken together, the cumulative effect is a wealth of best-practice detail which covers every step of the implant experience from selection criteria to long-term maintenance.

The aforementioned six quality standards are published in full on the forthcoming pages followed by a table highlighting the key differences between the standards. It is the HEARRING group's hope that a wide adoption and implantation of these standards will lead to still a greater delivery of the highest quality comprehensive care and thus happier, better hearing implant users.

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