BIAP Recommendation 06/12:

Earmoulds for newborn infants and young children

Foreword

This document presents a Recommendation by the International Bureau for Audiophonology BIAP.

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Comments on this document are welcome and should be sent to the Secretary General of the International Bureau for Audiophonology BIAP. The address can be found on the BIAP website at www.biap.org.

Introduction

The anatomy and physiology of the ear makes it tricky to take aural impressions and produce earmoulds for newborn infants and young children. Impression-taking and production differs widely from the procedure followed in adults.

Recommendation

1. Impression-taking

The flexibility of the ear cartilage and its resistance to pressure must be taken into consideration. The earmould should exert as little pressure as possible on the tissues of the outer ear and the ear canal in order to avoid excessive dilatation of the external auditory canal.

It is also essential to bear in mind that movements of the lower jaw during breast-feeding, sucking, babbling, etc., alter the cartilaginous part of the external auditory canal.

As the newborn infant grows, the earmould will need to be replaced frequently; in the beginning, replacement may sometimes be required every few weeks.

2. Acoustic characteristics of the earmould

Newborn infants have a shorter ear canal which is very narrow and changes rapidly. This limits the acoustic possibilities (venting, gain, Libby Horn, etc.) and affects the residual cavity, which is much smaller than in adults. This particularly results in greater sound pressure in front of the eardrum.

When a powerful hearing aid is being fitted, tightness of the earmould is even more difficult to achieve than in adults.

The proximity of the microphone to the pinna, in particular, makes the acoustic feedback (Larsen effect) more likely. The reduced size of the pinna and the positions that are specific to a newborn (lying in bed, often being held in someone's arms, wearing a bonnet, etc.) contributes to this effect.

APPLICATIONS :

1- Impression-taking

- Inspect the whole ear - otoscope and appropriate accessories
- Take the impression with material of a smooth consistency and soft viscosity
- Use impression gun with cannulas which fits to the dimensions of the ear canal
- When taking the impression, be extremely careful to protect the eardrum (cotton block)
- Contrary to other recommendations, do not place a hearing aid behind the pinna. This could later cause a leakage between the earmould and the concha of the ear because the pinna still lacks rigidity.

2- Requirements for earmould production material

- Age-dependent (see appendix)
- Hypoallergenic material (see appendix)
- Never use a cold-curing system (see appendix)
- Soft earmould (see appendix)

3- Earmould shapes and colours

Suited to the child

4- Acoustic and attachment requirements

The selection and adjustment of the earmould and the sound tube must be perfectly matched to the anatomy of the child's ear.

- The earmould should extend past the second bend and the acoustic output should be centred and directed towards the eardrum.
- It is essential not to alter the shape of the soft earmould with the sound tube, especially the part inserted into the ear canal.
- The outer part of the tubing needs to be adapted to the child's anatomy.

5- Quality control

- It is advisable to communicate with the laboratories carrying out the earmould production. They must have technicians who are competent to produce earmoulds for babies and small children.

- Each earmould must be quality controlled before being dispensed by a paediatric hearing aid specialist. Only an earmould that meets the optimum conditions should be used.
- Fitting an earmould is a procedure that must be performed by a hearing care professional who is competent in paediatric hearing aid provision.
- If acoustical feedback is noted at the time of dispensing or by the child's parents, it is useful to take measurements of the tightness of the earmould using the feedback measurement integrated into hearing aids or using special equipment (such as that used, for instance, to check the effectiveness of anti-noise protection). As a result it is possible to identify the physical limit in terms of earmould tightness. If necessary, the earmould will have to be replaced.

6- Follow-up and fitting a new hearing instrument and/or earmould

- In view of the child's growth, the fit, the shape and the quality of the earmould must be checked regularly.
- Take RECD measurements (very important) when performing fine adjustment.

7- Use and care

- Parents need theoretical and practical instruction on how to put in place, manage, check and maintain the earmould and the hearing instrument.
- Provide a set of products required for maintenance: air blower, high pressure spray, drying and cleaning tablets, cream, stetoclip with or without filter, etc.
- Ensure educational staff (child care worker, teachers, etc.) also receive instruction.

8- Special earmoulds

- Earmoulds for a cochlear implant processor
- Cradle to keep a behind-the-ear hearing aid stable

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This recommendation was created and approved in multidisciplinary cooperation between professionals of all audiophonologic disciplines, which are medicine, pedagogy, speech therapy, psychology and hearing instrument audiology.

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