



## Assessment of children with complex needs

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# Werner-Otto-Institut

## Social Pediatric Centre

### Dep. of Phoniatics and Pediatric Audiology

Centre for diagnostic and therapy of children with a disability or who might get a disability

The team:

- Pediatric Neurologists
- Phoniaticians and Pediatric Audiologists
- Psychologists
- Speech therapists
- Occupational therapists
- Physiotherapists
- Special Pedagogues
- Family therapist
- Nurses, Social worker



# Additional family, social and medical strains of hearing impaired children with multiple handicaps

## Medical:

- possibly a stressful pregnancy
- difficult birth
- life threatening postnatal conditions
- ongoing serious medical conditions
- time consuming therapy and diagnostic appointments

## Psychosocial and family:

- Deep grieving process,
- long way before achieving some acceptance
- difficult or even pathological mother-child interaction
- siblings lacking parental attention
- stressed partnership

# Diagnostic difficulties

of hearing impaired children with multiple handicaps

- middle ear problems
- malformations
- greater discrepancies between ABR-threshold and "real"-threshold
- reliable subjective thresholds are often obtained significantly later
  - cognitive and motor developmental deficits
  - attention deficits and prolonged reaction time
  - some audiometry procedures not applicable
- Multi-handicapped children are unique in their interests and often highly selective in their reactions



# VRA and alternative approaches

for hearing impaired children with multiple handicaps

- **VRA**
  - animated toys and video
  - VRA can be insufficient
  - big revolving lights might work better
- **Air-Puff**

Conditioning Procedure using puffs of compressed air
- **TROCA**

Tangible Reinforcement Operant Conditioned Audiometry
- **Touch-Trainer**

Tactile Auditory Conditioning Procedure for the Hearing Assessment of Persons with Autism and Mental Retardation



There is a need for more commercially available testing equipment for multi-handicapped children



# Air-Puff and Touch-Trainer



# Implications for audiological assessment

- For any audiological assessment **it is crucial to listen to the parents**, trying to elicit any change of behavior to sounds:
  - Ask about sounds that typically occur in the surroundings of a young child,
  - does the child react to the voice,
  - does it startle to certain sounds
- **Ask about and observe the visual and motor abilities of the child**
- Use the information from the parents to select your approach
- Adapt your audiometric procedures to the developmental age of the child
- Try to position the child in a adequate way
- **Always try to include the sounds, the child seems to respond to at home**

# Implications for audiological assessment

- Always try to confirm your “subjective” results with some “objective” data (OAE, ABR)
- Look for any discrepancies between your subjective and objective results and the anamnesis
- Video-document the reactions of the child to the “test”-sounds, especially if they contradict the objective results
- Two examiners observe more than one!
- Never rely on one testing, always confirm your results by a regular re-assessment
- Establish a professional network that allows a routinely exchange of observations and information about the child
- Stay open minded for any “surprising” results at a second appointment



# Case - Example

- NHS pediatric clinic: A-ABR: r. fail; l. pass??
- First consultation WOI (3 m):
  - inspection: ear canal very narrow
  - tympanogram: 220Hz questionable maximums
  - TEOAE both sides fail;
  - Click-ABR: both sides potentials up to 60dB, threshold ~ 45dB
  - Notch-Noise-ABR: both sides 500Hz +1000Hz pot. up to 60dB
  - Observational audiometry: warble tones 500-4000Hz 70-90dB, broadband music 65dB

diagnosis: chromosome abnormality (unbalanced translokation Chr.I)  
hydrocephalus internus with corpus callosum agenesis  
epilepsy  
bilateral mixed hearing loss  
severe visual impairment

  - Procedere: audiogram control in 4 month

## Case – Example (II)

- 5 m: hearing reaction to: BOEL-bells, Manchester rattle  
ongoing seizures, mother desperate
- 7 m: reactions to music box + speech, startle response
- 8 m: infection, seizures, flat tympanogram: ABR postponed
- 9 m: click-ABR: threshold ~ 50dB; observational aud.: 60-70dB  
- start of a hearing aid trail, early intervention
- 11 m: hearing aids accepted, audiometry no results, mother hardly coping, epilepsy treatment higher priority
- 13 m, 18 m: like 11 m; 20 m: date cancelled, acute illness
- 21 m: recognizes well known sounds, voices, music  
reactions without h.a.: music 60-70dB; with h.a.: 30dB  
ear wax removal every 3 weeks necessary
- 30 m: conditioning with „air-puff“-audiometry
- now 10 y: reactions without h.a.: music 40dB, says yes/no, selects from 2 objects, happy at a school for mentally h., mother relaxed, important to come

# Relevant aspects from the case history

It can be very difficult:

- for the family
  - to squeeze any additional appointment in their never ending medical and therapeutic timetable
  - to stay in contact with the audiological team
  - to participate in any rehabilitation effort
- for the professionals:
  - to find enough opportunities (appointments) to establish any reliable degree of certainty with the diagnosis
  - to determine whether and when to start a hearing aid fitting
  - to evaluate any hearing aid benefit
  - to find the appropriate approach for enrolling the family in an auditory rehabilitation program

# Expectations conc. the fitting of hearing aids to hearing impaired children with multiple handicaps

Often spoken language can be only a very long-term goal,

therefore the primary aim of fitting hearing aids will be that the child is:

- acoustically reachable
- positive acoustic experiences
- achieving acceptance of the hearing aids
- promoting some communication

# Considerations conc. the fitting of hearing aids to hearing impaired children with multiple handicaps

## Two different points of view:

- The effects of a hearing loss multiplies with any additional handicap,  
therefore even minimal hearing losses require treatment?
- Multi-handicapped children are treated differently by their environment and their acoustic processing capabilities are often limited
  - they rely more on a one to one interaction
  - they can get acoustically “overloaded” more easily  
so amplification should be supplied with more caution?



# Conclusions conc. the benefit of h.a.

Hearing aid fitting to multihandicapped children

## Procedures

- focusing the fitting on a shorter distance input
- Using a more “comfortable” setting of the h.a. with a bit less gain and slightly reduced maximum output levels
- solving feedback, solving retention,
- providing protection of the hearing aid,
- ensuring proper hearing aid checks by the parents
- involving the parents and modulating their expectations
- working in a multi-professional team

# Conclusions

Keep in mind that sometimes even a severe hearing loss is not the most urgent problem of this child or this family  
(but make sure to stay in touch!)

Caring for hearing impaired children with multiple handicaps is a multidisciplinary team approach including the family

Families should find some joy and hope with their child – like Anne's mother, but that may take even some years

# Thank you for listening



**Thank you  
to the parents and the  
multi-professional team  
in Hamburg**

