Cochlear Implant Therapy Concept

- German Hearing Center (DHZ) – a part of the ENT-Clinic MHH

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# The ENT Department in figures

<table>
<thead>
<tr>
<th><strong>Wards:</strong></th>
<th>3</th>
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<tbody>
<tr>
<td><strong>Beds:</strong></td>
<td>96</td>
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</tbody>
</table>
| **Patients:** | 25,000 outpatients (each year)  
6,000 inpatients |
| **Staff:** | 200 |
| **in detail:** | 30 physicians  
69 nurses  
   - at wards: 50  
   - at ENT-operation area: 12  
   - at ENT outpatients´ clinic: 7  
9 educational professionals and speech therapists  
27 technical staff  
   - engineers and hearing-aid audiologists: 17  
   - medical lab technologists: 10  
38 research staff |
| **Cochlear Implants 2015:** | 410 |
| **Middel ear implants 2015:** | 52 |
patients load management

Preliminary investigation
Audiometry (tone and speech)
ERA = ABR, SN10, CAP, ASSR, ECochG, OAE, CT & MRI (*)
Additional handicaps (*)
not-otogene speech-development disorders, Syndromale illness (Genetics), Autismus
Additionaly: pedagogic-therapeutic counselling about communication skills, expectations and therapeutic intervention after operation, technical support and counselling

First fitting
Direct fitting: 2-3 days after implantation
First Fitting: 4-6 weeks after implantation

Rehabilitation
Starts with preliminary therapeutic investigation and 4-6 weeks after implantation

After care
Starts after first fitting week
patients load management - adults

First fitting

4-6 weeks after implantation
3 to 5 fitting sessions,
4 single therapy lessons, 2 group therapy lessons,
1 visit to a museum with FM-system
2 visits with ENT-doctor
1 audiometry
1 vestibular diagnostic

Further interventions are possible

At home with family
With a speech therapist in the home town
In special rehabilitation clinics (about 3 weeks) – depend on the insurance of the pat.
patients load management - adults

After care: (regular intervals)
Starts after first fitting week
3 month
6 month
12 month
Once a year

Remote Care
After care with a hearing-aid acusticians near home town (17 center work with DHZ)

After care schedule:
• In patients with residual hearing: audiometry
• Fitting/ tune up
• Speech comprehension tests (numbers, monosyllables, sentences in quiet and noise)
• Visit ENT-doctor
patients load management - children

First fitting and Rehabilitation

• 4-6 weeks after implantation
• 3 to 5 fitting sessions (depend on unilateral or bilateral implantation)
• Fitting: Technical professional together with therapeutic professional
• Parent counselling as often as necessary
• First therapeutic intervention to guide the parents how to work with the child at home
• 2 visits with ENT-doctor
• 1 audiometry

At home:
speech and hearing therapy and additional therapy, if necessary, 1-2 x/ weeks,
Information exchange between therapist, kindergarten, school at home town and DHZ

DHZ visits (regular intervals):
• Every 8 weeks till first half a year
• Every 3 month till first 2 years
• Every half a year till 18 years of age
• Once a year
Non use of CI

Survey in patients with pediatric cochlear implant, 174 answered

2% are nonuser
Reasons of non use

• The child did not want a CI
  – Older brother got the CI simultaneously with younger brother

• The timing of the implantation was too late
  – poor performer
    Wrong suggestions about listening with CI – often in sequ. bilateral patients

• Social pressure (class situation)
  – SSD

• Psychological problems
  – depression, mobbing

• Additional handicaps
  – Autism spectrum disorder
my vision of CI teams in the next century

• Not to lose the aim: All patients are individual cases!
• Use of individual length of electrodes, depending on the cochlear length and size
• Easely handling of the speech processor
• Use of safe objective measures in fitting session (remote)
• Fitting (within a certain frame) is possible via Smartphone
  • Important for elderly patients or parents – relatives or nurse can fit the speech processor
• hearing- and speechtherapy is possible in every village
• CI-Center are necessary for whole interdisciplinary network
View to some outcome data: 1206 adults

- 91.7% of the patients would choose implantation again
- The expectations of 64.7% of the patients are fulfilled or better than that
- 66.5% can use telefon
- 54.1% like listening music
- Only 26.2% of the patients use accessories, partly or often (FM, audio cable, induction)
- More than half of the patients do never (or very seldom) change the loudness or the microphone sensitivity
- The subjective evaluation of the patients outcome is similar to the objective measurement.
View to some outcome data: adults

1169 from 1206 patienten were classified in 2010

Classification in performance classes:

- **bad**: $f(\text{sentence quiet}) < 60$
- **middle**: $60 \leq f(\text{sentence quiet}) \leq 140$
- **good**: $f(\text{sentence quiet}) > 140$

$$f(\text{sentence quiet}) = \text{sentence quiet} + 2 \times \text{sentence noise}$$
outcome influence factors in children: all significant

- Native speaker
- additional handicap
- Implantation < 3 years
- Mainstream institution
- Use of spoken language
- Understanding of spoken language
- Reading skills
- Writing skills
International Standard Classification of Education

Type of school (ISCED-97-level)
International Standard Classification of Occupation

ISCO-88 skill-levels

Mean skill level
CI-user: 2.24
normal hearing peers: 2.54
p=0.003
## ISCO-88 skill-levels

<table>
<thead>
<tr>
<th>ISCO-88 major group</th>
<th>ISCO-88 skill-level</th>
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<tbody>
<tr>
<td>1 Legislators, senior officials and managers</td>
<td>-</td>
</tr>
<tr>
<td>2 Professionals</td>
<td>4</td>
</tr>
<tr>
<td>3 Technicians and associate professionals</td>
<td>3</td>
</tr>
<tr>
<td>4 Clerks</td>
<td>2</td>
</tr>
<tr>
<td>5 Service workers and shop and market sales workers</td>
<td>2</td>
</tr>
<tr>
<td>6 Skill agricultural and fishery workers</td>
<td>2</td>
</tr>
<tr>
<td>7 Craft and related workers</td>
<td>2</td>
</tr>
<tr>
<td>8 Plant and machine operators and assemblers</td>
<td>2</td>
</tr>
<tr>
<td>9 Elementary occupations</td>
<td>1</td>
</tr>
<tr>
<td>0 Armed forces</td>
<td>-</td>
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Thank you for your attention!

ENT Clinic
Chair: T. Lenarz, PhD, M.D.
ENT Physicians
Biologists, Engineers, Pedagogics
Diagnostics

Surgical Therapy
Conservative therapy Th.
Sleep laboratory
Rhinology a. Allergology

DHZ
Science
Oncoclogy / surgery

Plastic Surgery