How to be confident that your patient will benefit from a Cochlear Implant
The Cochlear Implant
Ensuring excellent CI outcomes

- Candidature - selecting the right patients
- Managing expectations – counselling
- Surgical considerations
Main indication for CI

Clarity, not loudness, of speech
Candidature

- Acquired hearing loss

- Congenital hearing loss
Basic Questions

- Is patient becoming socially isolated?
- Can they use the telephone, understand TV?
- Do they have a properly fitting hearing aid?
- *When* did hearing aids stop helping?
Hearing Level to consider CI?

AUDIOGRAM - PURE TONE AVERAGE

SRT

Average CI Outcomes

% correct

4FPTA (dB HL)

Sentences in quiet-80%

Sentences in noise-57%
Limitations of Audiometry

- Severe hearing loss could be candidate

- *Speech perception can vary markedly* for same hearing: audiogram is “ball-park” only

- AIDED-Audiogram more important

- Speech perception is Gold Standard
Post-lingual adults: monosyllabic words
CI in Children
E. Phillips FOX  *(Mother and child)*
E. Phillips FOX  *The lesson*
Assessment

- Objective measures needed (ASSR, ABR)

- Audiometric measures important (90 dB PTA – a clear candidate)

- Hearing aid trial important- monitor speech and language. Implant if poor progress.

*Implant as early as possible*
Is the cochlear nerve present?
Evidence for a present NVIII

- **MRI:** T2 weighted images, parasagittal images
- CT-scan: patent cochlear aperture
- Audiogram: hearing thresholds (unaided, aided)
- eABR: (electric) auditory brainstem responses

(Slide...
Thanks to Emmanuel Mylanus)

Glastonbury et al. AJNR 2002
Case

- Adult, progressive deafness
- Severe loss
- CUNY sentence score in quiet 20%
Expected outcomes

• Would you implant?

• Speech perception – should it improve?

• Clarity of speech expression (speaking)?

• Awareness of environmental sounds?
Case

- 18 month old child
- Diagnosed at 6 months, bilat. profound loss
- Worn hearing aids from 6 months
- No speech expression
Expected outcomes

- Would you implant?
- Speech perception – should it improve?
- Clarity of speech expression (speaking)?
- Awareness of environmental sounds?
Case

- 10 year old child
- Diagnosed at 2 years with bilat. profound loss
- Worn hearing aids since 2 years
- No speech expression, uses sign language
Expected outcomes

• Speech perception – should it improve?

• Clarity of speech expression (speaking)?

• Awareness of environmental sounds?

• Implant?
Case

- 4 year old
- Progressive loss, now severe-profound
- Diagnosed at 12 months, aided bilaterally
- Language is behind, not progressing
- Speech intelligible but unclear
Expected outcomes

- Speech perception – should it improve?
- Clarity of speech expression (speaking)?
- Awareness of environmental sounds?
- Implant?
Case

- 5 year old child
- Diagnosed at 2 years, profound loss
- Aided at 2 years
- No speech, poor speech recognition
- Language development 3 years behind age
- Normal cochleae on CT/ MRI
Expected outcomes

- Speech perception – should it improve?
- Clarity of speech expression (speaking)?
- Awareness of environmental sounds?
- Would you implant?
Children- special cases

- Middle ear disease
- Multiple disabilities
- Auditory neuropathy
Adults – special cases

- Older patients
- Long standing dead ear
Congenitally-deaf adults

- Expectations are GREATLY reduced

- Key questions:
  Do they want to talk/ speak?
  Do they want to hear environmental sounds only?
Where to place a CI:
Proper electrode placement
Correct implant placement?

NO! – IT IS IN SCALA VESTIBULI
Is this in the right place?
Preparation for CI insertion

- Widely open the facial recess
  - Remove overhanging bone from facial nerve and chorda tympani
- **Identify and expose the round window**
- Understand the anatomy of the basilar membrane and osseous spiral lamina near round window
Round window insertion

- **Benefits**
  - Reliable landmark
  - No bone drilling, bone dust, risk of CSF leak

- **Risks**
  - Implant trajectory “less ideal”
  - Basilar membrane, modiolar injury
  - **Needs to be an appropriate electrode**
  - No difference in hearing preservation
Meningitis

Ossification can happen within weeks
Urgent MRI Justified
Any questions?