

# Hearing loss, Performance with CIs and Music

Mary Grasmeder

13 September 2013

## CI Candidates (adults)

- NICE (National Institute for Health and Care Excellence) have guidelines for who can receive funding for a cochlear implant:
- The hearing loss should be greater than 90 dBHL in both ears for high frequency sounds (2 and 4 kHz)
- Speech perception should be less than 50% correct on a sentence test when using hearing aids (tested in a quiet soundproof booth on a standard test)

## What does this mean in relation to music?

Hypothetical patient 'Jane' had normal hearing 10 years ago



Drop in her hearing – notices reduction in sound quality of music



hearing aids and time

Adjustment to the new sound → improved enjoyment



time

Profound loss of hearing and corresponding loss of audibility/sound quality of music



Avoidance of music



## What next?

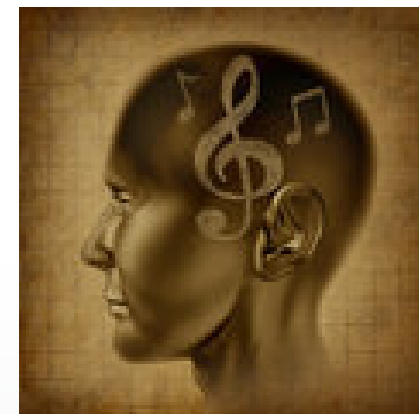
- Jane receives a cochlear implant
- All sounds are very strange to begin with
- She can hear that people are talking but their voices sound strange and it's difficult to understand them
- She notices environmental sounds – the ticking of the indicator in the car, the beeping of washing machine/microwave, doors banging...
- Gradually things become clearer the more she listens and also as the implant is tuned
- She begins to understand speech with her implant
- Music still sounds very strange



## Will 'Jane' get used to music with her CI?

That depends on:

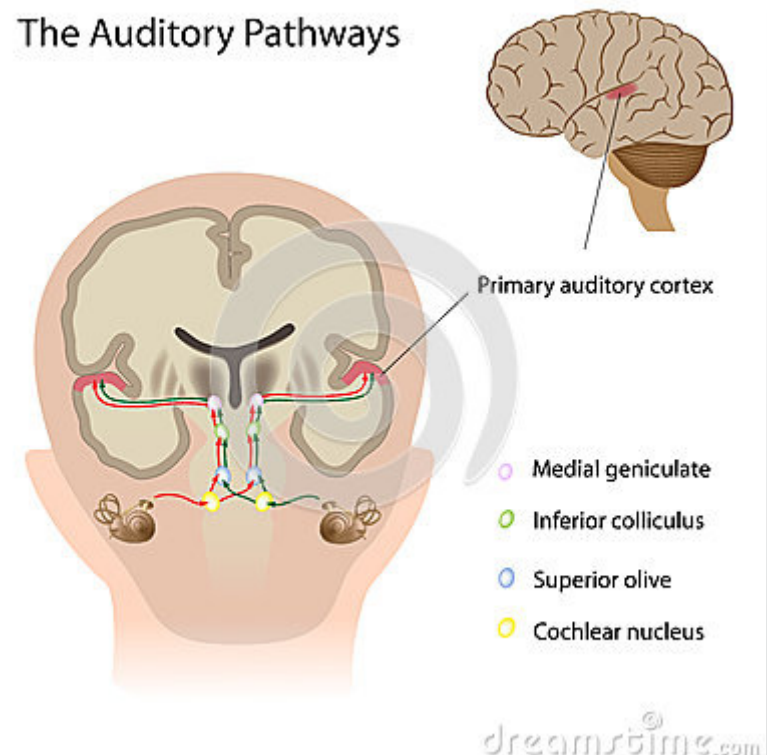
- How good/bad the sound quality is when she hears it
- How tolerant she is of imperfections in the sound quality
- How motivated she is
- If she believes that she will be able to do it
- How often she listens to it (practise makes perfect!) and concentrates on it
- If she has good strategies (watching DVDs, simple music to start with, direct input, good listening environments...)
- If she receives good advice/tools which will help her



# Sound quality and performance

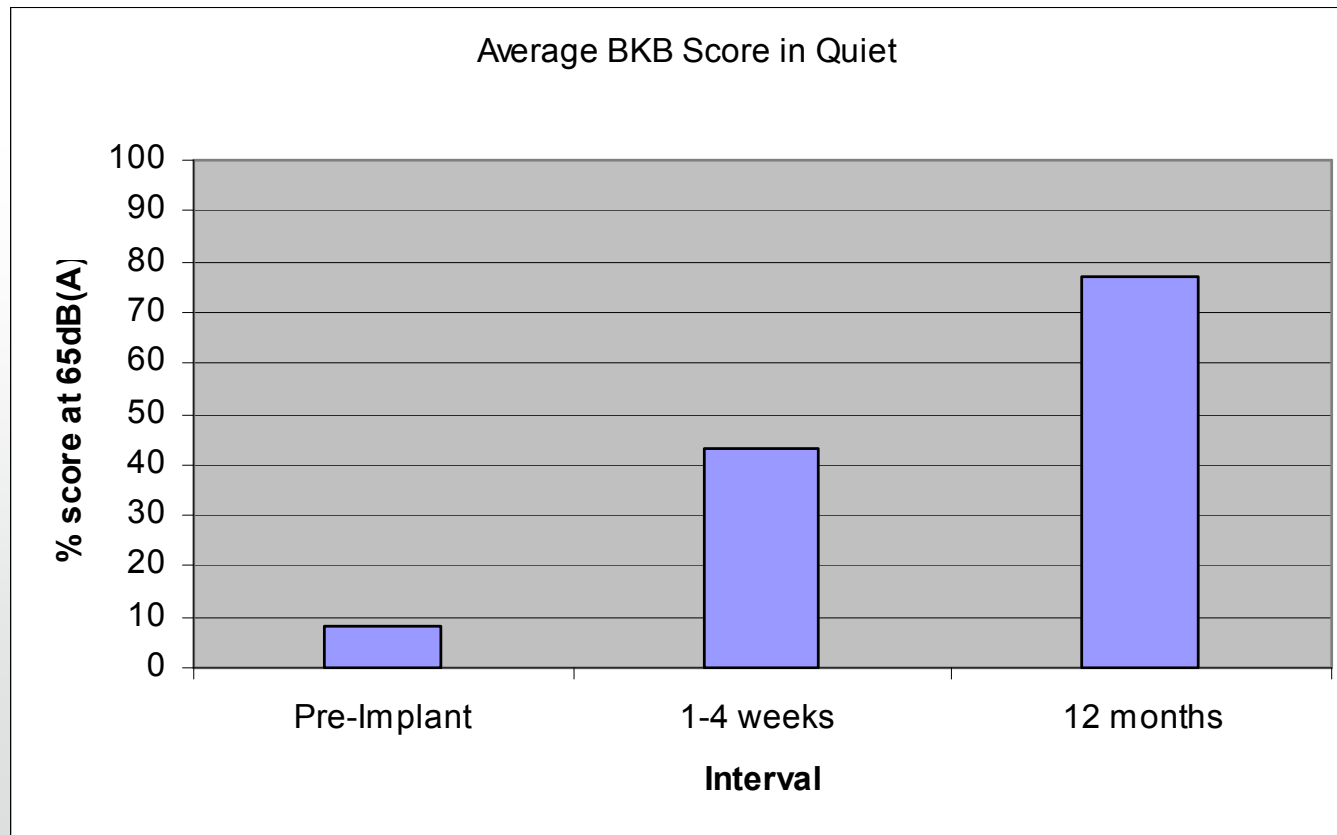
- Sound quality of music depends on the individual's ability to perceive sounds with their implant
- Performance with CIs varies enormously between individuals
- Depends on the condition of the auditory system at the time of implantation
- This includes the brain
- Some patients with long durations of deafness and/or deafness in childhood will find things much more difficult than 'Jane'

The Auditory Pathways



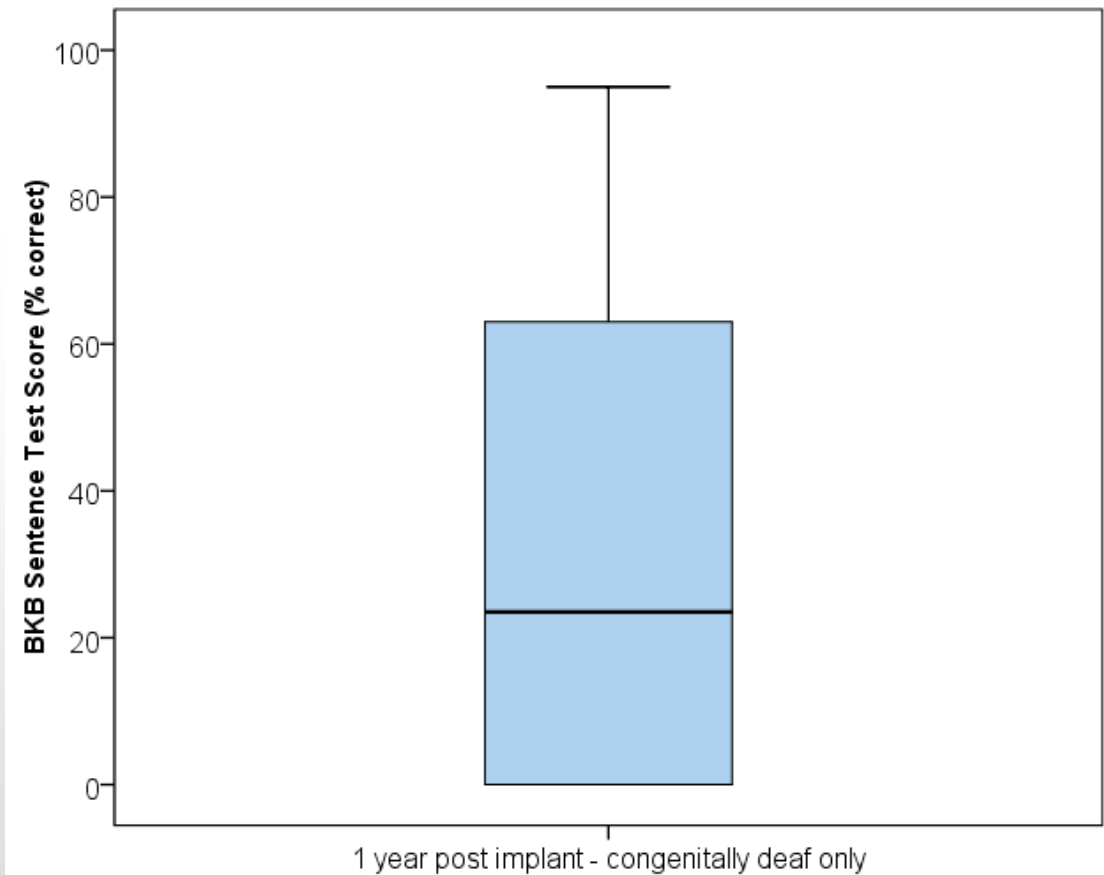
# Average Speech Perception Scores without Lip-reading for Adults

(from 2009 progress report)



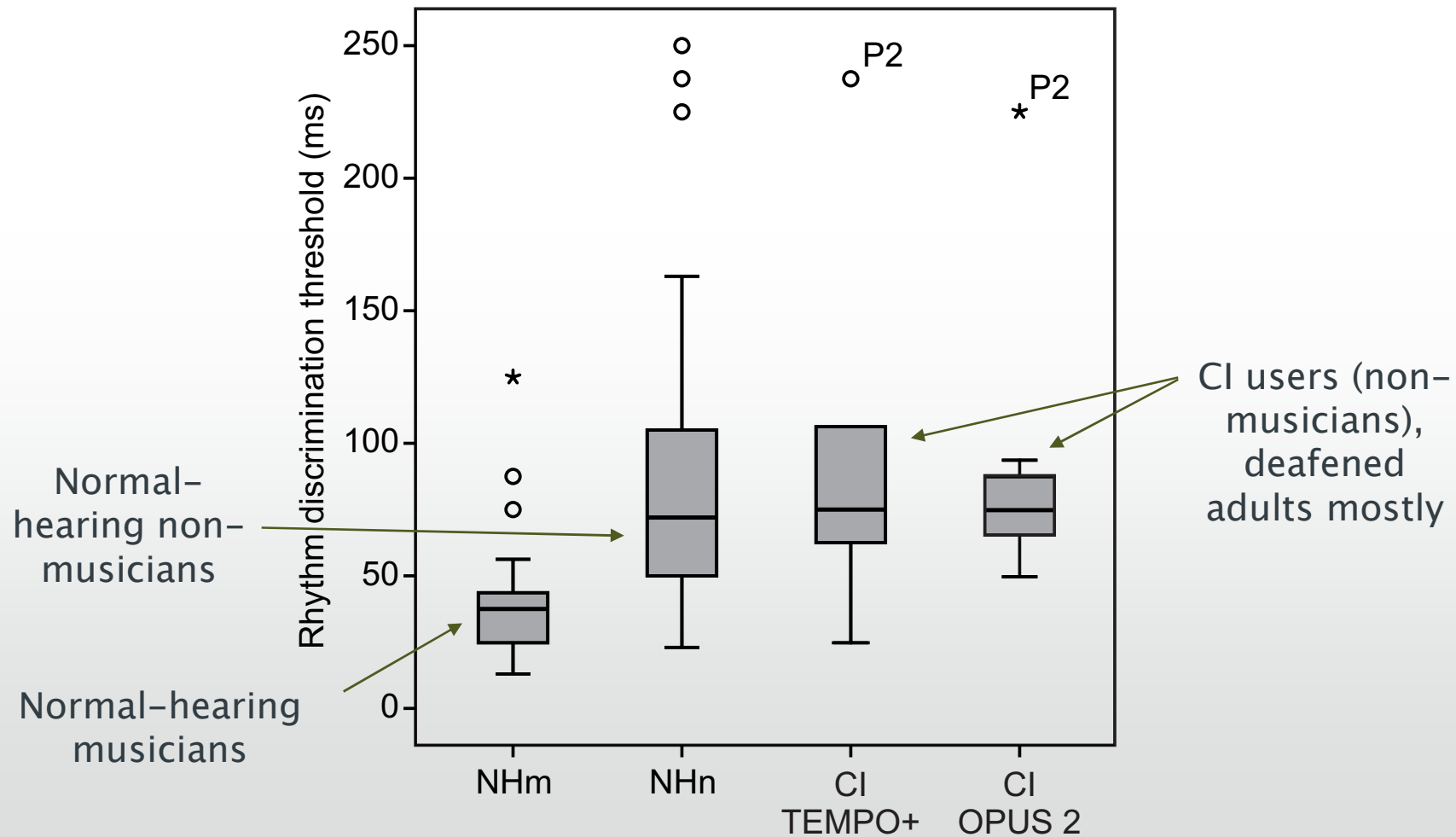
## Range of Performance at 12 months post-CI

- By 1 year post-implant, acclimatisation has occurred
- Majority of deafened adults will hear speech well in quiet even without lip-reading
- Performance much more varied in congenitally deaf adults/those deafened in childhood



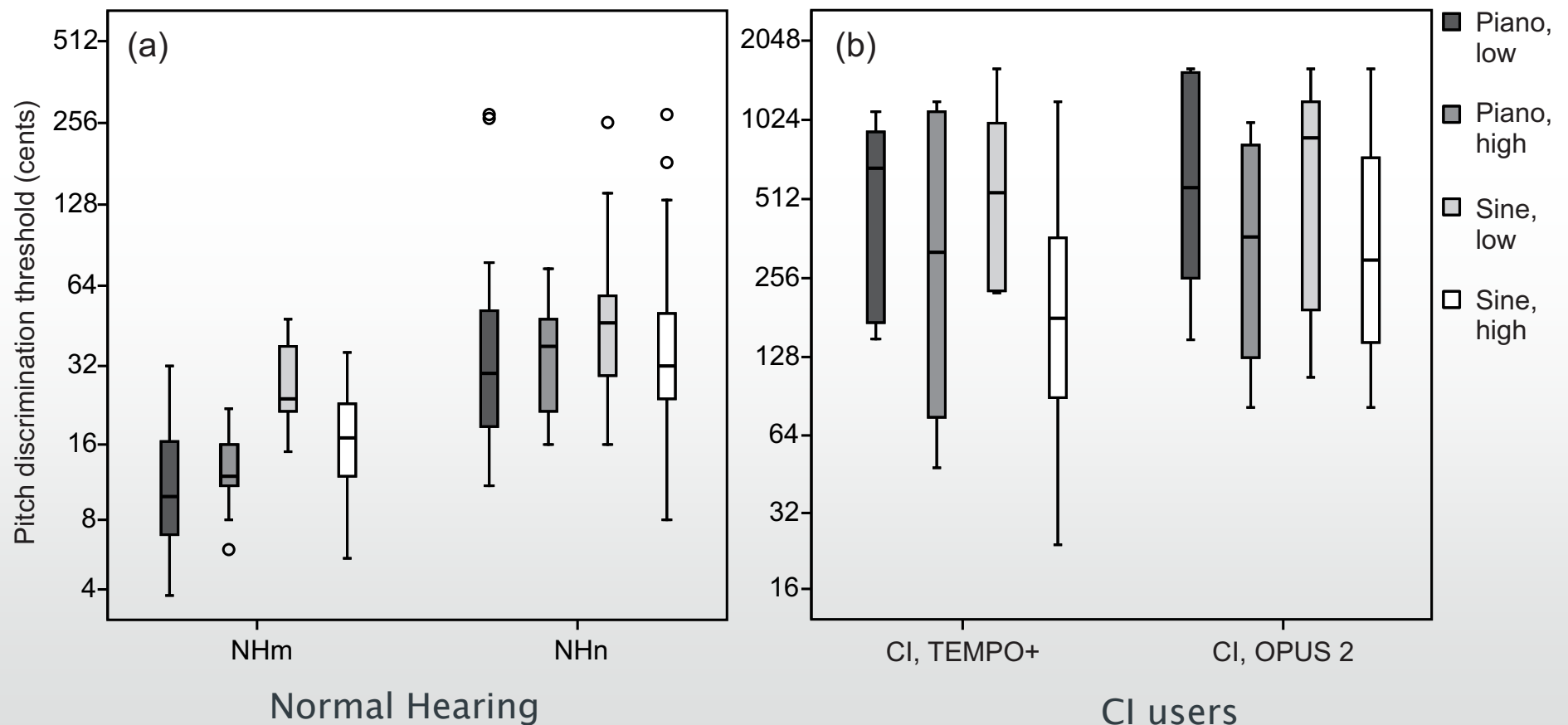


## Musical Performance Tests – Rhythm



# Musical Performance Tests - Pitch

100 cents = 1 semitone



## Conclusion

- ‘Jane’ may get used to listening to music again
- It won’t be easy
- You may be able to help!