

## Ear Science Education: Hearing Implants Series 21/22



## Workshop 2: Guiding your clients through the journey: From saying 'yes', to rehabilitation and bimodal management

- In this workshop, we will discuss a pragmatic approach to the underlying factors impacting decision making when considering cochlear implants and the importance of shared care in optimising outcomes for bimodal clients.
- This is an interactive workshop, participants will be involved in case discussions and be mentored by experienced implant audiologist facilitators.



## Ear Science Education: Hearing Implants

### The Hearing Implant Series 2021/2022 includes:

- 2 **workshops** designed to support clinicians in maintaining clinical excellence and optimised hearing care for all clients.
- “Translating the Science” **research updates** available **online**, offering you the flexibility to complete this in your own time around work and other commitments.



## Program



- 6:30pm | Welcome and Introduction
- 6:35pm | Factors influencing decision making for cochlear implant candidates and the importance of shared care for bimodal clients (Presentation)
- 7:10pm | Bimodal Management, your questions answered (Panel discussion with audience involvement)
- 7:30pm | Case Studies (Facilitated group discussion)
- 8:00pm | Finish



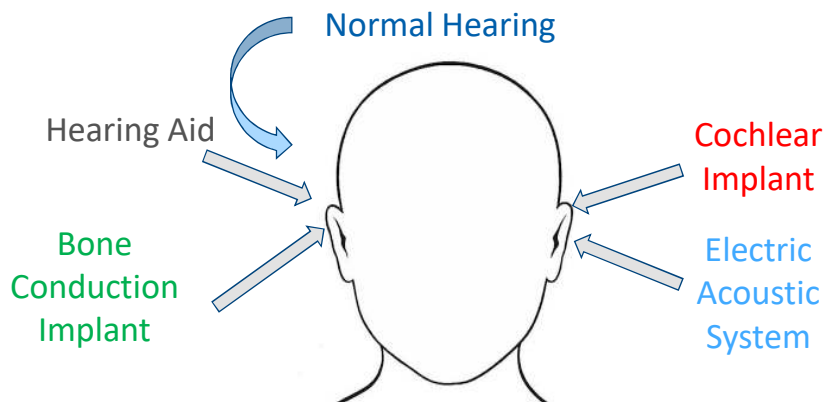
# Bimodal Management

## The importance of shared care

- Dr Cathy Sucher
- Ms Steffanie Cohen



# What is bimodal hearing?



# Why are we seeing more bimodally fitted clients?



## Better hearing outcomes

- Improved uptake of CI in general



## CI candidacy criteria and funding changes

- Improved awareness of changes for people with greater levels of hearing in one or both ears



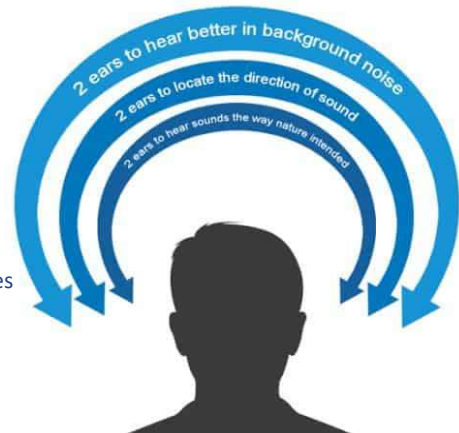
## Benefits of binaural hearing

- Greater awareness and acknowledgement of benefits



# Binaural Advantages

- Improved speech perception (Quiet & Noise)
  - Binaural redundancy/summation effects
  - Spatial separation (binaural squelch & head shadow)
- Improved sound localization
- Improved ease of listening
- Potential relief from tinnitus
- Improved Quality of Life
- Prevention of auditory deprivation in the unaided ear
  - Particularly important when considering implantable hearing devices for the future
  - Cortical reorganisation!!

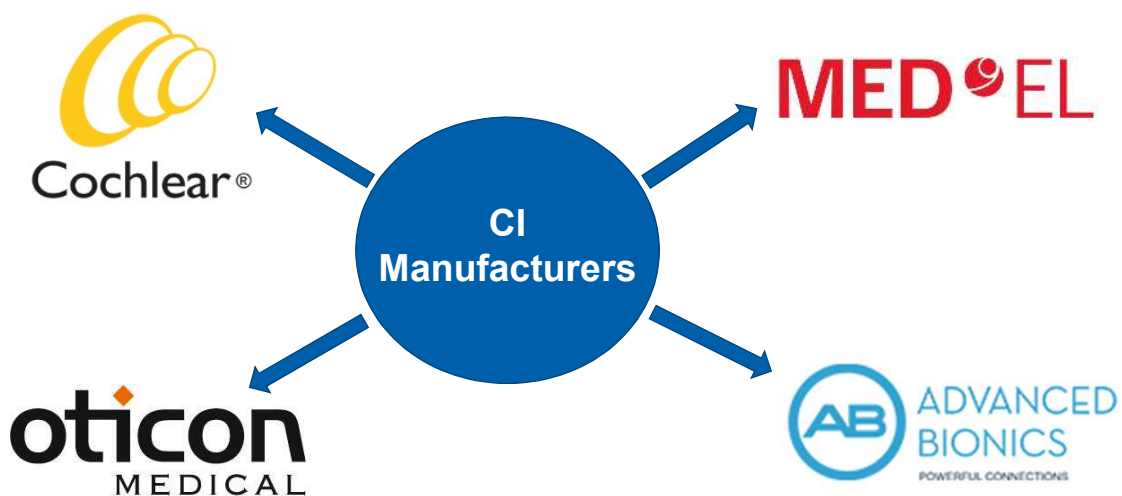


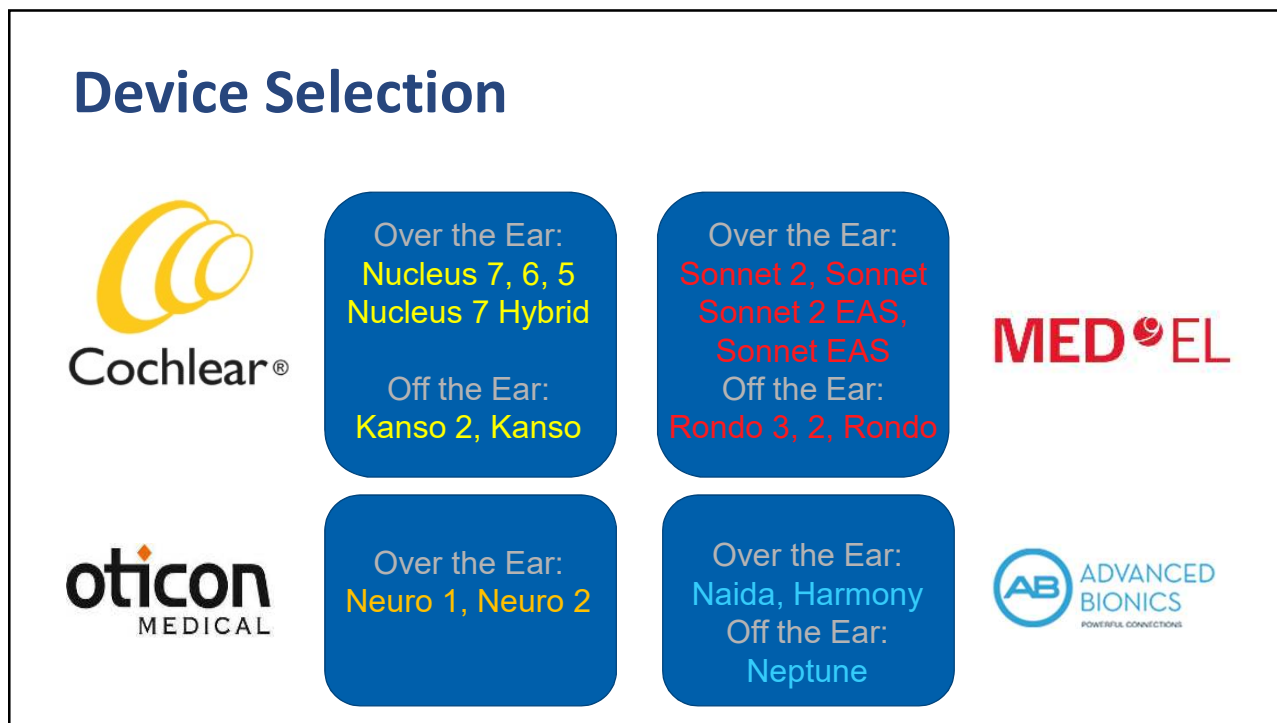
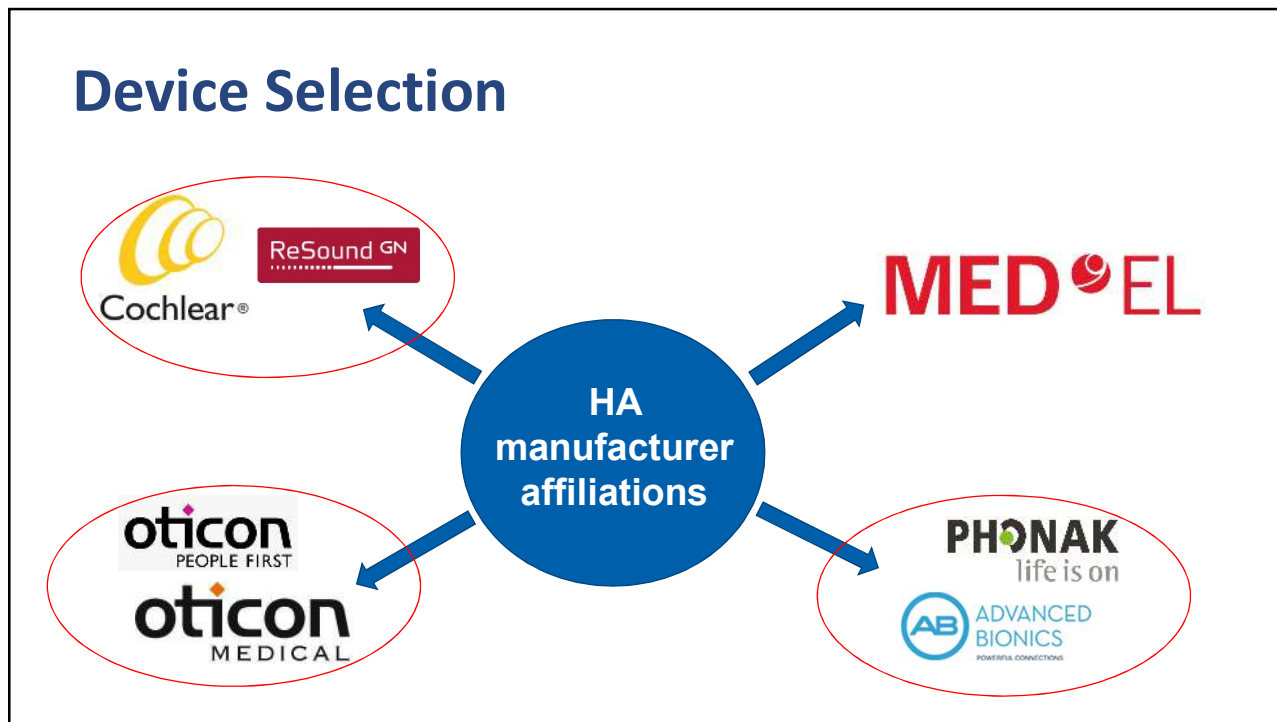
## Considerations for our bimodally fitted clients

- Cochlear Implant model options
- Hearing Aid prescription
- How to fit bimodally
- Device use (apps and accessories)
- Funding
- Joint client management



## Device Selection





## Device Selection



Nucleus 7

Nucleus 7 Hybrid



Nucleus Kanso 2



Neuro 2

Over the Ear:  
Nucleus 7, 6, 5  
Nucleus 7 Hybrid

Off the Ear:  
Kanso 2, Kanso

Over the Ear:  
Neuro 1, Neuro 2

Over the Ear:  
Sonnet 2, Sonnet  
Sonnet 2 EAS,  
Sonnet EAS

Off the Ear:  
Rondo 3, 2, Rondo



Sonnet 2

Sonnet 2 EAS



Rondo 3



Naida Q90

Neptune

Over the Ear:  
Naida Q90, Harmony

Off the Ear:  
Neptune

## Device Selection: Direct Streaming



Over the Ear:  
Nucleus 7  
Nucleus 7 Hybrid

Off the Ear:  
Kanso 2

Over the Ear:  
Sonnet 2  
Sonnet 2 EAS,



## Streaming (no additional streamer): Cochlear



### Cochlear Ltd N7 or Kanso2 processors

- **Compatible Hearing Aids**

- ReSound ONE
- ReSound Key
- ReSound Linx Quattro,
- ReSound Linx 3D
- ReSound ENZO Q
- Resound ENZO 3D

- **Compatible Phones**

- iOS 12 or later (iPhone 5s onwards, iPad 4<sup>th</sup> gen onwards)
  - Use Listen Live feature on the phone as a remote mic
- Android 10 (if phone uses an ASHA protocol), (Samsung Galaxy S21 onwards, Google Pixel 3 onwards)

**Check website for most up to date information:**

<https://www.cochlear.com/global/en/apps/sound-processor-and-app/compatibility>

NOTE: Hearing aid and cochlear implant have to be linked through Custom Sound software

## Streaming (additional streamer): Cochlear

- Non-compatible smart phones or N6/Kanso (older) processors
  - Phone clip to connect to Bluetooth devices
- For streaming not related to bluetooth
  - Mini Mic2+ or GN Multi Mic - Remote Microphone
  - TV Streamer – connect to TV/Computer



Mini Microphone 2 / 2+

TV Streamer

Phone Clip



## Streaming: Med El

Sonnet and Sonnet2 (and EAS versions) and Rondo3 sound processors:

- **Audiostream** (battery cover with square end incorporating Bluetooth receiver)
  - Only for Sonnet, Sonnet 2 (and EAS versions of sound processor)
  - iPhone 5 onwards, iPad 4<sup>th</sup> gen onwards
    - use Listen Live feature on iPhone as a remote mic
  - Android: Google Pixel 3 onwards, Samsung Galaxy Tab S7+ onwards, OnePlus 9 onwards, Xiaomi 11T Pro, Oppo Find X3 Pro (CPH2173)
  - <https://www.medel.com/en-au/hearing-solutions/accessories/connectivity/audiostream>
  - Need to activate Audio2Ear app to stream audio/music from phone



## Streaming: Med El

Sonnet and Sonnet2 (and EAS versions) and Rondo3 sound processors:

- **AudioLink**
  - Connects with any Bluetooth enabled phone
  - Need to activate Audio2Ear app to stream audio/music from phone
  - Use as a remote microphone
  - Connect to TV to use as a TV streamer



## Med El Wireless Bimodal Streaming with Samsung Dual Audio

Sonnet and Sonnet2 sound processors and Audiostream

- **Compatible hearing aids**

- GN ReSound Linx Quattro + ONE
- Beltone Amaze+ Imagine
- Starkey Livio + Livio AI
- Oticon More

- **Compatible Samsung Phones**

- Galaxy Z Flip
- Galaxy S20, S20+ & S20 Ultra
- Galaxy Note10/10+/ Note10+ 5G
- Tab S6
- Galaxy S10e, S10 & 10+
- Galaxy Note9
- Galaxy S9 & S9+
- Galaxy Tab S4

<https://www.samsung.com/au/support/mobile-devices/setting-up-dual-audio/>

## Bimodal Streaming: Oticon Medical

Neuro 2 Sound Processor

- **Oticon Medical Streamer XM** (streaming interface)
- Pairs to any Bluetooth enabled phone
  - (need to activate through implant software)
- Doesn't require implant software to link to HA
- **Compatible hearing aids**
  - Oticon Dynamo
  - Oticon Sensei SP
  - Oticon Xceed



# Streaming (accessories) Oticon Medical

## Neuro 2 Sound Processor

- **Oticon Medical Streamer XM** (streaming interface)
  - Pairs to any Bluetooth enabled phone
- **ConnectLine Microphone**
  - Remote microphone
- **TV Adapter 2.0**
  - TV streamer



# Bimodal Streaming: Advanced Bionics (accessories)

## NaidaQ90 Sound Processor

Phonak EasyCall Adaptor



Phonak DECT Phone



Phonak ComPilot



Roger System



Phonak TVLink II



Phonak RemoteMic



Phonak MyPilot Remote Control

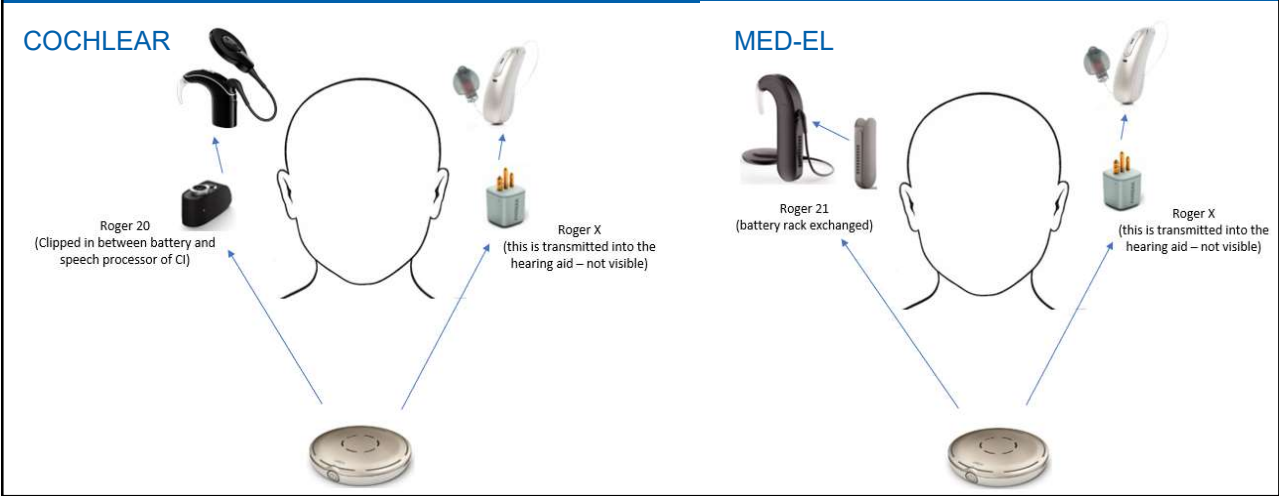
## Generic Bimodal Streaming: FM Systems

- If you do not have compatible phones or hearing aids, you could consider using a Roger (FM) System
- There are many different configurations available
- Review your options using the Roger Configurator:
  - <https://www.phonakpro.com/com/en/support/product-support/wireless-accessories/roger-configurator.html>
- These systems can only be activated through a telecoil
- Alternatively, a Bluetooth Neckloop (for telecoil) can be used



The screenshot shows the 'Roger Configurator' web interface. At the top, there's a title 'Roger Configurator' and a 'Start Over' button. Below the title is a progress bar with four steps: 'Hearing Instrument', 'Microphone', 'Receiver', and 'Configuration'. The 'Hearing Instrument' step is currently active. On the left, there's a diagram showing a hearing aid, a microphone, and a receiver connected by plus signs, followed by an equals sign and a document icon. Below this diagram, text states: 'Roger works with almost every hearing system on the market. This tool makes it easy to find the equipment you need for your client.' On the right, under the heading 'Choose a Hearing Instrument', there are three dropdown menus: 'Select a brand', 'Select a product family', and 'Select a model'. Each dropdown has a green checkmark icon. At the bottom of the right panel is a 'Get Started' button.

# Bimodal Streaming: Roger



# Bimodal Streaming

## Considerations:

- ✓ COSI Goals
- ✓ Dexterity
- ✓ Cognitive skills
- ✓ Assistance from others
- ✓ Second side?



## Device Fitting: Considerations

- Differences in sound quality
  - Electrical stimulation vs AC
    - Electrical stimulation – pitch changes over time
  - Addition of a HA to the non-implanted ear may actually improve sound quality for CI/EAS users, even with very limited access to a narrow frequency range
  - Results in improved perception of speech in noise, music and general sound quality
- Accessible frequency range
- Differences in processing

## Device Fitting: Adjusting the Frequency Response

### Paired Comparison/Frequency Response

- Consider adjusting the frequency response of the HA once a stable CI map has been achieved
- Method
  - Create HA fitting with Low/High frequency emphasis( $\pm 6\text{dB/oct}$  0.25-2kHz) of NAL target
  - With CI off, present speech via FF at client's MCL with different frequency responses in pairs
  - Determine which frequency response (HF/LF emphasis/NAL) provides best speech understanding
  - If a particular fitting is chosen 8/10 times, use this, if not revert to NAL frequency response

'Fitting and Evaluating a Hearing Aid for Recipients of a Unilateral Cochlear Implant: The NAL Approach', The Hearing Review (Online) (Los Angeles, 2004)

## Device Fitting: Adjusting Loudness Balance

### Loudness Balancing

- Best bimodal outcomes are achieved when loudness is balanced between devices/ears
- Balance HA to CI once a stable map/setting has been achieved
- Method
  - Present continuous speech in FF to CI only at 65dB SPL: Ensure comfortably loud, if not return to implant audiologist
  - Compare loudness of speech with CI to loudness with HA and adjust HA gain until HA and CI loudness is judged equal using a loudness balancing scale: Repeat 2-3 times until you achieve the same gain
  - Present speech at 80dB SPL. Adjust CR until the speech is reported as loud as implant. If CR isn't adjustable, adjust CT
  - Present speech at 65 DB SPL with both devices on
    - Speech should be rated comfortable

*'Fitting and Evaluating a Hearing Aid for Recipients of a Unilateral Cochlear Implant: The NAL Approach', The Hearing Review (Online) (Los Angeles, 2004)*

## Apps to control your processor

Cochlear Ltd: Nucleus Smart App, N7 and Kanso2 Sound Processors

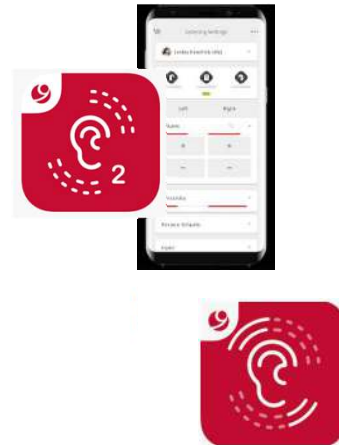
- **Adjust your device**
  - Programs, volume, sensitivity
- **Monitor the status of their sound processor**
  - battery life, trouble shooting
- **Adjust the mixing ratio**
  - streamed audio compared to audio from the sound processor
- **Find a lost processor**
- **Hearing Tracker**
  - Monitor if the coil is losing connection or how much time you are spending in speech
- **Activate device streaming**
  - e.g. tv streamer or mini mic
- Use with compatible smart phones, tablets and Apple watches
  - <https://www.cochlear.com/global/en/apps/sound-processor-and-app/compatibility>



## Apps to control your processor

MedEl: Audio Key 2 App and Sonnet 2, Sonnet 2 EAS,  
Rondo 3 Or Sonnet or Sonnet EAS via AudioLink

- **Adjust your device**
  - Programs, volume, sensitivity
- **Find a lost processor**
- **Monitor a loved one's sound processor**
  - 3<sup>rd</sup> party adjustment of device
  - Monitor device use
- **Datalogging**
  - Monitor your own device use
- **Audio2Ear**
  - Streaming music and audio



## Apps to control your processor

**Oticon Medical: ConnectLine App and Neuro 2  
(with Oticon Medical Streamer XM)**

- **Adjust your device**
  - Programs, volume, switch between sound sources, mute sounds around you





## Funding

- Maintenance/parts/upgrades – some considerations
  - Adult HSP eligible patients
    - CI recipients
      - Battery & Maintenance program through Hearing Australia = \$42 (Parts and maintenance through central CI support service)
      - Eligible for ALDs (criteria applies)
      - **Not** covered for upgrades

NOTE: clients can maintain HA through their preferred HA provider or get a parallel service agreement with Hearing Australia



## Funding

- Private Health Insurance
  - Upgrades Every 3-5 years
- NDIS
  - Permanent BILATERAL hearing loss >90dB in the better ear.
  - Hearing impairment are equal or greater than 65dB in the better ear which results in reduced functional capacity.
  - Hearing impairments <65dB in the better ear in conjunction with other permanent impairments (ie. cognitive, vision)
- Self-funding
- Paediatric patients
  - CI recipients eligible for implant parts, maintenance and upgrades through Hearing Australia
  - Parts and maintenance through central CI support service
  - Parts and maintenance through local HA

## Appointment Schedule: CI

MONTH	Details/Week	Appointment Content
Pre-Op		
Surgery		
Month 1	Week 1	Device Switch-on. This occurs 1 to 3 weeks after surgery. <b>Report</b>
	Week 2	Mapping + Rehab
Month 2	Week 5	Mapping + Rehab
Month 3	Week 9	Mapping + Rehab
	Week 12	3 Month Review (Audiogram, speech testing, device & maintenance)
Month 6	Week 24	Mapping + Rehab
	Week 26	6 Month Review (Audiogram, speech testing, <b>Report</b> )
Month 12	Week 56	Mapping + Rehab
		12 Month Review (Audiogram, speech testing, <b>Report</b> )

## Considerations for Second Side

- Loss of residual hearing on 2<sup>nd</sup> side
  - Changes in sound quality
    - Speech and music
  - Loss of ability to hear anything when removes CIs (safety concern)
- Vestibular issues
  - 2<sup>nd</sup> CI may result in bilateral vestibular hypofunction
  - Balance assessment to mitigate this risk
- Additional surgery cost and inconvenience
- Additional costs of maintenance, etc.
- Potential benefits when able to access for frequency range on both sides
  - Improved awareness of sound
  - Safety
    - ? improved directionality/localization
    - Reduced need to have people sit on the "good" side
    - Improved hearing in quiet and noise

# Questions?



## Panel: Bimodal Management, Your Questions Answered

Panel discussion with experts and a bimodal client,  
facilitated by Ms Ronel Chester-Browne

- Dr Cathy Sucher
- Ms Steffanie Cohen
- Ms Varsha Mathew
- Mr Keith Sullivan



# Case Studies

## Bimodal Management

- Facilitated by Ms Ronel Chester-Browne



# CASE STUDY Example: ALICE



LEFT = Cochlear N7

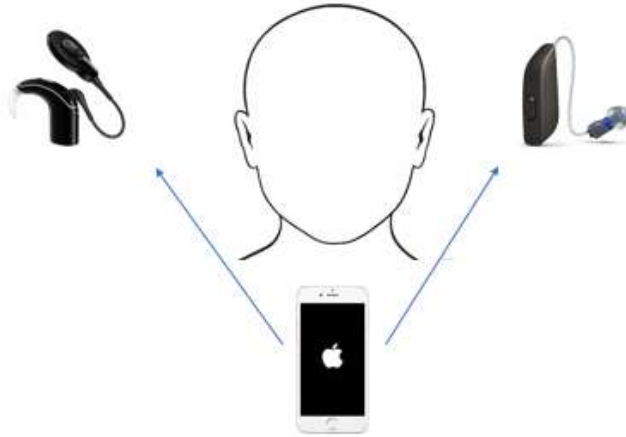
RIGHT = GN RESOUND LINX 3D

### COSI GOALS:

- Improved hearing on the phone as she wishes to stream bimodally (iPhone 12).

## Case Study Example: Alice

### BIMODAL STREAMING OPTIONS (IPHONE) N7 Speech Processor and GN Resound Hearing Aid

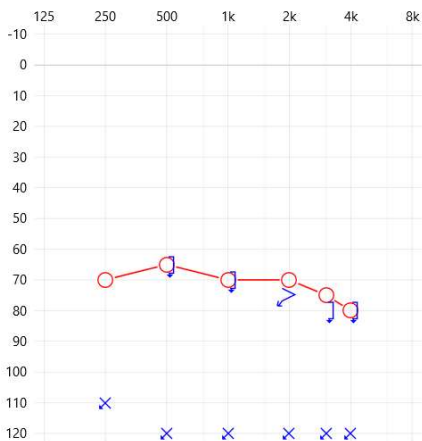


## Breakout Group Case Study Discussions

- In your breakout groups, work together through your case study
- One person should document your team's findings and answer to the question(s)
- We will then rejoin to discuss your findings
- You will have 10 minutes to review your case



# CASE STUDY 1: PETER

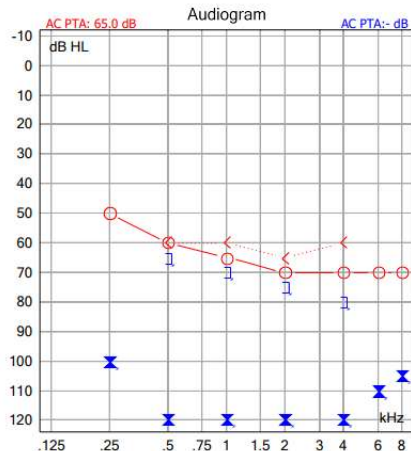


LEFT = Cochlear N7  
 RIGHT = Phonak Audeo V70  
 ALDs: Compilot and a Roger select

**COSI GOALS:**

- To be able to stream his phone calls and podcasts bimodally (Samsung S20).
- To be able to stream media from his iPad bimodally
- To be able to hear work meetings through teams when using his laptop
- To be able to hear the dialogue on the television
- Improved speech understanding with conversation in BGN when in small groups

# CASE STUDY 2: SUSAN



LEFT = MED-EL Sonnet 2  
 RIGHT = Unitron DX Stride PR (direct streaming compatible)

**COSI GOAL:**

- To be able to hear over the iPhone 11 (daily)

**Considerations**

- Limited funding
- Memory and technology concerns

CUNY – Sentences in Quiet

Listening Condition	Recorded	Post-Op 5 yearly
R+L	65dB SPL	15/5/22
R		87%
L		18%
		98%



## Questions:

- **Case 1: Peter**
  - Discuss what brand of hearing aid you would recommend, as well as any possible ALDs to meet Peter's needs. Consider cost and ease of use.
  - HINT: There are several different options that Peter could use.
- **Case 2: Susan**
  - What is the best option to present to Susan to help her hear over the phone?

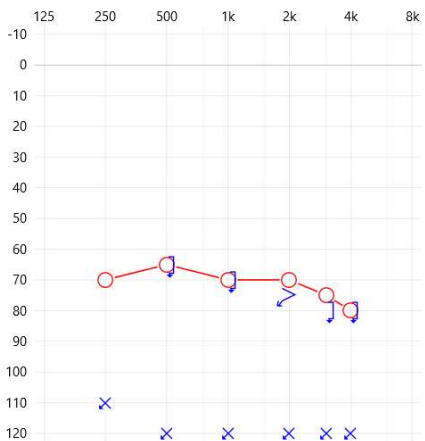


## CASE STUDIES

- Findings & Discussion



# CASE STUDY 1: PETER



LEFT = Cochlear N7  
 RIGHT = Phonak Audeo V70  
 ALDs: Compilot and a Roger select

**COSI GOALS:**

- To be able to stream his phone calls and podcasts bimodally (Samsung S20).
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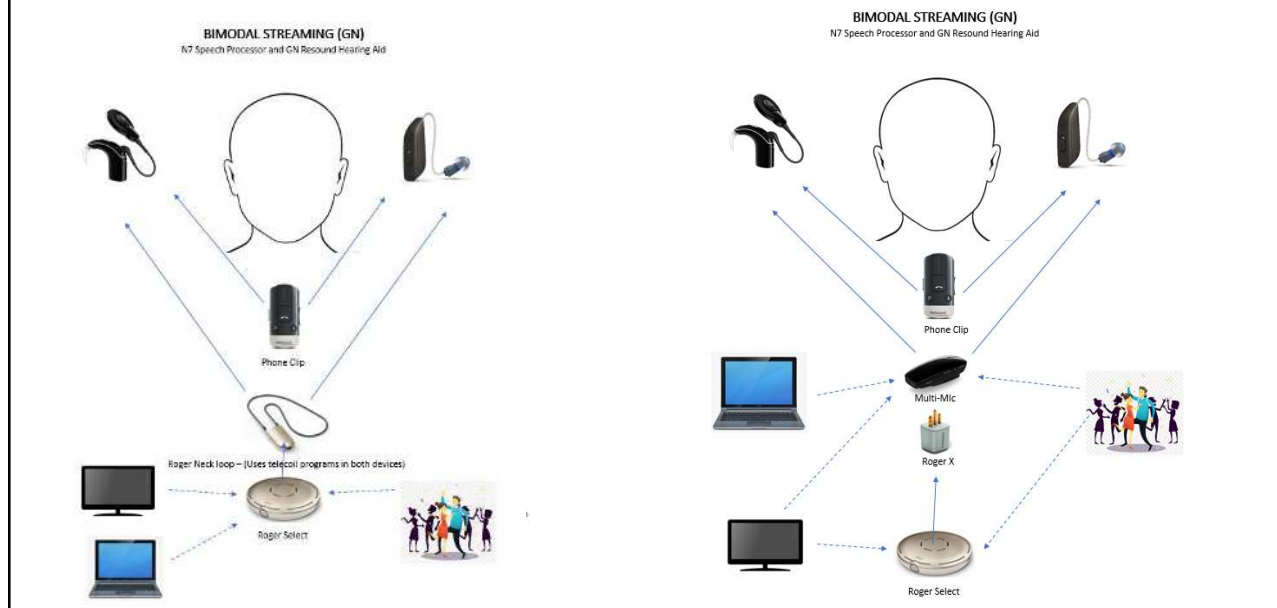
## Case Study 1: Peter

**BIMODAL STREAMING OPTIONS (ANDROID PHONE)**  
 N7 Speech Processor and GN Resound Hearing Aid

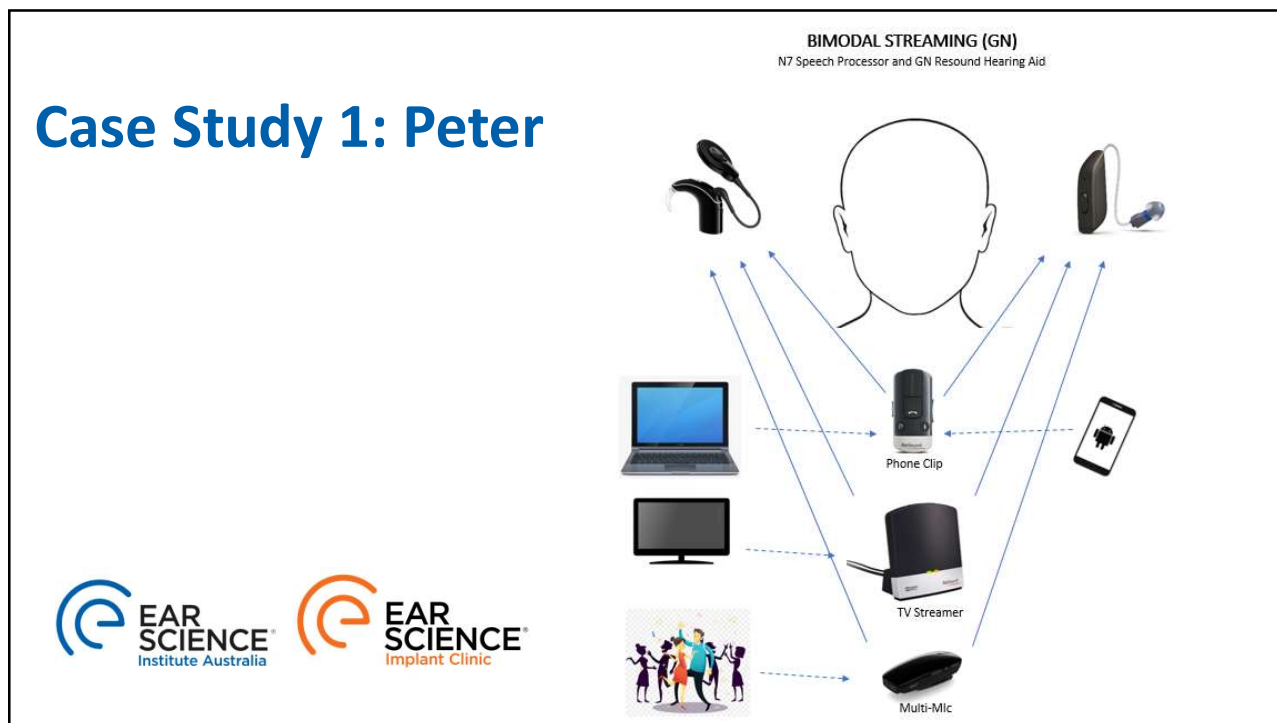




# Case Study 1: Peter



# Case Study 1: Peter



## Case Study 1: Peter

**BIMODAL STREAMING**  
N7 Speech Processor and Phonak Paradise Aid

**NOTE: NO OPTION FOR BIMODAL PHONE STREAMING**

# CASE STUDY 2: SUSAN

Audiogram

AC PTA: 65.0 dB

AC PTA: - dB

LEFT = MED-EL Sonnet 2  
RIGHT = Unitron DX Stride PR (direct streaming compatible)

**COSI GOAL:**

- To be able to hear over the iPhone 11 (daily)

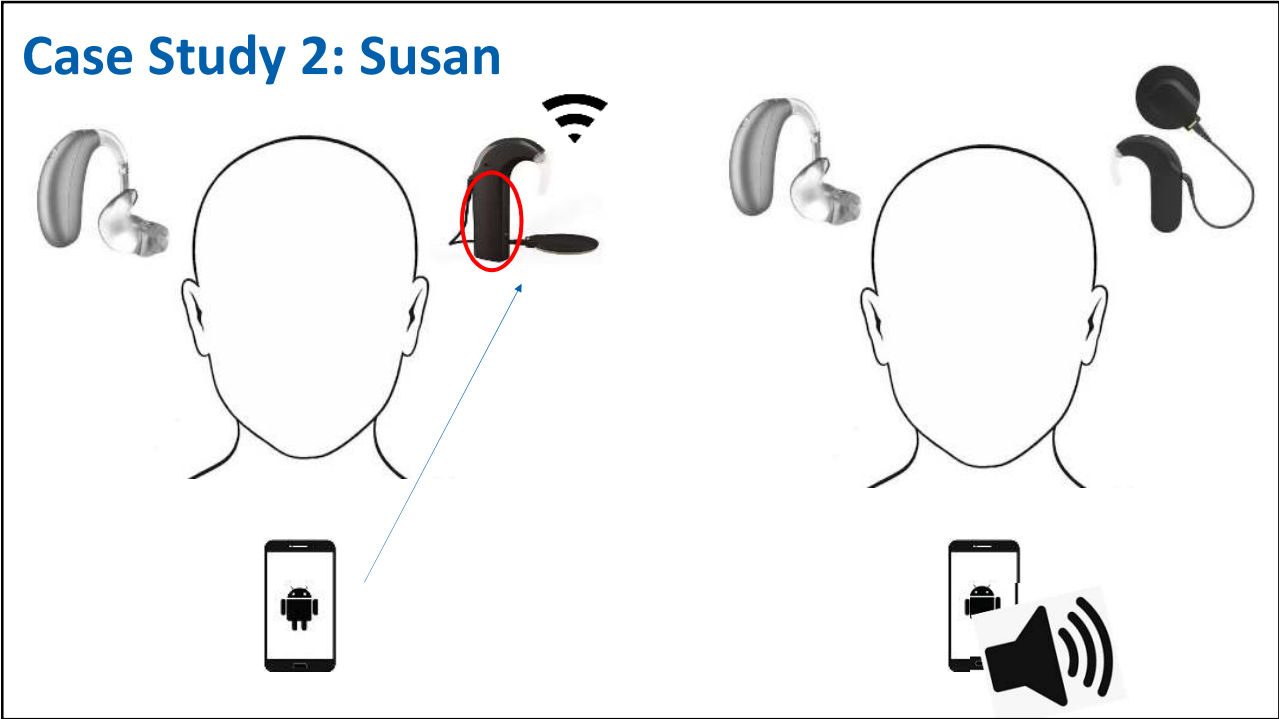
**Considerations**

- Limited funding
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CUNY – Sentences in Quiet

Listening Condition	Recorded 65dB SPL	Post-Op 5 yearly 15/5/22
R=L		87%
R		18%
L		98%





Thank you



## Translating the Science

- Translating the Science research updates you can access online, on-demand.
- Provide an update on research from some of WA's most influential researchers about the journal articles they have published
- Opportunity to ask the researchers questions
- Will give you the confidence to apply these learnings to your clinical practice
- Eligible for AudA 1 non-endorsed point per update, and ACAud CEP approved



## Workshops

### Audiology Australia

- **Workshop 1 and Workshop 2:** CPD2122 027
  - Category 1.1 | 2 CPD points
  - Category 2.2 | 1 CPD point
- Attendance at **both** workshops accrues 3 endorsed CPD points.
- Attendance at **only 1** workshop will allow you to log the event for 1.5 non-endorsed points.

### AcAud

- Workshop 1: 202154 - 3 CEP points
- Workshop 2: 202155 - 3 CEP points



## What to do next...

- For those who have attended both workshops, Ear Science will submit the accreditation paperwork for AudA.
- **To be assigned your points you need to:**
  - Go to the website (link, also in the chat, also in emails) to access the portal
 

Password - EarScience
  - Complete
    - Evaluation form
    - Reflection Form
    - Multiple Choice Questionnaire, 9/12 correct, multiple attempts allowed



## Ear Science Implant Clinic Referral Pathway

### If your client may benefit from a hearing implant, referring is easy:

- Send an **email** including a referral form & audiogram | [hello@earsience.org.au](mailto:hello@earsience.org.au)
- **Online** referral form | [https://www.earsience.org.au/wp-content/uploads/ESIC-referral-form\\_2022.pdf](https://www.earsience.org.au/wp-content/uploads/ESIC-referral-form_2022.pdf)
- **Call** the Ear Science team and ask for Jody | 1800 054 667

**Your client will be supported each step of the way by our experienced Implant Audiologists and Jody our Hearing Implant Client Support Officer**



## Thank you

- Please let us know if you have any questions
- We appreciate you joining us this evening

