What’s new at Cochlear?

Adrienne Olsen
Clinical Specialist
Our mission is to help people hear and be heard, empowering them to connect with others and live a full life…

…we will help change the way people understand and treat hearing loss…

…and provide an innovative range of implantable hearing solutions, delivering a lifetime of hearing outcomes.
- Australian Graham Carrick becomes the world's first commercial cochlear implant recipient in 1982
- Graham hears again at age 37 after 17 years of profound deafness
Origins of Cochlear™

Medical pioneering research skills of Professor Graeme Clark AC

Medical entrepreneur skills of Paul Trainor AO

Commercialisation supported by Federal Government investment
Nucleus 22

1982
8 Generations Of Sound Processor

83 WSP 89 MSP 94 Spectra 97 SPrint™ 98 ESprit™ 02 ESprit 3G 05 Freedom™ 09 CP810
Cochlear Today

- More than 250,000 recipients worldwide, the largest implant community in the world
Australian Hearing Hub

- All aspects of hearing health co-located
- $40 million grant
- Groups such as Australian Hearing, Royal Institute of Deaf and Blind Children, The Shepherd Centre, Sydney Cochlear Implant Centre, Depts of Audiology, Speech and Language, Macquarie Uni, Private Hospital,
Cochlear product overview

<table>
<thead>
<tr>
<th>Cochlear Nucleus® CP810 with Nucleus CI24RE Implant Series</th>
<th>Cochlear Hybrid™ Implant System</th>
<th>Cochlear Baha® 3 Implant System</th>
</tr>
</thead>
<tbody>
<tr>
<td>A system that restores hearing sensation for adults with at least a bilateral moderate-to-profound sensorineural hearing loss who only receive limited benefit from hearing aids.</td>
<td>A system that blends cochlear implant and hearing aid technology for adults with severe to profound high frequency (ski slope) hearing loss.</td>
<td>An osseointegrated auditory implant system for individuals with unilateral profound hearing loss (single sided deafness or SSD), mixed or conductive hearing loss.</td>
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Cochlear Nucleus CP810 Sound Processor  
Cochlear Freedom Hybrid Sound Processor  
Cochlear Baha 3 Sound Processor (BP100)
Demographic Trends: Developed Countries

AGE DEMOGRAPHICS IN DEVELOPED MARKETS

- 80+
- 65 To 80
- 50 To 64
- 30 To 49
- 18 To 29
- 3 To 17
- Under 3

F01 F02 F03 F04 F05 F06 F07 F08 F09 F10 F11 F12
Bilateral Implants

- Two ears are better than one
- Significant benefits to binaural input
- Continued growth in developed economies (~25% of all registered surgeries)
Bimodal use is on the rise

Rationale for bimodal fittings:
- Expanding candidacy criteria
- Improved CI technology/performance
- Improved power aids with DSP + feedback cancellation

Potential benefits:
- Better hearing performance in background noise\(^1\)
- Music appreciation\(^2\)

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Current look at cochlear implant candidacy
Candidacy Criteria – Cochlear Implants

- At least a **bilateral moderate-to-profound sensorineural hearing loss**. People with unaided audiological results within the shaded area on the chart, should be considered candidates for referral. It is recommended that their functional hearing should also be assessed.

- Less than 75% correct phonemes on open-set, pre-recorded sentence materials presented at 65 dBSPL in the best aided condition.

- No upper age limit for referrals.
A shift in the way we think…

- 30 years ago candidates had different audiological profiles
- 30 years ago only aim was restoration of access to sound
- Loss of residual hearing was taken for granted
- Today, “Primum non nocere” – First do no harm
The cochlear implant basics

Two components of a cochlear implant:

1. An internal implant placed just under the skin, behind the ear
2. And an external sound processor
How a cochlear implant works
Cochlear™ Nucleus® 5
with Nucleus® CI24RE Series Implants

World Leading Hearing Performance
CP810 sound processor

- Three different battery options providing up to a day’s battery life
- Dual colour LED indicator to show alerts and diagnostics
- Controls can be accessed by the buttons on the processor – these buttons may also be locked if required.
- The processor also has tamper resistant locks designed to reduce the likelihood of children disassembling the processor.
**CP810 tamper resistant features**

- Standard battery module, standard rechargeable battery module and compact battery module can all be locked to the processing unit.

Move latch under accessory socket to the **Left side** to **Lock** the battery module to the processing unit. Move the latch to the right side to **unlock** the battery module.
Listening Performance

• Accessories to improve the hearing experience
For the CP810…….

1. Plug the processor-end connection for direct attachment into accessory socket first!

2. Attach the ML14i or audio accessory cables, FM cables (with Freedom accessory adaptor) and Euro accessory adaptor and check sound.
Dynamic ear-level FM options for CP810

1. MLxi: CP810 processor* and Euro Adaptor
2. ML14i: CP810 processor*

*Ear-level Dynamic FM devices only compatible with CP810’s shipped latter 2011. Please check with your Cochlear representative for information regarding Dynamic FM compatibility.
Nucleus 5 Sound Processor (CP810)

Design

MORE WATER RESISTANT THAN EVER BEFORE

Relax with the new water protection

• Withstands humidity, sweat
• Tested to international standard IEC 60529
• Rated IP57* protection against full submersion in water**
• Rated to IP44* protection against splashing water (e.g. rain)**
• Use of Aqua Accessory product for swimming

* CP810 Sound Processor is not tested and approved for swimming, diving or other permanent exposure to water.
** When using a rechargeable battery module, the CP810 Sound Processor has a dust and ingress protection rating of IP57. When using a standard battery module (with disposable batteries), the CP810 Sound Processor has a dust and ingress protection rating of IP44.
Cochlear™ Nucleus® Aqua Accessory

- Single use plastic sealable pouch
  - Available in 5 and 30 packs
- IP68 4 metres for 2 hours
  - Including in saltwater, chlorine, soapy water and lakes
- Compatible with CP800 sound processors
  - No upgrades required
  - Designed for rechargeable batteries only
What is Aqua Accessory?

- The world’s first behind-the-ear waterproof accessory!
- Single use, clear plastic, sealable pouch
  - Available in 5 and 30 packs
- IP68 ingress protection rating in 4 metres of still water for 2 hours
  - Including in saltwater, chlorine, soapy, lakes, mud (anything safe for skin contact)
- Compatible with CP800 series sound processors
  - No upgrades required
  - Designed for use with rechargeable batteries only
- Warranty expanded to cover full submersion when using the Aqua Accessory
Design Aspects

- "Soft touch" material for optimal comfort behind the ear.
- Transparent material for easy monitoring of the processor and safety.
- Retention grommet designed for use with a safety line.
- "Quick tear" notch for easy opening after use.
- "Peel and seal" 3M adhesive flap to prevent accidental opening during use.
Nucleus® 5 Remote Assistant (CR110)

Monitor

ONE BUTTON CHECK

Press the 'Cochlear' button to check the status of the processing unit, battery module, coil and coil cable

- Parents can see at a glance that their child’s processor is working correctly
- Check remaining battery life
- See microphone response
- Test coil
- Check / Set mixing ratios
Cochlear Nucleus CR110 Remote Assistant

Monitor

SETTINGS AND ALERTS

- Lock / unlock BTE keys
- Telecoil mixing ratio
- Accessory mixing ratio
- Private tones
- Out of range
- Battery low
- Coil off
- Sound OK
The Cochlear Implant Portfolio

CONVENTIONAL COCHLEAR IMPLANT INDICATIONS

CI24RE with Contour Advance electrode

CI422 with straight electrode (half-band)

CI24RE with straight electrode (full-band)

SPECIAL INDICATIONS

Hybrid L24 electrode

Double Array electrode

ABI24M Auditory Brainstem electrode
Nucleus CI24RE with Contour Advance electrode

FOCUSED STIMULATION

• Extensively researched electrode length for excellent hearing zone coverage\textsuperscript{1-3}
• 17 mm length targets majority of spiral ganglion cells\textsuperscript{4} for effective frequency coverage

CI422 with straight electrode

- DESIGNED FOR ATRAUMATIC INSERTION
- FULL LENGTH, STRAIGHT ARRAY

Atraumatic surgery

• For traditional candidates aims to preserve anatomical and physiological structures

• For candidates with residual acoustic hearing aims to preserve residual hearing
Why preserve hearing?

• Provides Prosody:
  
  Lexical meaning of speech
  Stress: English is a stress based language (Syllable stress can change the meaning of a word eg, CONvict vs conVICT)
  Accentual language: Japanese
  Tonal language: Cantonese or Mandarin

• Vocal Monitoring
  
  Assists in developing auditory-vocal monitoring systems
  Timing
  Melody patterns
  Nasality
Why preserve hearing?

• Residual low-frequency hearing has been associated with improved hearing performance in background noise
  Assists in segregating competing voices
  Detects signals in masking noise

• Music
  Identify timbre of musical instruments
  Tonal or sound quality
  Musical pitch of notes (Melody)
  Rhythm
Why preserve hearing?

• Environmental Awareness
  Most environmental sounds have a broad frequency spectrum
  May assist safety
  Some awareness when speech processor off

• Recognition of emotion state of the speaker is carried on frequencies under 600 Hz
  Love, anger, amusement, fear, astonishment
What is the Cochlear™ Hybrid™ System?
Cochlear Hybrid System with CI422 Implant

- Three key components:
  - CI422 Implant
  - Hybrid Sound Processor
  - Custom Sound Software
So what does this mean for you?

- Support parents as counselling from professionals change

- Recognise your students may have significant residual hearing even in cochlear implant off condition

- Possibly managing more technology (bimodal in the one ear)

- The audiogram still part of the candidacy picture, but only part of it.
Expanding Criteria: Where next

- CI for SSD??

- Emerging body of research
What May the Future Hold?
Access
Connectivity
Sound Processing
Sound Processing
Invisible Hearing
One day: Invisible hearing?
(Not an approved product)
Invisible Hearing (not an approved product)

Tiki - Totally Implantable Research CI

Invisible Hearing

- Integrated Implantable Microphone
- Integrated Rechargeable Battery
- Integrated Digital Signal Processor
About Cochlear™ Baha®
Baha Candidacy
Key Indications for Baha

The Baha System can be an effective solution for people with the following hearing impairments:

1. **Conductive Loss**
2. **Mixed Loss**
3. **Single Sided Deafness (SSD)**
Cochlear Baha 3 System

The Baha System has three components:

1. **SOUND PROCESSOR** - picks up sound and converts to vibration
2. **ABUTMENT** - transfers vibrations from sound processor to implant
3. **IMPLANT** - titanium, placed in bone behind ear where it osseointegrates and transfers vibrations directly to cochlea via bone conduction
Osseointegration

• With a Baha implant, the bone and implant fuse, resulting in excellent stability and effective transfer of sound
• 2 weeks between surgery and fitting
Cochlear™ Baha® 4 Abutment

Advanced stability of bone AND soft tissue

Upper part left uncoated for cosmetic reasons.

Hydroxyapatite coating to enhance soft tissue stability through a tight adherence with dermis.

Concave shape to stabilise soft tissue as suggested in the literature.1

TiOblast™ surface for rapid osseointegration.

No soft tissue reduction

2 weeks loading of BI300 implant

Cochlear Baha Portfolio

1. Must have symmetrical bone conduction thresholds.
2. 4-frequency average across .5, 1, 2, and 3 kHz.
Baha Softband

• Designed to be used for babies and young children as a first step in hearing, until they can have implant surgery.

• Baha offers a complete solution that grows with a child. Starting with the Baha Softband for young babies to the implant for older children to adulthood.

• Pressure of band is adjustable and the position of sound processor can be varied.

• Provides bilateral fitting option.
LEDs give confirmation of processor settings and status

Keylock stops accidental switch offs or surprising volume changes

Safety line secures to clothing to prevent loss

Wide selection of softband colours and patterns

Optional tamper proof doors keep battery from being accidentally removed or dislodged

FM system compatible

Baha 3 - Child friendly solutions
Resources
Troubleshooting resources

Habilitation resources

http://www.cochlear.com/wps/wcm/connect/au/home/support/rehabilitation-resources/rehabilitation-resources
Online store
Cochlear Professional Website

Welcome to the Professionals Website

The Cochlear™ professionals site is a specialised resource center for hearing health professionals who work with Cochlear’s innovative portfolio of implantable solutions. Whether you would like to know the latest news and events or need to access the latest professional and consumer product information - you will find it here. We hope you find this site an invaluable resource that supports your day-to-day use of our products.

Nucleus® System
- For your patients
- Brochures and documents for you
- Manuals and troubleshooting

Hybrid™ System
- For your patients
- Brochures and documents for you
- Manuals and troubleshooting

Cochlear® single-chip residences
- Electrode portfolio
- Implant bed preparation
- General information

Bahá’í System
- Who is a Bahá’í candidate?
- Products
- Support
- Become a Bahá’í professional

Hear now. And always.
Hear now. And always