

Clinic overview

- The Hearing House supports cochlear implant (CI) recipients across a large catchment area that extends 300km from their Auckland clinic.
- Over 800 adult recipients and 300 paediatric recipients aged 0-19 years.
- The Hearing House uses a 'person-centred' outreach care model to make recipient services and care more accessible.
- Children are seen more frequently than adults for ongoing care, but every CI recipient is offered services at least once a year.

Clinic challenges

- Almost half of recipients live outside Auckland and face extensive travel time to attend face-to-face clinic appointments.
- While The Hearing House already provides outreach and telehealth services, the clinic and recipient benefits of introducing Remote Check were uncertain.



Case study: The Hearing House, New Zealand

Overcoming geographic barriers to cochlear implant care using Cochlear™ Remote Check

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Overview

The Hearing House is a charity organisation headquartered in the upper North Island of New Zealand, dedicated to fostering a community of support, empowering people with hearing loss and their whānau¹ to explore their potential and make informed choices on their journey.

Established in 1998 to provide auditory-verbal therapy for children with hearing loss, the facility expanded over the following two decades to become a centre of excellence and research. The Hearing House offers a comprehensive cochlear implant programme, specialised therapy and outreach clinics to 1,100 adult and paediatric CI recipients, or kiritaki². Many of these services are publicly funded by the New Zealand Ministry of Health through the Northern Cochlear Implant Programme.

The Hearing House strives to offer 'whānau¹-centred' intervention, where the family is considered essential to achieving success. With a strong focus on collaboration and innovation, The Hearing House is addressing the challenges that families face and better supporting recipient outcomes by utilising a range of remote programming and remote tele-therapy services. The Hearing House was the first centre in New Zealand to offer Cochlear™ Remote Check, a virtual assessment tool which allows CI recipients to complete a hearing health check at a convenient time and place, without visiting the clinic. As of early 2022, The Hearing House has over 100 recipients using Remote Check.

The Hearing House has found that recipients and families view Remote Check positively, especially those who live long distances from the clinic. Remote Check is being used to break down barriers to CI referral based on concerns about recipient access to care and follow up from a distance.

Background

Almost half of The Hearing House's recipients live outside Auckland, creating travel stress and financial costs to attend clinic appointments. In some cases, this can cause recipients to arrive in a less-than-optimal state to receive care. For these reasons, making services more accessible has been a high priority for the centre.

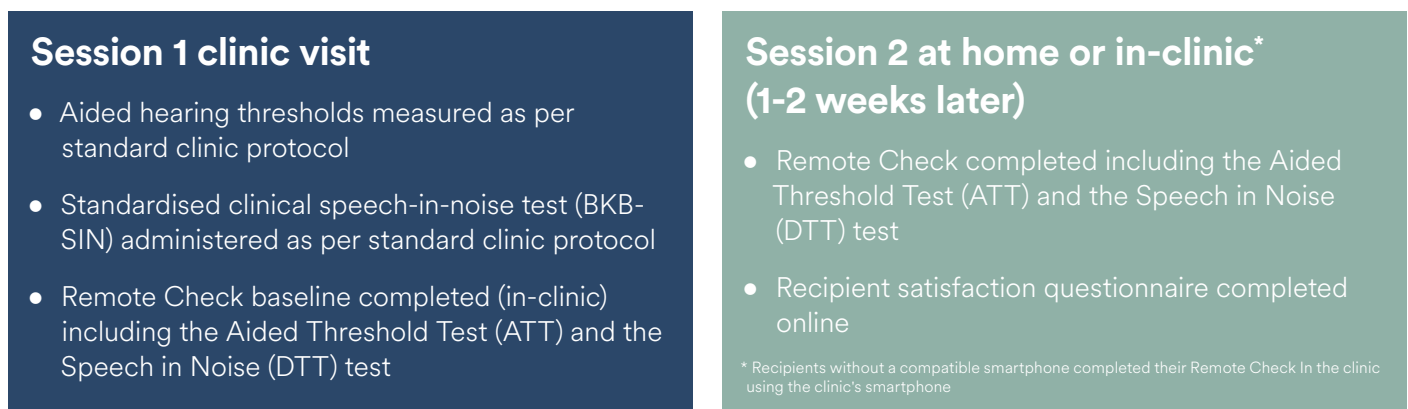
The Hearing House has established several outreach clinics at various locations outside Auckland and remote programming appointments are offered using remote access technology. In addition to audiology services, a team of speech therapists/hearing therapists provide rehabilitation and counselling for children and adults using tele-services or remote site visits. To further expand its remote care services, The Hearing House evaluated the clinical effectiveness of Remote Check through a pilot conducted in late 2019.

Remote Check pilot study

Method: Following ethics approval from The University of Auckland, a pilot study was conducted to evaluate the reliability of Remote Check as an 'at-home' measure of CI function, comparing Remote Check outcomes with baseline in-clinic measures over two separate sessions.

Nine adolescents (mean age of 15.0 years with a range of 10.9 - 18.4 years) with one or two CI's, a Nucleus® 7 Sound Processor and at least twelve months' experience with a CI were invited to participate in the study. The mean duration of CI use was 9.4 years with a range of 1.6 - 17.7 years. For those using bilateral CI's, only one CI device was tested. Testing occurred over two sessions as per the schedule shown in Figure 1.

Figure 1: Pilot study schedule



Results: Remote Check results were compared across the two sessions and against in-clinic measures. All participants showed acceptable aided thresholds on the clinical audiogram (i.e., thresholds at or below 35 dB HL). As expected, all showed better aided sound detection with the Remote Check audiogram compared to the clinical audiogram. Seven participants completed the ATT in Remote Check across both sessions and thresholds showed high repeatability. On average, across all frequencies, all aided thresholds were within -0.14 to 0.52 dB of each other (range of -2.17 to +3.65 dB HL). The high level of repeatability between the baseline and follow-up Remote Check audiograms gave reassurance that Remote Check is reliable and sensitive to changes in sound detection thresholds for CI recipients.

Eight adolescents completed the Digit Triplet Test (DTT) in Remote Check and when compared to the BKB-SIN SRT, as expected, the DTT SRT group average was 8.7 dB better than the BKB-SIN SRT (range 2.8 to 16.8 dB SNR). When the DTT was compared across two Remote Check sessions, there was high repeatability shown between test scores. On average, the second Remote Check DTT SRT was 0.03 dB better when compared to the baseline Remote Check DTT (range -1.6 – 1.4 dB SNR). The DTT appeared well suited to the Remote Check format, and it was encouraging to see a high level of repeatability between DTT results for the baseline and follow-up Remote Checks.

Responses on the satisfaction questionnaire were overwhelmingly positive with participants reporting high levels of enthusiasm at the prospect of completing hearing checks at home. Constructive feedback was shared relating to operational aspects which have been improved upon in newer iterations of the Remote Check app.

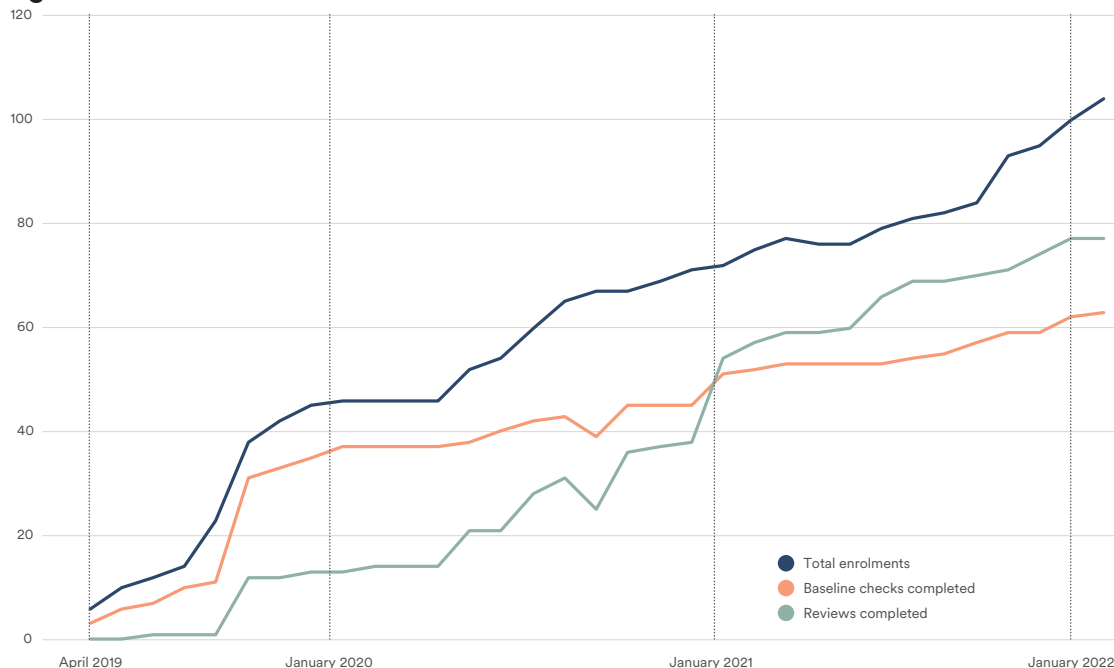
Overall, the pilot study suggested that Remote Check provides useful clinical information about a CI recipient's hearing status, and while results do not exactly replicate those from in-clinic measures they were clinically comparable. More importantly, high repeatability was shown between Remote Check sessions, suggesting Remote Check is sensitive to changes in hearing and can therefore be a useful clinical tool to aid in monitoring recipients' hearing, troubleshooting, and triaging for in-clinic appointments.

Remote Check implementation

Based on the results of the Remote Check pilot, The Hearing House adopted Remote Check into their routine care model for teen and adult recipients capable of managing the technology. Remote Check was used for troubleshooting and monitoring of datalogs and usage information.

Enhancements to Remote Check then enabled clinicians to customise activities for individual recipients, and with this flexibility The Hearing House expanded the use of Remote Check to include a wider cohort of recipients, including child recipients. This expansion resulted in a steady increase in Remote Check enrolment numbers over time as shown in Figure 2.

Figure 2: Remote Check enrolments



Clinical use of Remote Check

- Assessing progress of teenagers and adults during first 12 months of CI use
- Ongoing hearing monitoring for teenagers and adults after the first year of CI use
- Troubleshooting
- Device usage and datalog monitoring especially for babies and preschoolers
- All recipients with a Nucleus 7 or Kanso 2 Sound Processor and a compatible smartphone are routinely enrolled in Remote Check

Remote Check clinic snapshot

- Over 100 recipients enrolled for Remote Check with 77 checks completed and reviewed
- The oldest recipient to have completed a Remote Check is 81 years old
- An even split of recipients located in and out of Auckland have completed a Remote Check
- Most Remote Checks result in no further action required, with less than 10% requiring a follow-up clinic visit

Clinic experience and learnings

- Consider the initial learning curve for staff and recipients and allocate time to practice and upskill to the new technology
- Remote Check is not available for everyone, so selection criteria and eligibility checks are required
- Clinic test measures and Remote Check test measures are not identical, so use Remote Check data to supplement rather than replace in-clinic performance testing
- Introducing Remote Check first to recipients within the clinic setting helps them develop the confidence to complete follow-up checks at home
- Remote Check is a great way to help families see progress and maintain efforts at being accountable for device usage

Conclusion

Remote Check was implemented at The Hearing House to make recipient-centred care delivery more accessible and flexible. It has provided the clinic with resource savings by reducing the need for some in-clinic visits and has supported the expansion of clinical services without significant additional cost. Having a solution like Remote Check has brought peace of mind for many recipients, offering them more flexibility and choice in how they receive care.

As the number of recipients with compatible sound processors and smartphones continues to increase, and confidence with smartphone and app usage grows, The Hearing House will look to find additional ways to leverage Remote Check with even more recipients. This may have a positive cascading impact on their ability to reach and serve increasing numbers of recipients with greater efficiency.

1. Whānau is the Māori term for family

2. Kiritaki is the Māori term for client or customer

For information regarding the sound processors, implants, operating systems and devices that are compatible with Cochlear's Remote Care services, visit www.cochlear.com/compatibility

This material is intended for health professionals. If you are a consumer, please seek advice from your health professional about treatments for hearing loss. Outcomes may vary, and your health professional will advise you about the factors which could affect your outcome. Always read the instructions for use. Not all products are available in all countries. Please contact your local Cochlear representative for product information.

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