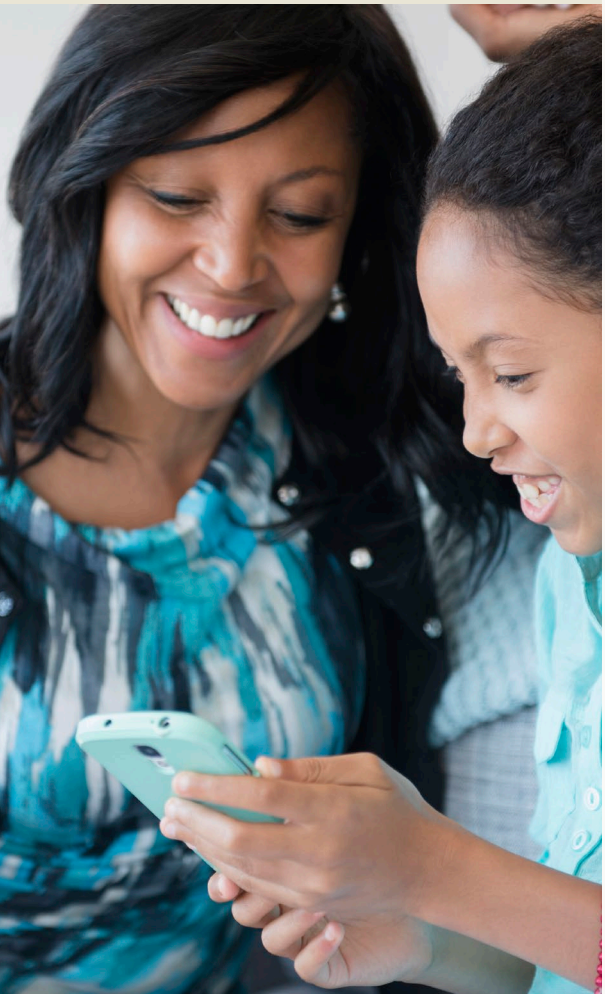
Clinic overview

- 500 maintained paediatric cochlear implant patients aged 0 to 19 years.
- Growing by 60 patients per year, mostly with bilateral cochlear implants.
- Patients receive a comprehensive (re)habilitation package including regular in-house speech and language intervention and audiological management.
- Patients are offered five programming sessions in the first two years after surgery, transitioning to annual appointments thereafter.

Clinic challenges

- The need for more effective resource management with patient numbers growing, but clinical staff numbers and facilities remaining unchanged.
- Increasing demands on clinician time due to more patients with complex medical requirements, cochlea malformations and socially complex backgrounds.



Case study: The Midlands Hearing Implant Programme - Children's Service United Kingdom

Optimising post cochlear implant care for children using Remote Check

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Overview

The Midlands Hearing Implant Programme Children's Service (MHIPCS) in the United Kingdom manages an ever-growing number of children and young people with cochlear implants (CIs), who require lifelong clinical support to maintain their hearing performance. The service wanted to increase clinical capacity for patients with more complex needs, pre-implant assessments, and programming for patients in the early stages of implant use and those who need to be seen more urgently.

In 2018 MHIPCS began piloting Cochlear™ Remote Check, an app based solution which allows CI recipients to complete a hearing health check at a convenient time and place, without visiting the clinic. Since then, Remote Check has been incorporated into the service's clinical pathway.

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Background

MHIPCS manages around 500 children with CIs between the ages of 0-19 years. Typically, another 60 children receive implants and are added to the programme each year. Once children receive their CIs, they are routinely offered five programming sessions before they reach two-years post-implant. From then, they are seen annually until they transfer to an adult service at Queen Elizabeth Hospital, usually at the end of school Year 11 (age 16).

In the past, the service has faced several challenges in managing the increasing CI patient volume, described below:

- Increased demand for programming appointments due to increased surgeries, of which the majority are bilateral surgeries
- Increasing numbers of children requiring additional clinical time due to highly complex medical requirements linked to extreme prematurity, neurological disorders, mitochondrial disorders, profound multiple learning difficulties (PMLD), cochlea malformations and also those with socially complex backgrounds
- 7-10% of caseload accounted for by non-attendance, with those patients potentially experiencing poor hearing performance due to lack of follow-up care
- No significant increase in whole time equivalent (WTE) clinical staff planned for the foreseeable future
- Waiting list administration being performed by clinical staff due to admin team staff shortages

In addition, the service is committed to improving equity in patient access to care, recognising that:

- Many families need to take time out of work and school to attend appointments and can incur significant travel costs, even if they live locally
- Over 20% of families live further than 40km from the service and therefore have to travel significant distances

As part of a wider effort to improve the post-implant pathway, MHIPCS incorporated Remote Check to increase clinical capacity and ultimately reduce programming waiting lists.

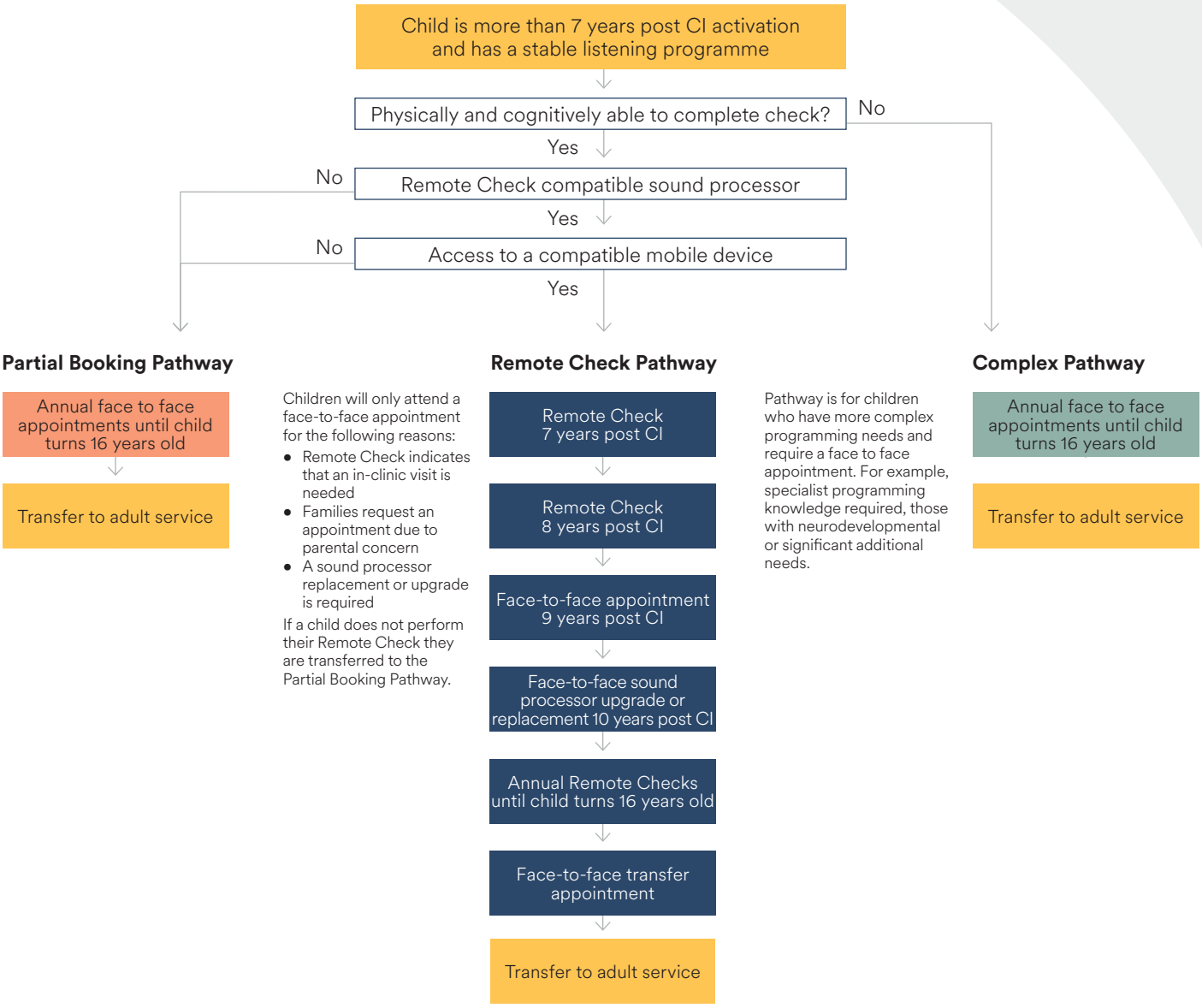
Implementation

Remote Check was first piloted at MHIPCS in December 2018. In March 2020, with the advent of the COVID-19 pandemic, Remote Check was used as an alternative for those unable to access face-to-face appointments. Remote Check continued to be used in parallel with face-to-face reviews until it became firmly embedded into MHIPCS's clinical pathways in July 2021. Three pathways were created for Remote Check, which are detailed in Figure 1. This case study will focus solely on the Remote Check pathway for eligible long-term, stable users. Stable users are defined as children who have been using their cochlear implants for at least seven years, with 22% of patients in this cohort meeting the criteria for Remote Check. The seven year period was chosen to reflect both sound processor upgrade timing and patient age.

Figure 1: Remote Check use cases at MHIPCS

Primary care option for eligible long-term, stable users	Blended care option during early CI activation phase	Requested Remote Check
Enabling a remote pathway for children who have had their implant more than seven years. Children are selected to complete the full test battery on Remote Check and must meet the following criteria: • Have a stable listening programme • Be physically and cognitively able to complete the check themselves	Providing customised tests for newly implanted children. Families can choose to complete a customised test battery on Remote Check to provide reassurance (for example, function of the implant). In addition, problems such as poor datalogging can be identified early and resolved.	Delivering remote monitoring for children who have had their implant less than seven years in between clinic programming visits. Families can request a Remote Check to provide reassurance or to identify whether their child needs to be seen in clinic.

Figure 2: Primary care pathway for eligible long-term, stable users



Remote Check pathway for eligible long-term, stable users

To implement the pathway, a protocol was developed and a waiting list of eligible patients was created, with time allocated. Time is allocated for audiologists and administrative staff to perform Remote Check associated tasks.

Initially MHIPCS planned for Remote Check to be alternated with a face-to-face appointment on an annual basis for each patient, however clinicians found Remote Check to be sensitive in identifying issues that require a programming review. As a result, clinic pathway protocols were changed, and the service now sees children routinely via Remote Check for, on average, two out of every three annual reviews. Children with sequential implants are placed on a different pathway (blended care option during early CI activation phase) until they have a stable MAP and then reverted back to the pathway they would have been on based on their first CI.
As in-clinic performance tests (e.g. adaptive speech perception testing, adaptive SPIN, localisation) are done every three years for children who are able to complete them, clinicians are comfortable with the new pathway. Children are seen in the clinic for programming reviews if requested by their family due to hearing concerns, if their clinician deems it necessary from the results of their Remote Check, or if they are due for a processor replacement or upgrade.

During the first seven months of the Remote Check roll-out at MHIPCS, 33% of Remote Checks were completed, 42% were not completed, 21% were unable to complete due to technical issues, and 4% were not developmentally able to complete (too young but still over seven years old). The reasons for non-completion were typically patient related (e.g.: confidence, comfort with technology) and most of these patients booked an appointment through the Partial Booking pathway instead.

Service impact

MHIPCS has used Remote Check to provide annual reviews for children who have had their implant more than seven years. It has also been helpful for ad hoc checks in children in this same group (and for younger children who might have a customised test battery), where there are concerns that they are not hearing optimally, to check data-logging and to identify whether they need to come into clinic.

Remote Check has had the following impacts on the service:

Released clinical time for complex programming and pre-implant assessments

It takes an audiologist approximately 20 minutes to review a child's Remote Check results compared to a 90 minute face-to-face programming appointment. MHIPCS currently invite five children a month to complete a Remote Check. If all checks are completed, reviewing the results would take an audiologist 1 hr 40 mins compared to 7 hrs 30 mins if the children were seen face-to-face. This could potentially release six hours of clinical time each month for four extra CI review appointments with one audiologist, or two pre-implant assessments with two audiologists.

Improved access to care

Remote Check has provided access to care for families who are unable to travel to the clinic or who live a significant distance from the clinic. It will also help them reduce travel costs which is even more pertinent since Birmingham launched its Clean Air Zone in June 2021, an initiative to discourage polluting vehicles from entering city zones by charging daily travel fees.[1]

Improved patient satisfaction

In line with the trend towards telehealth, Remote Check offers greater accessibility, flexibility and convenience for busy families and their children.

Reduced waiting times

The Remote Check pathway for long-term, stable users (Figure 2) has led to reduced waiting times for routine programming appointments and annual reviews.

Driving digital transformation

Reducing the number of in-clinic appointments is helping the clinic to meet National Health Service (NHS) targets for service delivery through telemedicine, reduce the NHS carbon footprint, and prepare children and their families for future telehealth platforms.

There may be initial reluctance for some families, particularly those with a long-standing relationship with the clinic, to transition to Remote Check as they may feel they are receiving a less optimal service. To support families, the service offers an additional face-to-face appointment with an audiologist to help the family complete their first Remote Check. MHIPCS also ensures that each family is sent personalised feedback about their child's Remote Check and are fully informed of the next steps in their care plan. There is also the option for the child to join the Partial Booking (face-to-face) pathway and re-join the Remote Check pathway at any time. However, MHIPCS's experience has shown that all the families who have used Remote Check have been satisfied with the service and continue to use it.

In the first seven months of the Remote Check roll-out at MHIPCS, over a third of families chose to be early adopters and in 2021 Remote Check uptake had reached over 50%. Transformational change needs time to embed in team culture. Clinicians are now confident in the pathway and Remote Check will no longer be optional. A significant increase in Remote Check users is anticipated as families come to embrace digital healthcare as the new normal.

Conclusion

By digitising annual CI appointments and ad hoc reviews, Remote Check has enabled MHIPCS to improve service efficiency whilst maintaining high levels of patient satisfaction and care (based on patient feedback). Children can move effortlessly between the Remote Check and Partial Booking pathways, streamlining the post-CI pathway. Remote Check has allowed MHIPCS to continue with their family-led service and increase the telehealth offering to families. Remote Check use by MHIPCS continues to evolve and will become an integral part of the service pathway for children aged seven years and above, with a stable listening programme.

1. Birmingham City Council. Clean Air Zone timing and charges. https://www.birmingham.gov.uk/info/20076/pollution/1763/a_clean_air_zone_for_birmingham/4. [Online] 2021. [Cited: 15 December 2021.]