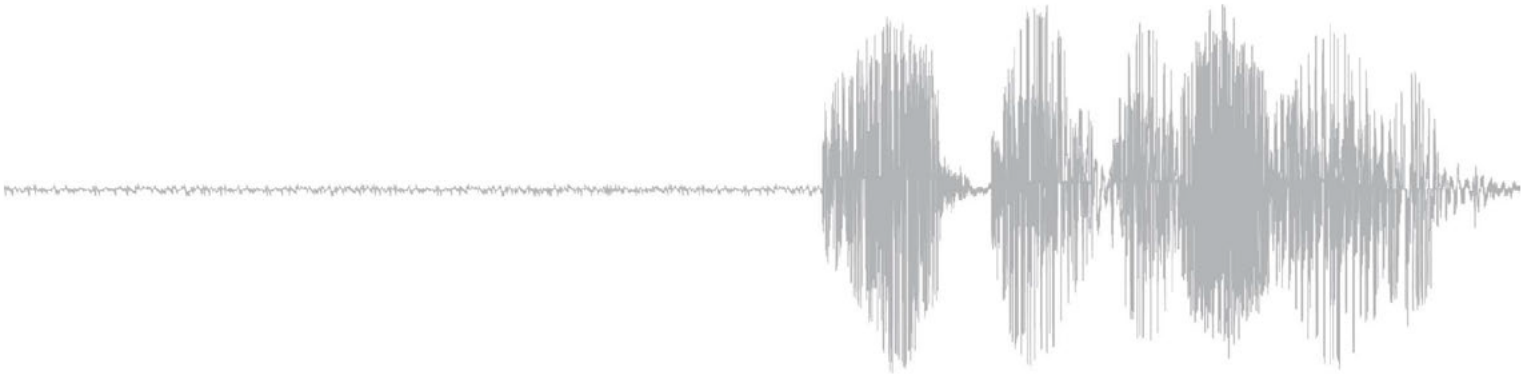

CLTD5791 - Android RC - CIP - V1.0 - 02SEP20

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Version: 2
State: Approved (T+B)
Approver: [redacted]
Date : 28 Sep 2020

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Number of pages (include Coversheet): 44

Clinical Investigation Plan

Investigation Title: A feasibility pilot, prospective, single centre, non-randomised, open-label, actual use testing study, assessing usability of Remote Check on Android phones when used by adult cochlear implant recipients.

Short Tile:	**Android RC**
CIP Number:	**CLTD5791**
Date:	**25 September 2020**
Sponsor	**Cochlear Limited** **1 University Avenue,** **Macquarie University** **NSW 2109** **Phone:** [redacted]

This clinical investigation shall be conducted in accordance with ethical principles that have their origin in the Declaration of Helsinki (World Medical Association, 2013), International Standard ISO 14155 Clinical investigation of medical devices for human subjects - Good Clinical Practice, and any regional or national regulations, as applicable.

Manufacturer	Cochlear Limited 1 University Avenue, Macquarie University NSW 2109 Phone: [redacted]
Principal Investigator	[redacted] Principal Research Audiologist Cochlear Limited 1 University Avenue, Macquarie University NSW 2109 Phone: [redacted]
Safety Contact	[redacted]

INVESTIGATOR AGREEMENT

Principal Investigator Approval and Declaration

By my signature below, I confirm my review and approval of this Clinical Investigational Plan (CIP).

I also confirm that I will strictly adhere to the requirements therein and undertake to ensure that all staff with delegated responsibilities in the conduct of this CIP have read, understood and will strictly adhere to the requirements therein. This CIP will not be implemented without prior written approval from the Ethics Committee, any applicable National Competent Authorities, and the Sponsor. If amendments to this plan become necessary, written approval by the Ethics Committee and any applicable National Competent Authorities will be obtained before the changes are clinically implemented per the amendment, except under emergency circumstances to protect the rights, safety, and well-being of subjects.

Name	**Title**
[redacted]	Principal Investigator
Signature	**Date**

TABLE OF CONTENTS

1 DEFINITIONS AND ABBREVIATIONS

Term	Description
ABI	Auditory Brainstem Implant
ADE	Adverse Device Effect
AE	Adverse Event
ANZCTR	Australian New Zealand Clinical Trials Registry
ATT	Aided Threshold Test
CER	Clinical Evaluation Report
CI	Cochlear Implant
CIP	Clinical Investigation Plan
CIR	Clinical Investigation Report
COVID19	Coronavirus disease 2019
CRF	Case Report Form
DD	Device Deficiency
DMC	Data Monitoring Committee
DTT	Digit Triplet Test
EC	Ethics Committee
eCRF	Electronic Case Report Form
EDC	Electronic Data Capture
EOS	End of study
FDA	Food and Drug Administration
FF	Free field
GCP	Good Clinical Practices
IB	Investigator's Brochure
ICF	Informed Consent Form
ICMJE	International Committee of Medical Journal Editors
IDMC	Independent Data Monitoring Committee
IFU	Instructions for use
IMD	Investigational Medical Device
ISO	International Organization for Standardization
NA	Not applicable
NSW	New South Whales
PCQ	Processor comparison questionnaire
PI	Principal Investigator
SADE	Serious Adverse Device Effect

Term	Description
SAE	Serious Adverse Event
SOP	Standard Operating Procedure
TGA	Therapeutic Goods Administration
USADE	Unanticipated Serious Adverse Device Effect

2 CLINICAL INVESTIGATION SYNOPSIS

Investigation title	A feasibility pilot, prospective, single centre, non-randomised, open-label, actual use testing study, assessing usability of Remote Check on Android phones when used by adult cochlear implant recipients
Short title	Android RC
Investigation number	CLTD5791
Name of investigational medical device(s)	Nucleus Smart App with the Remote Check for Android phones
Intended use of investigational medical device(s)	Regulatory status of the device: Pre-market The Remote Care System is intended to support clinicians to perform follow up hearing checks of their recipients remotely. The Remote Care system consists of a mobile application (Nucleus Smart) that may be installed by the recipient on a compatible iOS or Android device and operate in conjunction with a CP1000 or CP1150 Sound Processor. The Clinician schedules and reviews the at-home check results on the Professional Portal. The solution is intended to do the following: 1. The clinician to schedule a Remote Check through the Professional Portal 2. Recipient performs the Remote Check remotely via the Nucleus Smart App 3. Clinician reviews the Remote Check results in the professional portal and determines if a clinic visit is required
Name and description of comparator device/product(s)	Baseline Remote Check
Expected start date (first subject consented)	October 2020
Expected enrolment period	Up to 2 months
Expected duration per subject	Up to 6 months
Expected total duration of the clinical investigation	Up to 8 months
Number of subjects planned	15
Number of investigational sites planned	One
Inclusion criteria	1. Adults (≥18 years). 2. Implanted with the below cochlear implants in one or both ears. CI500 series (CI512, CI513, CI522, CI532,), CI600 series (CI612, CI622, CI632),

	Freedom series (CI24RE (ST), CI24RE (CA), CI24RE (CS), CI422), N24 Series Implants: CI24R (CS), CI24R (CA), CI24R (ST), CI24M. 3. At least 3 months experience with the cochlear implant. 4. Able to complete open set speech perception test as judged by the investigator 5. Willing and able to provide written informed consent.
Exclusion criteria	1. Unable or unwilling to comply with the requirements of the clinical investigation as determined by the Investigator. 2. Investigator site personnel directly affiliated with this study and/or their immediate families; immediate family is defined as a spouse, parent, child, or sibling. 3. Cochlear employees or employees of Contract Research Organizations or contractors engaged by Cochlear for the purposes of this investigation. 4. Currently participating, or participated within the last 30 days, in another interventional clinical investigation/trial involving an investigational drug or device.

Objectives and Outcome measures	
Primary Objective	**Primary Outcome measure**
To assess the ease of use of Remote Check on Android smart phones when used by adult Cochlear Implant recipients, in terms of usability and software issues, for the completion of primary tasks.	Proportion of subjects who, while using the final version of Remote Check on Android smart phones, are able to complete the primary tasks determined by an observer using a rating scale.
Exploratory Objectives	**Exploratory Outcome measures**
To characterise the test retest difference of Aided Threshold Test (ATT) and Digit Triplet Test (DTT) when streamed via Android smart phones.	• The test-retest difference for Aided Threshold Test (ATT) on Android smart phones • The test-retest difference for Digit Triplet Test (DTT) on Android smart phones

3 SCHEDULE OF EVENTS

Table 1: Schedule of events

Visit Type	Screening	Adaptive Phase[a]			EOS
		Study visit	Take Home use[b]	Follow up visit	
Timing of Investigation	**Day 0**	**Day 0 to month 6**	**Day 1 to month 6**	**Day 2 to month 6**	**Month 6**
Visit window (±)	NA	NA	NA	NA	+ 6 months
Written informed consent	X				
Eligibility	X				
Demographics, Hearing history, Device history, Medical history	X				
CP1000 / CP1150 fitting	X				
Complete tests available in App		X	X		
Usability evaluation		X			
Troubleshooting / issues analysis				(X)	
Return devices			X		X
Device exposure	X				X
Adverse Events	X	X	X		X
Device Deficiencies	X	X	X		X

Abbreviations: EOS = End of Study; X= mandatory activity; (X) = Optional activity

*[a] The adaptive phase will be conducted according to the procedure outlined in section 7.3**Error! Reference source not found.**. For new iterations of the App, the at home and clinical visit sessions may be repeated to ensure the remote care app and test implementation are suitable. There will be no more than 5 product iterations.*

[b]Assessment may be undertaken during a take home period or in the clinic. If the product is assessed during an 'in clinic' session then the subsequent 'study visit' and take home period will not be necessary.

4 BACKGROUND INFORMATION AND RATIONALE

4.1 Introduction

Clinical management of cochlear implant recipients involves programming, counselling, performance evaluation and habilitation. The standard practice for this management involves frequent clinical visits in the first year after implantation and annual visits for the rest of the recipient's life (Müller & Raine, 2013). In a typical follow up clinical appointment a clinician ascertains if there are issues related to the implant function, hearing performance or device use. This is done using telemetry tests, performance measurements, datalogs and by gathering feedback regarding potential high-risk areas. Any medical health issue that may affect the implant performance is evaluated by an Ear Nose Throat specialist consultation. Based on these evaluations clinical management is planned.

For the majority of cochlear implant recipients, the need for a follow-up visit to the clinic may be unnecessary after the first few years after implantation as performance and device functionality remain stable (Howe & Mawman, 2015). Clinical appointments incur costs in terms of time and money for recipients and in terms of clinic resources. For a recipient who does not need clinical intervention, the cost of a routine clinical visit after the first few years following implantation does not outweigh the benefit. For the clinic, conducting clinical appointments for recipients who don't need intervention may not be efficient use of resources.

Remote Check provides a means for the clinician to ascertain the need for clinic visit for their cochlear implant recipients using tests completed by the recipients at home. Remote Check comprises telemetry tests, performance measurements, datalog measurements and a set of questions requiring a subjective answer by the recipient or parent/carer on sound quality and other aspects of device use. Remote Check on iOS devices is available in many countries, however, given that there are CI recipients who also use Android phones there is a user need for compatibility of Remote Check with Android devices.

The current study aims to assess the ease of use of Remote Check on Android smart phones.

4.2 Findings of Previous Nonclinical and Clinical Studies

4.2.1 Nonclinical Data

The investigational device in this study is the Nucleus Smart App on Android smart phone when used with CP1000 or CP1150 sound processors. This application is assessed for their effect on the safety and efficacy as per the Cochlear's Product Risk Management Procedure [1] and in accordance with ISO 14971, "Medical devices – Application of risk management to medical devices". Bench verification and validation [2] has demonstrated that Nucleus Smart App on Android smart phone is safe and effective and does not contribute to an unacceptable risk. However, there is a need to evaluate the app with users in real world environments to assess the ease of use of the Remote Check function of the app.

4.2.2 Clinical Data

Warren, Nel, & Boyd, 2019 evaluated the Nucleus Smart App on iOS devices with 32 adult Cochlear Implant recipients. The participants rated ease of controlling or monitoring their sound processor with the Nucleus Smart App and the remote control for their own sound processor on a processor comparison questionnaire (PCQ). The PCQ used a visual analogue scale in which 0 represented the greatest preference for the participant's own sound processor's remote control and 100 represented greatest preference for the Nucleus Smart App. The average rating was 74.81 suggesting a significant preference for the Nucleus Smart App on iOS devices.

Evaluation of Remote Care and Nucleus Smart App with the CP1000 Sound Processor (CLTD5704) evaluated Remote Check functionality on iOS devices. A total of 32 subjects (53 cochlear implants), which included 28 adults and four children, participated in the study. The primary objective of the study was to evaluate the ease of use for Remote Check. Remote Check in the Nucleus Smart App on iOS platform was found to be easy to use by a significantly high proportion of participants. The secondary objective of the study was to evaluate Aided threshold tests (ATT) used for audiogram measurements and digit triplet tests (DTT) used to measure speech perception in noise. The ATT and DTT were conducted through direct stream with Remote Check. For comparisons, the ATT and DTT in-clinic equivalent tests were conducted via the free field (FF) in a sound treated room (booth). Each booth, including speakers, amplifiers and software, was calibrated regularly. The ATT was designed to improve the reliability of the test also increase the likelihood of lower thresholds with ATT, which is what was found in this study. Small differences seen between the DTT streamed and FF results were seen and may be explained by the differences in seating position of subjects. Several steps were taken to ensure that the sound reaching the subject's sound processor was at a uniform level such as a) seating in an immovable chair and b) asking the subjects to face the speaker; however subtle changes in the way subjects position themselves in the chair could lead to level differences.

Android Actual Use Clinical Investigation (CLTD5748) evaluated the Nucleus Smart App on Android smart phones. The primary objective of this study was to investigate adult Cochlear implant user experience with the Nucleus Smart app for Android smart phones and streaming feature and identify potential use errors. A secondary objective of this study was to investigate the usability of routine features made available in the programming software. The nine adult Cochlear implant recipients who participated in the study were able to perform the primary operating functions of the system. No use errors or difficulties related to safe use of the product were observed during the actual use testing.

4.3 Study Rationale

Previous studies detailed above have demonstrated that The Nucleus Smart App is easy to use on the Android platform and that Remote Check functionality within the Nucleus Smart App is easy to use on the iOS platform. The present study aims to evaluate the ease of use of Remote Check on Android smart phones.

Actual use testing: Remote Check allows the user to complete adaptive performance tests like ATT and DTT. These performance tests adaptively change the next stimulus based on the response from the user, thus the use of an app to run adaptive performance test is a unique situation where the user affects how the product functions. Usability testing of a recipient using the app under simulated

conditions alone does not expose the complexity involved in using the adaptive tests that changes the next step based on the recipient's response. Thus actual use testing, as suggested in FDA guidance for human factors testing (AAMI HE75, 2016), is necessary for usability testing during the development phase of software. The FDA guidance points out that actual use testing is particularly suited for the usability testing of systems like programming hearing aids or cochlear implant systems. This study will be using an actual use testing process for usability testing of Remote Check on Android devices.

Remote Check on Android smart phones will be evaluated for the first time in this clinical study, and evaluations will be undertaken on developmental versions of the app, with features and updates progressively made available throughout the study period. This study aims to investigate the ease of use of these developmental versions as per (AAMI HE75, 2018).

5 MEDICAL DEVICE INFORMATION

5.1 Identity and Description of the Investigational Medical Device (IMD)

The Remote Care system consists of a mobile application (Nucleus Smart App) that may be installed by the recipient on a compatible iOS or Android smart phone and operates in conjunction with a CP1000 or CP1150 Sound Processor. The Clinician schedules and reviews the at-home check results on the Professional Portal.

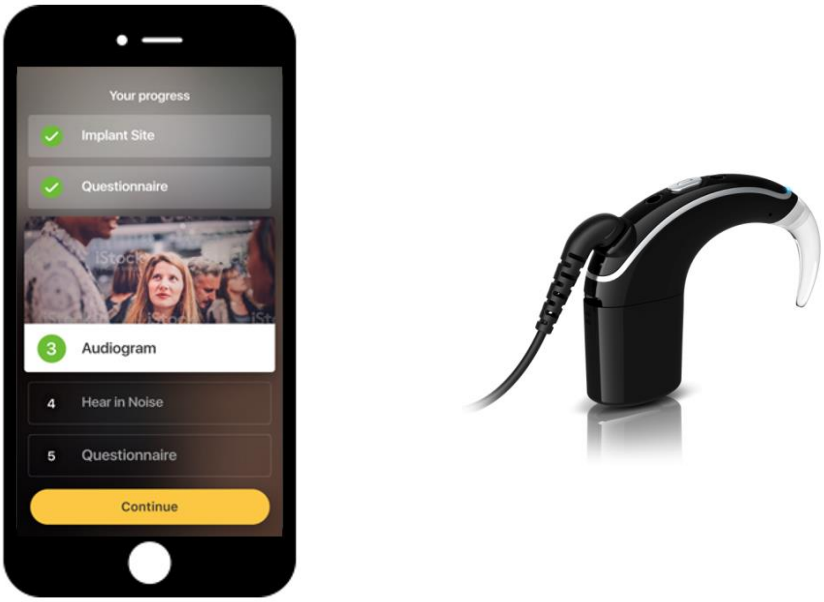
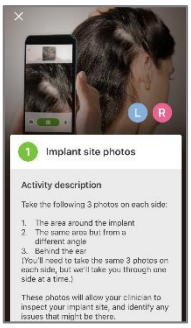


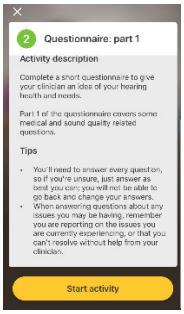
Figure 1: Image of Remote Check on a mobile phone (left) and, CP1000 Sound Processor (right)

Remote Check in the Nucleus Smart App includes the following tests that can be run by the recipient or their parent/carer at home. The results of the tests are sent to the clinician for analysis via the professional portal, and the results are intended to provide relevant information for the clinician to determine if the recipient needs to attend the clinic in-person or not.

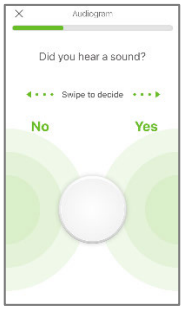
Photos: Recipients are asked to take two pictures of scalp over implant site and one behind the ear showing the surgical scar.



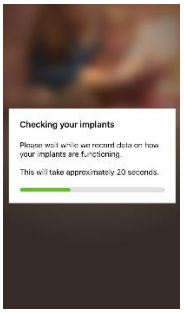
Questionnaire: Completion of a questionnaire that includes questions regarding any sound quality issues they are experiencing and any other issues that might require clinical intervention.



Aided Threshold Test (ATT): This is similar to an audiogram measured with the sound processor in use. Typical audiometric frequencies are streamed via Bluetooth from the iOS or Android device to the sound processor and the recipient is asked to indicate whether they hear the sound or not. The objective of the test is to determine the lowest level at which the recipient is able to detect the sounds at each frequency selected.

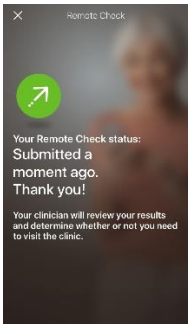


Telemetry measurements: Impedance and compliance telemetry measurements are performed by the sound processor to determine the health of the implant.



Digit Triplet Test (DTT): This is a speech perception test where the recipient listens to numbers in noise and responds to the numbers heard on the keypad on the app. The signals are streamed via Bluetooth from the iOS or Android device to the sound processor. The level of the signal and noise is varied adaptively to find the signal to noise ratio where 50% of the digits are correctly identified.

Datalogs: The sound processor logs the duration of use, the time spent in various environments, changes made to settings of the sound processors and the type of accessories used. The datalogs are transferred from the sound processor to the iOS or Android device so that they may be sent to the clinician for review.



The Remote Care system is indicated for use for Cochlear™ recipients of compatible Cochlear™ implants: CI500 series (CI512, CI513, CI522, CI532), CI600 series (CI612, CI622, CI632), Freedom series (CI24RE (ST), CI24RE (CA), CI24RE (CS), CI422 or or N24 Series Implants: CI24R (CS), CI24R (CA), CI24R (ST), CI24M cochlear implants using a CP1000 or CP1150 Sound Processor. A clinician will determine and enrol a recipient for Remote Check if they are suitable to perform the check.

The Remote Check feature will only be available within the Nucleus Smart App for those Cochlear recipients that have been enrolled by their clinician.

The Remote Care system is not supported for N22, N24, ABI or Double Array implants.

The download page for the app (Android version) will state that the app is exclusively for use in a clinical investigation.

The instructions for use of Remote Check on iOS devices is provided in the Nucleus Smart App User Guide Remote Check iOS

5.2 Identity and Description of the Comparator

Baseline Remote Check with Android smart phone will be used as a comparator.

5.3 Accessory Device Requirements

Table 2: List of accessory devices that will be used in this investigation

Device name	Purpose	Regulatory Approval status
Custom Sound Pro 6.2	Software to program the sound processors	Unapproved
CP1000 programming cable	Cable needed to program the CP1000 sound processor	Approved
CP1150 programming cable	Cable needed to program the CP1150 sound processor	Approved
Programming pod	Interface needed to program the sound processors	Approved
CP1000 Sound processor	Delivers the sound from the Nucleus Smart App for ATT and DTT and is needed to conduct other tests	Approved hardware Unapproved firmware
CP1150 Sound processor	Delivers the sound from the Nucleus Smart App for ATT and DTT and is needed to conduct other tests	Approved hardware Unapproved firmware

Android smart phones	To run the Nucleus Smart app for Android smart phones	Not a medical device

6 OBJECTIVES

6.1 Primary Objective

To assess the ease of use of Remote Check on Android smart phones when used by adult Cochlear Implant recipients, in terms of usability and software issues, for the completion of primary tasks.

6.2 Secondary Objective

There are no secondary objectives

6.3 Exploratory Objectives

- To characterise the test retest difference of Aided Threshold Test (ATT) when streamed via Android smart phones.
- To characterise the test retest difference of Digit Triplet Test (DTT) when streamed via Android smart phones.

7 DESIGN OF THE CLINICAL INVESTIGATION

7.1 General

This is an actual use usability, prospective, single-centre, non-randomised, open-label, single arm, non-controlled clinical investigation in adults using Nucleus cochlear implants.

The subjects include adults aged 18 years or above who are currently using a Nucleus cochlear implant. Subjects will be screened, and 15 eligible subjects will be enrolled in the clinical investigation. Eligible subjects will be asked to use the IDE with the help of the inbuilt instructions in the IDE.

After the first visit, subjects will attend scheduled study visits over a six-month study period to be assessed as described in the CIP Schedule of Events (Section 3). At study visits, subjects will undergo usability assessments and safety assessments. The primary outcome measure is to determine the proportion of subjects who, while using the final version of Remote Check on Android smart phones, can complete the primary tasks, as assessed by the investigator / observer using a usability rating scale. Safety will be assessed by recording and summarising all AEs/ADEs and DDs. No data monitoring committee will be used for this clinical investigation.

7.1.1 Design Rationale

- The study includes only adults so that they can provide feedback on the ease of use of the app.
- Only Cochlear implant recipients implanted with the CI500 series, CI600 series or Freedom series cochlear implants in one or both ears are included as the Remote Check system only supports these cochlear implants.
- The hearing ability and the MAPs undergo significant changes in the first three months after implantation. Thus, cochlear implants recipients with at least 3 months experience with their cochlear implant will be enrolled so that any changes in their hearing function do not act as confounding variables.
- The Remote Check includes a speech in noise test and thus only subjects who can complete open set speech perception test as judged by the investigator will be enrolled.
- Only subjects willing and able to provide written informed consent will be enrolled to be compliant with ISO 14155.
- Investigator site personnel directly affiliated with this study and/or their immediate families; immediate family is defined as a spouse, parent, child, or sibling or Cochlear employees or employees of Contract Research Organisations or contractors engaged by Cochlear for the purposes of this investigation will be excluded to avoid enrollment of a vulnerable population.

Adaptive procedure:

The IMD used in the study will be fully verified by bench testing to ensure safe and effective use with cochlear implant recipients. However, since this will be the first time Remote Check on Android Smartphones will be used by cochlear implant recipients themselves, there is a possibility that this first use uncovers product issues that were not known to date, like usability issues or bugs. The study will use an adaptive procedure to allow the use of unplanned product optimisations. If significant issues are identified that require optimisation or correction of the IMD, then further study sessions will be suspended, and the study will resume with the new device iteration. A new version of Remote Check will be issued, and participants will be asked to use the functions of the app to assess the usability of each test administration. The subjects who have already completed visit 1 procedures will be asked to repeat the visit using the new device iteration (see Figure 2).

Where optimisation is required to improve usability or performance (see Table 3), subjects will receive a new device iteration, and will be asked to re-complete the ‘take home use’ so that the Remote Check can be re-tested outside the clinical environment, and feedback can be received after each take-home period (see Figure 2).

While there are no expected unplanned product changes, early product can be sensitive to the low-risk issues identified in Table 3. Table 3 also identifies how issues will be investigated and retested by the research subjects. All product issues will be recorded as device deficiencies.

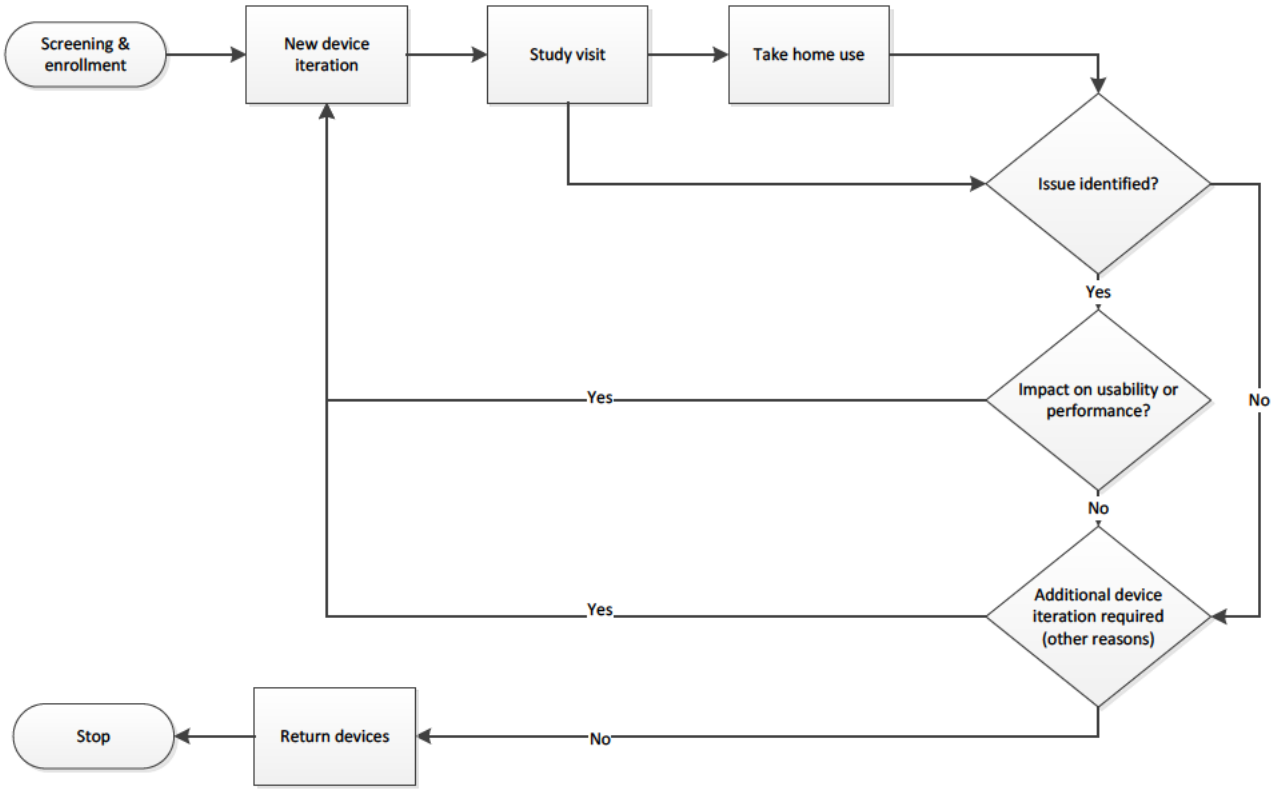


Figure 2: Flowchart of adaptive procedure

Table 3. Product adaptation categories and product issue examples

Category	Example of a product issue	Action
Connectivity - The App will be communicating with the Sound Processor directly via Bluetooth link.	Streaming tests in a particular environment does not work as expected resulting in inaccurate test results	If the test is designed to work in the environment described in the issue, the product will be updated and re-evaluated by subjects.
	Interruptions due to smart phone notifications (calls, messages, general alerts etc.) that affect the app and tests within the app	If the issue has an impact on performance or usability, the product will be updated and re-evaluated by subjects.
	Data upload issues due to unstable internet connection	If the issue has an impact on performance or usability, the product will be updated and re-evaluated by subjects.
	General connectivity issues between processor and Android smart phone	If the issue has an impact on performance or usability, the product

		will be updated and re-evaluated by subjects.
Sound quality – The App includes some tests that require optimal sound quality.	Study subjects may provide feedback on the sound quality of the tests (ATT or DTT) available with the Remote Check.	If the issue has an impact on performance or usability, the product will be updated and re-evaluated by subjects.
Product accuracy/performance – The App includes a test battery that is required to work optimally in order to produce accurate results.	Number of electrodes out of compliance collected via the app do not match those collected via Custom Sound	Comparison of the number of channels identified as out of compliance for each individual (App vs Custom Sound) will be undertaken. If there is any mismatch in the number of channels identified, the issue will be investigated, updated and re-evaluated by subjects.
	Questionnaire questions are misunderstood by study subjects	The misunderstanding will be clarified, and if the results collected are inaccurate the product will be updated and re-evaluated by subjects.
Usability and user acceptance – The App must be easy to use and intuitive.	The user interface is unclear and leads the study subjects to use the functions incorrectly	If an identified usability issue has an impact on performance or usability, the product will be updated and re-evaluated by subjects.
General bugs and product issues:	Unforeseen issues that are exposed through usage in a subject's home environment.	General issues will be judged on a case by case basis. If it is judged that the issue has an unacceptable impact on performance or usability, the product will be updated and re-evaluated by subjects.

7.2 Subjects

Written, informed consent must be obtained from each subject before any study procedures are initiated.

Eligibility of enrolled subjects must be supported by Custom Sound Pro records or device registration records that confirm the age, implant type and duration of implant use in the ear to be studied.

7.2.1 Inclusion Criteria

Subjects must meet all the inclusion criteria described below to be eligible for this clinical investigation.

1) Adults (≥18 years).
2) Implanted with the CI500 series (CI512, CI513, CI522, CI532,), CI600 series (CI612, CI622, CI632), Freedom series cochlear implants (CI24RE (ST), CI24RE (CA), CI24RE (CS), CI422) or N24 Series Implants: CI24R (CS), CI24R (CA), CI24R (ST), CI24M in one or both ears.
3) At least 3 months experience with the cochlear implant.

4) Able to complete open set speech perception test as judged by the investigator
5) Willing and able to provide written informed consent.

7.2.2 Exclusion Criteria

Subjects who meet any of the exclusion criteria described below will not be eligible for this clinical investigation.

1) Unable or unwilling to comply with the requirements of the clinical investigation as determined by the Investigator.
2) Investigator site personnel directly affiliated with this study and/or their immediate families; immediate family is defined as a spouse, parent, child, or sibling.
3) Cochlear employees or employees of Contract Research Organizations or contractors engaged by Cochlear for the purposes of this investigation.
4) Currently participating, or participated within the last 30 days, in another interventional clinical investigation/trial involving an investigational drug or device.

7.2.3 Number of Subjects Required

Fifteen subjects will be enrolled in the study to meet sample size calculation requirements stated in section 9.4 with the expected dropout rate (10%).

7.2.4 Vulnerable Populations

Not applicable for the current clinical investigation.

7.2.5 Enrolment & Study Duration

The following subject status definitions apply:

Screened: A consented subject who is being assessed for eligibility according to the Screening requirements.

Screen Fail: A consented subject that has been determined to not meet all eligibility criteria for enrolment.

Enrolled: Subjects who have met all eligibility criteria and have provided informed consent.

The enrolment period for the clinical investigation is anticipated to be up to 8 months from the time of first subject consent to enrolment of the last subject. This is to allow the replacement of any subjects who withdraw from the study.

The expected duration of each subject's participation in the clinical investigation is up to 6 months from the time of informed consent through to the End of Study when devices are returned. This is to allow testing of new device iterations as per the adaptive procedure described in section 7.1.1.

The anticipated total duration of the clinical investigation is therefore 8 months.

Clinical Investigation completion is last subject last visit.

7.2.6 Criteria for Subject Withdrawal

Subjects can decide to withdraw from the investigation at any time. The Investigator shall ask the reason(s). The reason for withdrawal should to be documented in the subject's source files and the case report form (CRF).

The Investigator or Sponsor may also decide to withdraw a subject from the clinical investigation if it is considered to be in their best interests.

Subject withdrawal may be for any of the following reasons:

- Adverse Event (AE)
- Device Deficiency (DD)
- CIP or GCP deviation
- Subject lost to follow-up
- Subject withdrew consent
- Subject death
- Sponsor decision
- Investigator decision
- Other (specify)

If subject withdrawal is due to problems related to the IMD safety or performance, the Investigator shall ask for the subject's permission to continue in safety follow up (i.e., adverse events) until their scheduled End-of-Study visit.

If a subject is lost to follow-up, every possible effort must be made by the study site personnel to contact the subject and determine the reason for discontinuation. At least 3 separate attempts taken to contact the subject must be documented.

Enrolled subjects who are withdrawn/discontinued will be replaced.

7.2.7 Randomisation Procedures

Not applicable

7.2.7.1 Blinding Procedures

As the objective of this study is to evaluate the ease of use of the IMD blinding is not feasible for the clinical investigation and this is unlikely to affect the study results.

7.2.8 Post-investigation Medical Care

As this clinical investigation is non-surgical in nature, no specific medical care will be provided for the subjects after the clinical investigation has been completed. Subjects will return to their routine clinical management at their local Cochlear Implant clinic after the final study visit. Subjects will use a loan CP1000 or CP1150 sound processor for the duration of the study. All clinical study devices will be returned at the end of the study. Subjects will return to use of their own sound processor and smartphone at the end of the clinical investigation.

7.3 Performance Evaluations and Procedures

The following procedures will be followed in this study. Table 1 in section 3 shows the schedule of events planned in the study.

Recruitment: Cochlear implant recipients will be identified by review of clinic records based on the eligibility criteria in section 7.2. The potential participants will be invited to the study and will be provided the informed consent form (ICF). Potential participants who are willing to participate in the study based on reading the ICF will be invited to attend a session at the study site.

Written informed consent: Prior to enrolment, potential CI recipient will be issued an ICF and the study information will be explained in full by the investigator, after which the recipient-participant can decide whether they consent to inclusion in the study or not. Informed consent will be obtained as per section 10 in this document.

Eligibility: After the consent form has been signed the investigator will record the eligibility of the potential participant to confirm their enrolment to the study.

Demographics, hearing history, device history and medical history: After the participant has been enrolled into the study, participant demographic information, hearing history, device history and medical history will be collected from the participant. Any additional information that cannot be obtained from the participant will be obtained from the participant's CI clinic as necessary. The participants' own processor will be connected to the commercially available Custom Sound fitting software and the participants' MAP will be saved to the site's database.

CP1000 / CP1150 fitting: The participant will be fitted with a CP1000 or CP1150 sound processor using the MAP, program and processor settings used in their own processor. Where necessary update to the MAP, programs or processor settings will be made.

Complete tests available in App: The participant will be enrolled into Remote Check and will be asked to complete the Remote Check activities within the android app.

Usability evaluation: Remote Check is designed to be easy to use for a cochlear implant recipient even if they have no prior experience in using the Nucleus Smart App. CI recipients with no prior experience in using Remote Check on Android smart phones will be enrolled in the study. No training will be provided to the participants on the use of the app; however, they will have the ability to access the guidance inbuilt in the app. The participants will be asked to complete the tasks within Remote Check. The investigator will facilitate the session and observer(s) will record any use errors as per summative usability test methods. The observer will rate the participant's ability to complete the primary tasks in Table 5 using the rating scale in Figure 3. The participant will be interviewed at the end of the session to assess their satisfaction. The usability ratings, observations and the log files will be analysed across to assess the learnability, efficiency, memorability, use errors and satisfaction as described in Table 4.

1	2	3	4	5
Unable to complete	Completed after using help document	Completed after trying an incorrect option	Completed after some exploration	Completed in first attempt

Figure 3: Usability ranking scale

Feedback will be gathered from participants about their experience of using the app with a questionnaire.

Table 4: Usability dimensions to be assessed

Dimension	Definition	Metric
Learnability	How easy is it for users to accomplish basic tasks the first time they encounter the design?	Task completion will be ranked and the use errors/issues observed will be recorded when software is used by participants with no prior experience in using the app.
Efficiency	Once users have learned the design, how quickly can they perform tasks?	Time taken to complete the tasks in the app will be recorded when app is used by participants for the second time.
Memorability	When users return to the design after a period of not using it, how easily can they re-establish proficiency?	Task completion will be ranked, and the use errors/issues observed will be recorded when app is used by participants for the second time.
Errors	How many errors do users make, how severe are these errors, and how easily can they recover from the errors?	Observation and video analysis of participants using the app.
Satisfaction	How pleasant is it to use the design?	The participant's satisfaction rating will be obtained in an interview with the participant.

Take home use: Study subjects will be asked to use and complete tests within the Remote Check outside the clinical environment where they need to complete the activities with no support or supervision from the investigator.

Troubleshooting / issues analysis: If the participant experiences issues with the app during take home use, they will be asked to attend a follow up visit to troubleshoot issues or gather greater details of the issues.

Adaptive Procedure: The study will use an adaptive procedure Section 7.1.1 provides details of the adaptive procedure used.

Return devices: After take home use if no issues are identified then the study subject will be asked to return the IMD to the study site either by courier or visiting the site. The data generated in the app during take home use will be collected from the returned devices.

Table 5: Primary tasks in Remote Check

Screen	Primary Tasks	Acceptance criteria	Additional areas of interest
Home screen	Identify that a Remote Check is due.	Subject can identify that Remote Check is due.	-
Burger menu	Start Remote Check	Subject can start Remote Check	Time taken for the entire Remote Check.
Photos	Take photos	Subject guide a helper to take the three required photos.	Ability to reject distorted photos
Questionnaire	Complete questionnaire	Subject can understand the questions and answer them.	Consistency of responses across the two runs.
ATT	Complete aided threshold test	Subject can complete the ATT and produce valid results	Time taken to complete ATT
DTT	Complete Digit triplet test	Subject can complete the DTT and produce valid results	Time taken to complete DTT

7.4 Safety Evaluations and Procedures

The risks and anticipated ADEs for the IMD, as identified in Section 8.3 of the CIP, will be assessed in the clinical investigation via reporting of all AEs/ADEs from the time of first subject first visit until last subject last visit.

Safety data adjudication may be conducted by the Sponsor's Medical Officer in accordance with the Sponsor's standard operating procedures.

Safety data adjudication may be conducted by an Independent Data Monitoring Committee (IDMC) in accordance with the defined Charter for operations.

7.4.1 Concomitant Medication and Therapies

Not applicable for this clinical investigation.

7.5 Equipment Used for Evaluation of Performance and Safety

No additional equipment apart from IMD and the accessory devices described in Section 5 will be used in this clinical investigation.

7.6 Sponsor Role in Conduct of the Clinical Investigation

Prior to commercially launching new technology, Cochlear conduct both pre-clinical and clinical testing to ensure the products meet quality and performance specifications. New product technology may include the implanted device, the external sound processor, fitting software or other devices such as smart phone applications or wireless accessories that enable remote control and streaming of the sound directly to the cochlear implant. Clinical Investigations are planned when performance and/or safety evidence requirements require human use. This clinical investigation will be conducted by an internal site. Internal sites are clinical research facilities owned and operated by Cochlear. Cochlear has the following processes to mitigate the potential conflicts of interest that may arise with the use of internal sites:

- Standard Operating Procedures to manage the separation of Investigator and Sponsor activities as well as ensuring compliance with Good Clinical Practice and all applicable regulations.
- Secure separation of Investigators' trial materials and testing rooms (Audiology Suite) from Sponsor facilities and other employees. The research facility is restricted to limited personnel.
- Electronic data capture is restricted by user roles to control access to data entry/correction, source data verification, data sign off, and reporting functionalities.
- Centralised review of safety events to provide independence in oversight.
- Cochlear Investigators are qualified by education and experience in cochlear implant technology and clinical programming.
- Monitoring roles performed by individuals who are not also investigators or other delegated site personnel on the same clinical investigation.
- Joint Cochlear Site and Sponsor roles not permitted if the clinical investigation design involves double-blinding of randomised treatment or testing assignment.

Activities to be performed by sponsor representative excluding monitoring include:

1. Application of clinical quality assurance and quality control principles to the processes of the clinical investigation

    a. Implement and maintain written clinical quality procedures to ensure the clinical investigation is designed, conducted and that data generated is compliant with the ISO 14155:2011 Standard(ISO, 2011).

    b. Clinical quality assurance and quality control will be implemented according to sponsors quality system (Cochlear Quality Manual reference [7])

2. Clinical investigation planning and conduct

    a. Selection of clinical personnel for project management of the clinical investigation

    b. Preparation of documents and materials for the clinical investigation

    c. Project management for the clinical investigation. i.e. accountability of investigational devices, clinical trial insurance coverage, submission of application(s) and investigation updates to the appropriate regulatory authority(ies).

3. Safety evaluation and reporting of adverse events (AE) to the TGA and ethics committee

4. Clinical investigation close-out, statistical analyses and final report

8 RISKS AND BENEFITS OF THE INVESTIGATIONAL MEDICAL DEVICE AND CLINICAL INVESTIGATION

8.1 Anticipated Clinical Benefits

This study provides subjects with the opportunity to trial a new cochlear implant sound processor and related components (Nucleus 7) if they don't already own these features, and the new Remote Check for Android smart phones prior to the commercial release date. Subjects may benefit from improved usability and performance of the different components of the Nucleus 7 system, there is no expected benefit of using the Remote Check in the study environment.

8.2 Anticipated Adverse Device Effects

The CP1000 Sound Processor and Nucleus Smart App are approved products. Product specific warnings can be found in the CP1000 Sound Processor User Guide [8].

The Nucleus Smart app with the addition of the new tests available via the Remote Check streams audio signals via Bluetooth to the sound processor. There is a low risk that participants may hear a sound that is too loud during programming or during audio streaming [6].

8.3 Risks Associated with Participation in the Clinical Investigation

- Possible exposure to sound that is uncomfortable or loud during fitting of the sound processor or streaming from the smartphone.

- Possible interactions with concomitant medications and residual risks for the device are not anticipated in this clinical investigation.
- There is an increased risk of exposure to infectious diseases, for example COVID-19, during visits to the study site.

8.4 Risk Mitigation

- The fitting and use of the sound processor will be supervised by the investigator at the start of the study. In addition, recipients will be encouraged to inform the investigator whether the sound processor provides any physical discomfort or produces sounds that are uncomfortable. Stimulation will be immediately ceased.
- Recipients will be counselled to remove the sound processor off their head if any uncomfortable sound occurs. Subjects will have access to their own sound processors and programs during the course of the study.
- All reported ADEs and DDs will be regularly reviewed by the Sponsor's Clinical review Board for the duration of the study to facilitate early detection and appropriate intervention if events are unanticipated with respect to incidence, severity, or outcome.

It is expected that study participants will be taking steps to limit exposure to infectious diseases, for example, COVID-19. The site will actively follow the advice of official health authorities and governments to ensure the health and wellbeing of site employees and research subjects. These include but are not limited to:

- Operational changes to ensure attendance at the site is limited to only those who are required to be there. Cochlear headquarters has implemented procedures to enable contact tracing for all employees and visitors, as well as processes to scale up, scale down and/or deep clean should there be a confirmed positive case of coronavirus on the premises.
- Physical distancing restrictions are in place throughout Cochlear headquarters. The research site is also separated physically, enabling separation of study participants from other employees working in the building.
- Increased hygiene etiquette including cleaning of high-touch surfaces before and after each study visit, disinfection of any shared study devices or equipment and investigators are equipped to use gloves or wear a face mask upon request. Hygiene resources such as handwashing/rubbing stations are readily available throughout the building and research site.
- There is adequate signage to communicate onsite hygiene and access requirements throughout the building.
- Where possible, study participants will be encouraged to drive to Cochlear and utilise the free on-site parking instead of travelling via public transport.
- All visitors to Cochlear headquarters are to declare their health status via a written

declaration on arrival at the site. The declaration must state the subject is well and COVID-19 symptom free and have not been in contact with a known or suspected case of COVID-19 in the 14 days prior to access to the building.

- Subjects will be provided with any necessary resources required to return study devices to the site, should they be unable to attend any of the scheduled visits. For example, couriers or postage may be arranged as necessary.

8.5 Risk-to-Benefit Rationale

The Nucleus 7 sound processor Clinical Evaluation Report (CER) [9] states that all hazards associated with the Nucleus Smart App including Remote Check on iOS devices have been classified as having “Low” or “Medium” residual risk of harm. The CER concludes that the clinical safety (risks) and performance benefit of devices relevant to anticipated performance of the Nucleus 7 sound processor including the Remote Check functionality on iOS devices have been evaluated, and the data demonstrate that the device has a favourable safety profile and is effective. The Cochlear-Sponsored clinical investigations and systematic literature review, coupled with the design verification/validation and post-market surveillance data, establish that the benefits of the device outweigh the risks.

The Remote care system Hazards Analysis report [6] concludes that the overall risks for Remote Check on iOS or Android devices are low, with one Low residual risk and one Medium residual risks identified.

9 STATISTICAL CONSIDERATIONS

9.1 General Considerations

The summary of primary and exploratory outcome measures will be descriptive providing summary statistics reflecting the outcome measures as appropriate. Means, standard deviations, ranges will be reported for continuous variables. Numbers, percentages and totals will be reported for binary or ordinal variables. Missing data will not be imputed. Demographic and safety data will be summarised descriptively.

Pass / fail criteria: The investigator or observer will rate the participant’s ability to complete the primary tasks listed in Table 5 using the rating scale in Figure 3. If the participant is unable to complete the task (rating 1, unable to complete) in the final version of Remote Check on Android smart phones then it will be considered as a fail.

9.2 Outcome measures

9.2.1 Primary Outcome measure

Proportion of subjects who, while using the final version of Remote Check on Android smart phones, are able to complete the primary tasks.

9.2.2 Secondary Outcome measures

There is no secondary outcome measure.

9.2.3 Exploratory Outcome measures

- The test-retest difference for Aided Threshold Test (ATT) on Android smart phones
- The test-retest difference for Digit Triplet Test (DTT) on Android smart phones

9.3 Hypotheses

No formal testable hypotheses are applicable.

9.3.1 Primary Hypothesis

No formal testable hypotheses are applicable.

9.3.2 Secondary Hypothesis

No formal testable hypotheses are applicable.

9.3.3 Exploratory Hypothesis

No formal testable hypotheses are applicable.

9.4 Sample Size Determination

The primary outcome measure of this study is the proportion of subjects who, while using the final version of Remote Check on Android smart phones, are able to complete the primary tasks.

Observations will be used to determine the participant's ability to complete the tasks. Different versions of the IMD will be used in an adaptive procedure to assess the usability and to make incremental changes in the IMD. This actual use study will be conducted as per summative usability test standards.

A minimum of 15 test participants will be used for this study. As per standard HE75:2009(R2018) Human Factors Engineering – Design of Medical Devices (AAMI HE75, 2018) and Applying Human Factors and Usability Engineering to Medical Devices: Guidance for Industry and Food and Drug Administration Staff (AAMI HE75, 2016), a minimum of 15 test participants per user group is recommended for summative evaluation testing.

9.5 Analysis Populations

Full analysis set is generally recommended over per protocol set analysis for randomised controlled studies with multiple arms (Ranganathan, Pramesh, & Aggarwal, 2016) As this study does not involve randomisation and any subjects who withdraw will be replaced, per protocol set analysis is appropriate for this study. Primary and exploratory analysis will be completed with per protocol set data. If a participant withdraws after completion of the the primary outcome measure but not the exploratory outcome measure, their data will be included in the analysis. Safety analysis will be completed with the full analysis set data to ensure that all safety issues are taken into consideration.

9.6 Primary Outcome measure Analyses

Proportion of subjects who, while using the final version of Remote Check on Android smart phones, are able to complete the primary tasks as per the pass/fail criteria will be described using descriptive statistics.

9.7 Secondary Outcome measure Analyses

Not applicable for this clinical investigation

9.8 Exploratory Outcome measure Analyses

The test-retest differences for DTT and ATT on Android smart phones will be analysed using inferential statistics like paired t-tests.

9.9 Safety Analyses

For AE/ADEs and DDs, the percentage of subjects who experienced at least one occurrence of each, will be summarised. Any subjects who discontinued an intervention due to an AE/ADEs, or who experienced a severe or an SAE/SADEs will be summarised separately.

9.10 Interim Analyses

The usability observations and feedback will be analysed on an ongoing basis and these will be used to improve the product. No formal interim analysis is planned for the usability ratings.

10 INFORMED CONSENT PROCESS

The Investigator shall obtain written informed consent from the subject using an approved ICF prior to any clinical investigation-related examination or activity. The rationale of the clinical investigation, as well as the risks and benefits, what participation will involve, and alternatives to participation will be explained to the subject. Ample time will be provided for the subject to enquire about details of the clinical investigation and to decide whether to participate.

All questions about the clinical investigation shall be answered to the satisfaction of the subject or the subject's legally acceptable representative. Subjects shall not be coerced or unduly influenced to participate or to continue to participate in a clinical investigation.

Each subject (or their legally authorised representative) and the person who conducted the informed consent discussion, shall sign and date the Informed Consent Form (ICF). Where required, a witness shall sign and personally date the ICF. A copy of the signed ICF shall be given to the subject. The original signed ICF shall be archived in the Investigator's Site File or subject file at the investigational site.

The subject, or the subject's legally authorised representative, shall be informed in a timely manner if new information becomes available that may be relevant to the subject's willingness to continue participation in the clinical investigation. The communication of this information must be documented as an update to the ICF and re-consent of the subject.

11 ADVERSE EVENTS AND DEVICE DEFICIENCIES

11.1 Definitions

11.1.1 Adverse Event

An adverse event (AE) is any untoward medical occurrence, unintended disease or injury, or untoward clinical signs (including abnormal laboratory findings) in subjects, users or other persons whether related to the medical device or the procedures required for implant or use.

NOTE 1: This definition includes events related to the medical device or the comparator device.

NOTE 2: This definition includes events related to the procedures involved.

NOTE 3: For users and other persons, this definition is restricted to events related to medical devices.

11.1.2 Adverse Device Effect

An adverse device effect (ADE) is an AE related to the use of a medical device.

NOTE 1: This includes any AE resulting from insufficiencies or inadequacies in the instructions for use, the deployment, the implantation, the installation, the operation, or any malfunction of the medical device.

NOTE 2: This definition includes any event resulting from use error or from intentional misuse of the medical device.

11.1.3 Serious Adverse Event

A serious adverse event (SAE) is any AE that:

a) led to a death,

b) led to a serious deterioration in the health of the subject that either resulted in:

- a life-threatening illness or injury, or
- a permanent impairment of, or damage to, a body structure or a body function, or
- in-patient hospitalisation or prolonged hospitalisation, or
- medical or surgical intervention to prevent life-threatening illness or injury or permanent impairment or damage to a body structure or a body function, or
- Chronic disease.

c) led to foetal distress, foetal death or a congenital physical or mental abnormality, or birth defect

NOTE: Planned hospitalisation for a pre-existing condition, or a procedure required by the CIP, without serious deterioration in health, is not considered a SAE.

11.1.4 Serious Adverse Device Effect

A serious adverse device effect (SADE) is an ADE that has resulted in any of the consequences characteristic of a SAE.

11.1.5 Unanticipated Serious Adverse Device Effect

An unanticipated serious adverse device effect (USADE) is a SADE, which by its nature, incidence, severity, or outcome has not been identified in the current version of the hazards analysis [6].

NOTE: An anticipated serious adverse device effect is an effect, which by its nature, incidence, severity, or outcome has been identified in the hazards analysis [6].

11.1.6 Adverse Events of Special Interest

Not applicable for the current clinical investigation.

11.1.7 Device Deficiency

A Device Deficiency (DD) is an inadequacy of a medical device with respect to its identity, quality, durability, reliability, safety, or performance.

NOTE: Device Deficiencies include malfunctions, use errors, and inadequate labelling or information supplied by the manufacturer.

11.2 Recording and Handling of Adverse Events

Subjects shall be carefully monitored during the clinical investigation and the investigator should enquire about AEs at investigation visits.

All *AEs.* will be recorded from the time of first use of the IMD. AE recording will continue for each subject until completion of their End of Study visit. Ongoing SAEs and SADEs will be followed for 30 days, or until resolution or stabilisation of the event, whichever comes first.

Source notes should indicate the evaluation for AEs, even if none to report. All required AEs will be reported if observed, even if anticipated and/or acknowledged as a risk factor in the consent.

All AEs will have the following information documented: start and stop dates, action taken, outcome, severity and investigators opinion on the potential relationship to the IMD and study procedures. If an AE changes in severity, the most severe (highest) grade will be captured for that event on the Adverse Events CRF.

11.2.1 Assessment of Severity

The Principal Investigator (or qualified delegate) will make an assessment of severity for each event based on clinical judgement. The intensity of each event recorded in the CRF should be assigned to one of the following categories:

Mild	An event that is easily tolerated by the subject, causing minimal discomfort and not interfering with everyday activities.
Moderate	An event that is sufficiently discomforting to interfere with normal activities
Severe	An event which is incapacitating and prevents normal everyday activities

11.2.2 Assessment of Causality

The Investigator will assess the potential causal relationship of each event, using clinical judgement. Alternative causes, such as natural history of underlying diseases, other risk factors and the temporal relationship of the event to the IMD product will be considered and investigated. The causal relationship to the IMD is to be assessed by the Investigator (or medically qualified delegate) and should be assessed using the following classifications:

Not related	Relationship to the medical device or procedures can be excluded when: • the event is not a known side effect of the product category the device belongs to or of similar devices and procedures; • the event has no temporal relationship with the use of the device or the procedures; • the event does not follow a known response pattern to the medical device (if the response pattern is previously known) and is biologically implausible; • the discontinuation of medical device application or the reduction of the level of activation/exposure - when clinically feasible - and reintroduction of its use (or increase of the level of activation/exposure), do not impact on the event; • the event involves a body-site or an organ not expected to be affected by the device or procedure; • the event can be attributed to another cause (e.g. an underlying or concurrent illness/ clinical condition, an effect of another device, drug, treatment or other risk factors); • the event does not depend on a false result given by the investigational medical device used for diagnosis, when applicable; • harms to the subject are not clearly due to use error; In order to establish the non-relatedness, not all the criteria listed above might be met at the same time, depending on the type of device/procedures and the event.
Unlikely related	The relationship with the use of the medical device seems not relevant and/or the event can be reasonably explained by another cause, but additional information may be obtained.
Possibly related	The relationship with the use of the medical device is weak but cannot be ruled out completely. Alternative causes are also possible (e.g., an underlying or concurrent illness/ clinical condition or/and an effect of another device, drug or treatment). Cases where relatedness cannot be assessed, or no information has been obtained should also be classified as possibly related.
Probably related	The relationship with the use of the medical device seems relevant and/or the event cannot be reasonably explained by another cause, but additional information may be obtained.

Definitely related	The event is associated with the medical device or with procedures beyond reasonable doubt when: • the event is a known side effect of the product category the device belongs to or of similar devices and procedures; • the event has a temporal relationship with the medical device use/application or procedures; • the event involves a body-site or organ that – the medical device or procedures are applied to – the medical device or procedures have an effect on; • the event follows a known response pattern to the medical device (if the response pattern is previously known); • the discontinuation of medical device application (or reduction of the level of activation/exposure) and reintroduction of its use (or increase of the level of activation/exposure), impact on the event (when clinically feasible); • other possible causes (e.g., an underlying or concurrent illness/ clinical condition or/and an effect of another device, drug or treatment) have been adequately ruled out; • harm to the subject is due to error in use; • the event depends on a false result given by the medical device used for diagnosis, when applicable; In order to establish the relatedness, not all the criteria listed above might be met at the same time, depending on the type of device/procedures and the event.

11.2.3 Assessment of Seriousness

The Investigator will assess the seriousness of each event according to clinical judgement and the definition provided in section 11.1.3.

11.2.4 Assessment of Expectedness

An event should be considered unanticipated if the nature, severity, or frequency of that event is not consistent with the applicable safety reference information, such as the risk analysis report, hazards analysis, IB, or Product Information/IFU if the product is approved for marketing.

For this clinical investigation the listed items in Section 8.2 and 8.3 of this CIP are anticipated ADEs.

Anticipated	An adverse device effect (ADE) which by its nature, incidence, severity, or outcome is consistent with the applicable safety reference information (e.g., IB, IFU).
Unanticipated	An adverse device effect (ADE) which by its nature, incidence, severity, or outcome is not consistent with, or has not been identified in the applicable safety reference information (e.g., IB, IFU).

11.3 Recording and Handling of Device Deficiencies

Subjects shall be carefully monitored during the clinical investigation and routinely questioned about DDs at investigation visits. Source notes should indicate the evaluation for DDs, even if none to report.

The Investigator shall assess if the DD led to an AE or could have led to a serious medical occurrence (serious adverse device effect) if;

a) suitable action had not been taken,

b) intervention had not been made, or,

c) circumstances had been less fortunate

All DDs will be documented in the source notes and the DD page of the CRF.

11.4 Reporting Responsibilities

The Investigator is responsible for reporting all AEs and DDs in the CRF.

11.4.1 Investigator Reporting of Serious Adverse Events

All AEs meeting the criteria for an SAE, or DD that could have led to an SADE, must be reported to the Sponsor by five working days.

Reporting is achieved through completion of the events details in the Adverse Event page of the eCRF

The Investigator shall always provide an assessment of causality at the time of the initial report, as described in section 11.2.2 ‘Assessment of Causality’. If data obtained after reporting indicates that the assessment of causality is incorrect, then the SAE form may be appropriately amended, signed, dated, and resubmitted to the Sponsor.

If the Investigator does not have all other information regarding an SAE, he/she will not wait to receive additional information before reporting the event. The reporting forms shall be updated when additional information is received.

The Investigator is responsible for reporting of safety events to their local EC using the applicable report form, in accordance with local regulations.

11.4.2 Sponsor Notification of Events

The Sponsor is responsible for reviewing all safety data to evaluate potential causality and anticipation of all ADEs.

The Sponsor is also responsible for reporting all reportable events according to the requirements and timelines of the regulatory authorities relevant to this clinical investigation, and shall conduct an expedited assessment of all SAEs, unanticipated ADEs, DDs that could have led to an SADE.

The Safety Monitor for AE/DD assessment and any AE/DD related queries is:

Name of contact person of the Sponsor:	[redacted]
Country and time zone:	Australia, Australian Eastern Standard Time
Phone number:	[redacted]
Email:	[redacted]

11.5 Independent Data Monitoring Committee

The decision of whether to establish a Data Monitoring Committee (DMC) is guided by the risk analysis, considering both the risks associated with the use of the investigational device and the risks associated with subject's participation in the clinical investigation.

The risks associated with the use of the investigational device and the subject's participation in the clinical investigation is described in Section 8 of this document. The subjects in the proposed clinical investigation will be able to revert to their own processor if there are sound quality issues or dissatisfaction with the CP1000 sound processor. As a result, no Data Monitoring Committee (DMC) has been established for this clinical investigation.

12 Device Accountability

Supply of investigational medical devices will be recorded using the Sponsor Device Tracking Form (1295388) and Software Tracking Form (1302326) by the sponsor representative. Investigational medical device(s) will be quarantined at the investigational site and clearly labelled to identify exclusively for use in a clinical investigation.

Subject level device supply will be tracked using the Sponsor's Individual Subject Accountability Log Form (1295295) by the principal investigator.

All device(s) that have been identified with Device Deficiencies will be returned to Device Analysis for analysis and archiving.

Contact information regarding the IMD is provided below.

Name of contact person of the Sponsor:	[redacted]
Country and time zone:	Australia, Australian Eastern Standard Time
Phone number:	[redacted]
Email:	[redacted]

13 Deviations from the Clinical Investigation Plan

The Investigator(s) must not deviate from the CIP, except in case of an emergency to protect the safety and well-being of the subject(s). Such deviations will be documented by the site personnel in the source documentation for the subject and reported to the relevant EC as per institutional requirements and to the Sponsor as soon as possible, but not later than five working days from the date of the emergency.

If there is a deviation from CIP-defined assessments or parts thereof are omitted or completed incorrectly, the deviation will also be documented by the site personnel in the source documentation for the subject. Depending on the type or severity of the deviation the Investigator may be required to notify the EC, particularly if the deviation potentially impacts subject safety, performance of IMD, or data integrity.

All CIP deviations will be documented in the eCRF to enable analysis and reporting by the Sponsor in the Clinical Investigation Report (CIR), or to the relevant regulatory authority(s), if applicable.

Gross misconduct on behalf of an Investigator, such as intentional non-compliance with CIP or GCP requirements or fraud, will result in disqualification of the Principal Investigator and/or Investigational Site from participation in the investigation. Data provided by the Principal Investigator or Investigational Site will be excluded from the per-protocol analysis group.

14 DATA MANAGEMENT

The CRF will capture subject status according to the following criteria:

- Consented: Signed consent and eligibility evaluations underway
- Screen Fail: Subject determined not to be eligible to proceed for participation
- Enrolled: First use of the IMD following completion of screening activities and confirmation of eligibility
- Withdrawn: Enrolled subjects who withdraw or are withdrawn by the Investigator or Sponsor before the expected End of Study visit. Withdrawn subjects may still continue in safety follow up until their scheduled End of Study visit, for reasons described in section 7.2.6.
- Complete: Enrolled subjects who complete the planned follow up schedule and End of Study visit.

Source data will be captured in clinic notes, paper-based source data worksheets, or printed directly from testing software. If electronic medical records do not permit read only access for monitoring purposes, a verified printout must be provided.

Data collection for demographics, medical history, adverse events, device deficiencies, protocol deviations and completion will be performed using Medidata Rave for electronic data capture (EDC) on electronic Case Report Forms (Medidata Safety eCRF), to support safety analysis and reporting. All other data will be collected from clinical fitting software, and captured into Nucleus Smart App. Unamended data files shall be regarded as the source.

Site personnel will be trained on the completion of the Medidata Safety eCRF prior to obtaining access to the system, and will have their own Login/Password. Access to clinical study information will be based on an individual's role and responsibilities.

Medidata Rave uses role-based user permissions for data entry, viewing, and reporting options. All communications between users and the EDC server are encrypted. Web servers are protected by a managed firewall. This application is designed to be in compliance with applicable regulations including 21 CFR Part 11.

The application will include programmed data consistency checks and supports manual generation of data clarifications/queries, including documentation of site responses. The application maintains a comprehensive audit trail for all data entered, including updates and queries, and documents the time that each entry occurred and who made the entry.

Principal Investigators will affirm that the data for each subject at their site is accurate and complete by way of an electronic signature.

15 CONFIDENTIALITY

The investigator and site staff will collect and process personal data of the subjects in accordance with governing data privacy regulations.

Data will be reported to the Sponsor on CRFs or related documents (for example, questionnaires). Subjects will be identified on CRFs and other related documents only by a unique subject identification code and shall not include the subject's name or other personal identifiable information. Completed CRFs or related documents are confidential and will only be available to the Investigator and site staff, the Sponsor and their representatives, and if requested to the Ethics Committee and national regulatory authorities. Publications or submission to a regulatory authority shall not disclose the identity of any subject.

16 ETHICS COMMITTEE AND REGULATORY AUTHORITY APPROVAL

The clinical investigation will not commence prior to the written favourable opinion or approval from the EC and or regulatory authority (if appropriate) is obtained.

The final Sponsor-approved version of the CIP, Informed Consent Form, and other necessary documents shall be submitted to the EC. A copy of the EC opinion/approval shall be provided to the Sponsor.

The Investigator shall forward to the Sponsor, for review and approval, any amendment made to the approved ICF and any other written information to be provided to the subject prior to submission to the EC.

The Sponsor and Principal Investigator will continue communications with the EC, as required by national regulations, the clinical investigational plan, or the responsible regulatory authority.

Any additional requirements imposed by the EC or regulatory authority will be implemented by the Sponsor.

The Investigator shall submit the appropriate documentation if any extension or renewal of the EC approval is required. In particular, substantial amendments to the CIP, the ICF, or other written information provided to subjects will be approved in writing by the EC.

The Investigator shall report to the EC any new information that may affect the safety of the subjects or the conduct of the clinical investigation. The Investigator will send written status summaries of the investigation to the EC regularly, as per local EC requirements.

Upon completion of the clinical investigation, the Investigator shall provide the EC with a brief report of the outcome of the clinical investigation, as per local EC requirements.

The clinical investigation is covered by clinical trial insurance, meeting the requirements of the participating countries.

17 SUSPENSION OR PREMATURE TERMINATION

The Sponsor will discontinue the clinical investigation site if:

1) major non-adherence to the CIP or GCP principles is occurring
2) it is anticipated that the subject recruitment will not be adequate to meet the objectives of the clinical investigation

An ongoing clinical investigation may be discontinued in case of:

1) device failure
2) serious or intolerable ADE, leading to the explant or discontinued use of the device
3) subject's death

18 AMENDMENTS TO THE CLINICAL INVESTIGATION PLAN

No changes in the CIP or investigation procedures shall be made without mutual agreement of the Principal Investigator and the Sponsor. This agreement will be documented as a CIP amendment. Amendments will require notification to the Ethics Committees (ECs) by the Principal Investigators (and to the relevant regulatory authority(s) by the Sponsor, if applicable).

19 RECORD KEEPING AND RETENTION

Data generated from the clinical investigation will be stored in a limited-access file area and be accessible only to representatives of the study site, the Sponsor and its representatives, and relevant health authorities/regulatory agencies. All reports and communications relating to study subjects will identify subjects only by subject unique identification code. Complete subject identification will be maintained by the Investigator. This information will be treated with strict adherence to professional standards of confidentiality.

The investigator must retain study-related records for a period of at least 15 years after completion of the investigation or after the last device was placed on the market, if the IMD has market authorisation.

The Sponsor will notify the Principal Investigator when records are no longer needed. The Investigator will not discard any records without notifying the Sponsor. If the Principal Investigator moves from the current investigational site, the Sponsor should be notified of the name of the person who will assume responsibility for maintenance of the records at the investigational site or the new address at which the records will be stored. The Investigator will notify the Sponsor as soon as possible in the event of accidental loss or destruction of any study documentation.

20 PUBLICATION POLICY

This clinical investigation will be prospectively registered at a public clinical trial registry Australian New Zealand Clinical Trials Registry (ANZCTR).

A joint peer-reviewed publication authored by the clinical investigator(s) and Sponsor will be prepared. In addition, the results of the clinical investigation may also be disseminated as conference presentations (e.g., abstract and poster session). Manuscript authorship and responsibilities will be discussed and agreed upon prior to investigation start and in accordance with guidelines and recommendations provided by the International Committee of Medical Journal Editors (ICMJE) to enable communication in a timely manner. All contributors who do not meet the criteria for authorship will be listed in an acknowledgments section of the publication.

21 STATEMENTS OF COMPLIANCE

This clinical investigation shall be conducted in accordance with ethical principles that have their origin in the Declaration of Helsinki (World Medical Association, 2013), International Standard ISO 14155 Clinical investigation of medical devices for human subjects - Good Clinical Practice, and any regional or national regulations, as applicable.

22 QUALITY CONTROL AND ASSURANCE

In accordance with Cochlear's Quality Management System, all clinical investigations shall be conducted according to internationally recognised ethical principles for the purposes of obtaining clinical safety and performance data about medical devices.

The Sponsor employees (or designee) shall use standard operating procedures (SOP) to ensure that clinical study procedures and documentation are consistently conducted and compliant with the ISO 14155 Standard, Good Clinical Practice (GCP), and applicable local regulations.

22.1 Monitoring

The Sponsor will perform on-site and remote monitoring visits as frequently as necessary to oversee conduct, data collection and record keeping by sites. The clinical investigation monitoring plan is a separate document describing all the activities performed during site initiation, monitoring, and close out.

22.2 Audits

An Investigator must, in reasonable time, upon request from a relevant health authority or regulatory agency, permit access to requested records and reports, and copy and verify any records or reports made by the Investigator. Upon notification of a visit by a regulatory authority, the Investigator will contact the Sponsor or its designee immediately.

The Investigator will grant the Sponsor representatives the same access privileges offered to relevant health authority or regulatory agents, officers, and employees.

23 TRADEMARKS AND COPYRIGHT

24 REFERENCES

24.1 Internal References

ID	Document Title	Number
[1].	Product Risk Management Procedure	1143376
[2].	Recipient App Android Version 200300 Release Report	D1752281
[3].	Device Tracking Form	1295388
[4].	Software Tracking form	1302326
[5].	Individual Subject Device Accountability Log Form	1295295
[6].	Remote care system Hazards Analysis report	D1366475
[7].	Cochlear Limited Quality manual	1141823
[8].	CP1000 SP User Guide ENGLISH	592753
[9].	The Nucleus 7 sound processor Clinical Evaluation Report	556314

24.2 External References

AAMI HE75. (2016). *Applying Human Factors and Usability Engineering to Medical Devices Guidance for Industry and Food and Drug Administration Staff*. (301).

AAMI HE75. (2018). *Human Factors Engineering – Design of Medical Devices* (Vol. 2009).

Cochlear Ltd. (2020). *Nucleus Smart App User Guide Remote Check iOS (D1473171)*.

Howe, S., & Mawman, D. (2015). Audit of adult post-implant annual reviews and evaluation of patient-led review. *Cochlear Implants International*, *16*(1), 3–8. https://doi.org/10.1179/1754762814Y.0000000079

ISO. (2011). *Clinical investigation of medical devices for human subjects — Good clinical practice. 14155*.

Müller, J., & Raine, C. H. (2013, June). Quality standards for adult cochlear implantation. *Cochlear Implants International*, pp. 6–12. https://doi.org/10.1179/1467010013Z.00000000097

Ranganathan, P., Pramesh, C., & Aggarwal, R. (2016). Common pitfalls in statistical analysis: Intention-to-treat versus per-protocol analysis. *Perspectives in Clinical Research*, *7*(3), 144. https://doi.org/10.4103/2229-3485.184823

Warren, C. D., Nel, E., & Boyd, P. J. (2019). Controlled comparative clinical trial of hearing benefit outcomes for users of the Cochlear™ Nucleus ® 7 Sound Processor with mobile connectivity. *Cochlear Implants International*, *20*(3), 116–126. https://doi.org/10.1080/14670100.2019.1572984

World Medical Association. (2013). World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA*, *310*(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

25 CHANGE HISTORY

Version	Change	Rationale
1	Introduction of the document	N/A
2	Correction of enrolment period from 8 months to 2 months. Addition of N24 cochlear implants to inclusion criteria. Addition of screenshots for different tests in Remote Check. Addition of joint sponsor and site information to section 7.6.	Error noted during quality check. Information omitted in version 1.0. EC request. EC request.