**Official Title:** A pivotal, prospective, single-centre, randomized test order, crossover, open label study comparing the performance of a new sound processor - Baha 6 Max with unaided hearing and Baha 5 in adult subjects with conductive or mixed hearing loss.

**NCT Number**: NCT04559282

**Document Date**: 03 March 2021

# Statistical Analysis Plan

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|---|---|
| **Clinical Investigation Plan (CIP) Title:** | **A pivotal, prospective, single-centre, randomized test order, crossover, open label study comparing the performance of a new sound processor - Baha 6 Max with unaided hearing and Baha 5 in adult subjects with conductive or mixed hearing loss.** |
| **CIP Number:** | CBAS5779 |
| **CIP version:** | Version 3.0 18-AUG-2020 |
| **Clinical Program Manager (CProM):** | [redacted] |

## Contents

# 1 INTRODUCTION

This document is a companion document to the Clinical Investigation Plan (CIP). It includes a comprehensive description of the intended statistical analyses to be performed and the presentation of the results and data collected for the study.

This Statistical Analysis Plan (SAP) is based upon final CIP version 3.0

Any deviation from the Statistical Analysis Plan will be reported in the Clinical Investigation Report (CIR).

# 2 STUDY POPULATION

The subjects include men and women aged 18 or older who are currently using the Baha Connect System (percutaneous Baha). Subjects will be screened, and 16 eligible subjects will be enrolled in the clinical investigation.

# 3 STUDY ENDPOINTS

## 3.1 Endpoints to be used for the primary objectives

- First primary objective: Adaptive speech in noise [signal-to-noise ratio, 50% speech understanding]
- Second primary objective: Preference of device.

## 3.2 Endpoints to be used for the secondary objectives

- Daily use of sound processors (hours) from Diary, Only Baha 6 Max SP vs Baha 5 SP
- Change of battery from Diary, Only Baha 6 Max SP vs Baha 5 SP
- Switch to their own sound processor and the reason for change from Diary (Only Baha 6 Max SP vs Baha 5 SP)
- Adaptive speech in noise [signal-to-noise ratio, 50% speech understanding] Baha 6 Max SP and Baha 5 SP
- Thresholds audiometry, sound-field [0.25, 0.5, 1.0, 2.0, 3.0, 4.0, 6.0, 8.0 9.0 and 10.0 kHz]
- Speech in quiet [% correctly perceived words at 65dB SPL]
- Evaluation of sound quality and listening effort through sound clips. Only Baha 6 Max SP and Baha 5 SP.

# 4 STATISTICS

## 4.1 Sample Size

In order to meet the sample sizes calculations for both primary analyses, 16 subjects will be included.

As this is an internal Cochlear investigation, patients will be recruited until the number of required patients are enrolled. Hence, no dropouts are expected.

First primary analysis: Baha 6 Max SP vs unaided regard Adaptive speech in noise

From the CIP: Assuming an individual mean difference (aided Baha 6 Max SP minus unaided) in speech recognition in noise of 16 dB SNR with a standard deviation (SD) of 12.5 (Busch et al, 2015),

a total sample of 15 eligible subjects are required to provide 90% power to reject the null hypothesis for the statistical test for the primary objective (change in dB SNR) using a two sided, alpha 0.0050, with Two-sided Fisher's non-parametric permutation test for paired observations.

## 4.2 Analyses

### 4.2.1 Pass/Fail Criteria

If the signal-to-noise-ratio for a subject is at least 50% regarding speech understanding the subject will be classified as a responder. The primary objective of the study is that the null-hypothesis that the proportion of responders for the Baha 6 Max SP and the Baha 5 SP are equal.

If the two-sided p-value when testing the hypothesis above is below 5% the results of the study are considered successful.

This means that the pass/fail criteria for each subject is speech understanding and the pass-criteria is that the signal-to-noise-ratio for a subject is at least 50%.

### 4.2.2 Primary Hypothesis

The first primary efficacy objective is the comparison regarding adaptive speech in noise. If the signal-to-noise-ratio for a subject is at least 50% regarding speech understanding the subject will be classified as a responder. The null-hypothesis that the proportion of responders for the Baha 6 Max SP and the Baha 5 SP are equal will be tested using the Binomial test.

The second primary efficacy analysis is to test the null-hypothesis that the proportion of subjects who prefer Baha 6 Max SP and the proportion of subjects who prefer Baha 5 SP are equal will be tested using the Binomial test.

### 4.2.3 Secondary Hypotheses

For continous variables and ordered categorical variables the Wilcoxon signed rank test will be applied and for binary variables the Binomial test will be applied when testing the null-hypothesis that the Baha 6 Max SP and the Baha 5 SP are equal.

## 4.3 Analysis Datasets

### 4.3.1 Intent-to-Treat

The Full Analysis Set will consist of all correctly included and randomized subjects that have at least one measurement on two of the periods Baha 6 Max SP Baha 5 SP.

### 4.3.2 Per Protocol Dataset

The Per Protocol Analysis Set (PPAS) will consist of all subjects included in the FAS who have measurements on all primary and secondary variables on all three periods and have no major protocol violations.

## 4.4 Additional Statistical Considerations

### 4.4.1 Missing, Unused or Spurious Data

No imputation of missing data will be performed, i.e. an observed case approach will be used in the statistical analyses.

### 4.4.2 Planned Interim Analysis

Not applicable.

### 4.4.3 Criteria for Termination of the Clinical Investigation

Not applicable.

### 4.4.4 Additional Statistical Analyses

No additional analysis will be conducted.

## 4.5 Conduct of Statistical Analysis

Responsible for most of the statistical analyses will be [redacted]
Software for the statistical analyses will be Excel (Microsoft Office Home and Business 2016)), Stata (Version 16.0) and StatXact (Version 11.1.0)

## 4.6 Quality Control on Statistical Analysis

[redacted] Principle research Audiologist.

## 4.7 Presentation of Data

Listing of all subject data will be done and presented in the statistical report.

# 5 REFERENCES

## 5.1 Internal References

| ID | Document Title | Number |
|---|---|---|
| | CBAS5779 CIP Baha 6 Max | D1716168 |
| | | |

## 5.2 External References

| ID | Document Title | Number |
|---|---|---|
| | | |
| | | |

# 6 CHANGE HISTORY

| Version | Change | Author | Date |
|---|---|---|---|
| 1.0 | Original SAP from StatCons released 22-Oct-2020. This version is an integration into Cochlear SAP template. | [redacted] | 3-Mar-2021 |
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# 7 DEFINITIONS

| Term | Description |
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