



# European Multicenter Evaluation of the Naída EAS: Feedback From CI Users and Professionals

Naída Electric Acoustic Solution

## Introduction

While several years ago, cochlear implants (CIs) were only provided to candidates with severe-to-profound hearing loss, the expansion of indication criteria now allows the implantation of candidates with aidable residual hearing in both ears. In addition, with the improvement of surgical techniques and development of atraumatic electrodes, it is possible to preserve residual hearing in the implanted ear. Acoustic stimulation of the residual hearing in combination with electric stimulation via the electrode has been shown to provide substantial benefits (see Incerti et al., 2013 for a review). The combination of a CI sound processor and acoustic amplification within the same device, allowing easy access to both electric and acoustic stimulation in the same ear, is referred to as electroacoustic stimulation (EAS).

The Naída Electric Acoustic solution, the Naída CI Q90 sound processor combined with the Acoustic Earhook, can be fitted to any CI recipient with aidable residual hearing in the implanted ear. To evaluate subjective satisfaction with the Naída Electric Acoustic solution, a comprehensive survey was conducted in a total of eleven European CI centers. Responses from CI users were collected from eight centers. Audiologists from seven centers provided responses regarding satisfaction with the Naída Electric Acoustic Solution from the professional perspective.

a. In general using the Naída CI Q90 sound processor is easy

N/A <input type="checkbox"/>	Strongly Disagree		Neutral				Strongly Agree			
	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fig. 1: Example layout of the questions provided to CI users and professionals. Each item was phrased as a statement and respondents were asked to indicate their level of agreement, where 1 indicates strong disagreement and 10 indicates strong agreement.

## STUDY METHODS

### Study Participants

- CI users**  
 A total of 15 EAS users participated in this study, nine of them were existing CI users, while six of the participants were new CI users. Eight of the existing CI users were upgraded from the Naída CI Q70 processor, one from the Naída CI Q90. Eight participants used the Naída Q90 Electric Acoustic Solution in the left ear, six in the right ear, and one subject used it bilaterally. The study population had a mean age of 56 ± 16 years (range 21-81). At the time of the survey, participants had 35 ± 34 weeks (range 6-124) of experience with the Naída Electric Acoustic Solution. Before implantation, all subjects had used hearing aids (HAs) in the implanted ear, most of them (N=12) for more than five years, only two subjects for less than one year.
- Professionals**  
 Seven professionals, all audiologists, completed the survey. Four of them indicated high familiarity with the fitting of EAS devices while the remaining three fitted EAS devices only occasionally. At the time of the survey, two of the audiologists had fitted between four and nine Naída Electric Acoustic Solution, the remaining five audiologists had fitted less than three.

### Procedures

- CI users**  
 CI users were asked to provide feedback about their experience with the Naída Electric Acoustic Solution and previous HA experience. They were asked questions about their satisfaction with several aspects of the device. All questions were phrased as statements and subjects had to indicate their level of agreement on a scale of 1 to 10. Additionally, ratings comparing the Naída Electric Acoustic Solution to their previous hearing device (CI or HA) were collected.
- Professionals**  
 Professionals were asked to provide feedback about their general experience fitting electroacoustic devices. They were asked to rate their agreement to statements about several aspects of fitting the Naída Electric Acoustic Solution on a scale of 1 to 10. They were asked to indicate which SoundWave features they found to be useful.

# CI User Survey Results

Newly implanted as well as upgraded CI users with usable residual hearing were satisfied with the Naída Electric Acoustic Solution. All survey respondents considered the Naída Electric Acoustic solution a good product and would recommend it to others. Most aspects of everyday care and maintenance of the device were also rated as satisfactory by most subjects. Three of the 15 subjects indicated some discomfort when wearing the dome in the ear canal. In these cases, a custom SlimTip can be provided to increase wearing comfort.

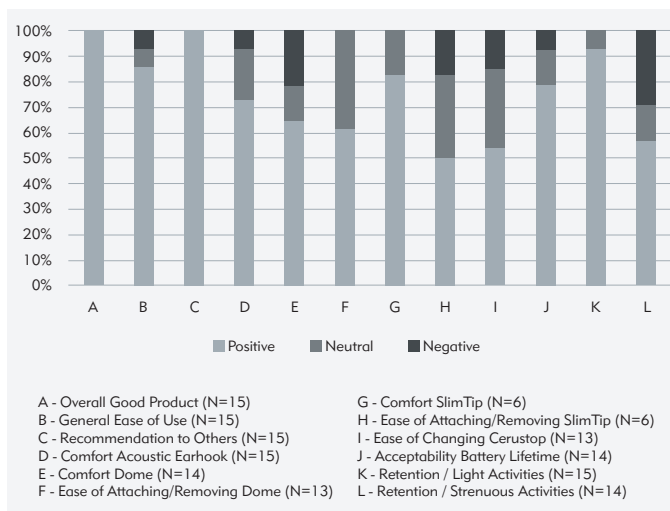


Fig. 2: CI subjective satisfaction ratings of several aspects of the Naída Electric Acoustic solution.

Compared to the previously used hearing device, sound quality was rated similar or better by most CI users. Nine of the 15 respondents compared the Naída Electric Acoustic Solution to their Naída CI Q70 or Naída CI Q90 sound processor, and five respondents compared it to various HA models.

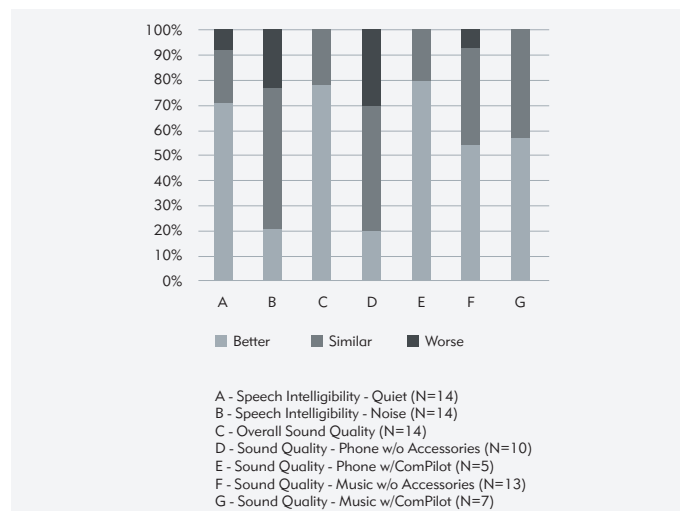


Fig. 3: Subjective sound quality ratings of the Naída Electric Acoustic Solution in comparison to the previously used hearing instrument

Several aspects of the Naída Electric Acoustic Solution everyday usability were rated as similar or better than their previously used hearing device. Since the majority of subjects compared the Naída Electric Acoustic Solution to Naída CI Q70 and Q90 processors, the subjects' responses reflect the identical hardware between both systems with a considerable number of similar ratings.

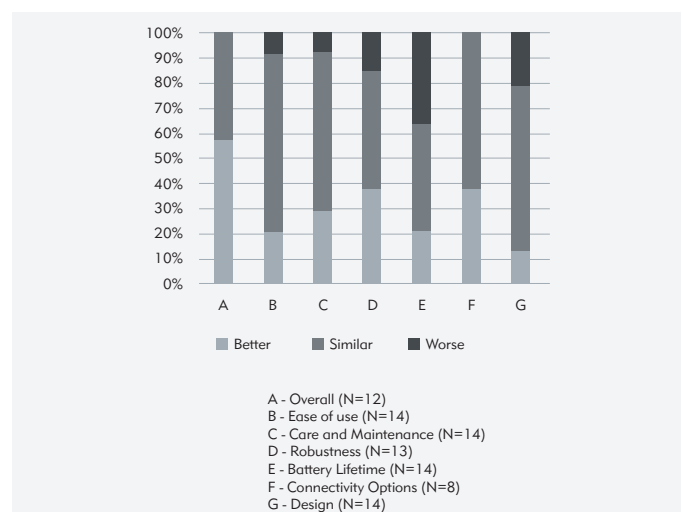


Fig. 4: Subjective usability ratings of the Naída Electric Acoustic Solution in comparison to the previously used hearing instrument

## Professional Survey Results

The dedicated AB-Phonak fitting formula was appreciated by CI audiologists. Of the seven professionals who completed the survey, five indicated *always* using the AB-Phonak fitting formula when fitting Naída Electric Acoustic Solution and the remaining two indicated that they *sometimes* used the AB-Phonak fitting formula. Default parameter settings were *always* altered by two professionals and *sometimes* by the remaining five audiologists, with the most frequent adjustment being changes to the cutoff frequency between electric and acoustic stimulation.

CI audiologists rated SoundWave Acoustic Mode fitting parameters as useful. More than half of the surveyed professionals thought of all four Acoustic Mode features as useful: the AB-Phonak fitting formula, the availability of other fitting prescriptions, the flexibility to set electric and acoustic cutoff frequencies independently, and the ability to set the volume control independently for the acoustic and electric stimulation. All but one professional considered the flexibility in setting the cutoff frequency useful and the independent volume control setting was appreciated by all professionals.

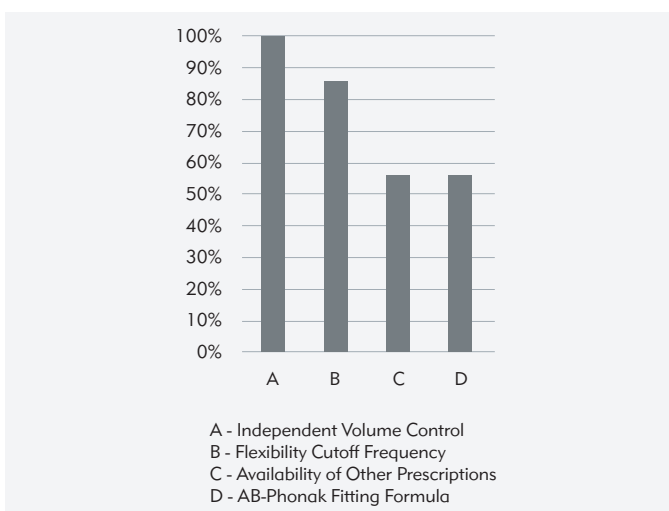


Fig. 5: Percentage of CI professionals who indicated a specific fitting feature of the Naída Electric Acoustic Solution to be useful.

## Conclusions

The Naída Electric Acoustic Solution is recognized by CI users and professionals alike as a good solution for CI users with aidable residual hearing in the implanted ear. Compared to their previously used hearing instrument (hearing aid or cochlear implant), sound quality and speech intelligibility were rated similar or better by CI users. The flexibility in fitting the Naída Electric Acoustic Solution is appreciated by CI audiologists.

### REFERENCES

1. Incerti PV, Ching TY, Cowan R. (2013) A systematic review of electric-acoustic stimulation: device fitting ranges, outcomes, and clinical fitting practices. *Trends Amplif.* 17(1):3-26. doi: 10.1177/1084713813480857

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