

NEW EARWIRE DESIGN IMPROVES THE FIT FOR RECEIVER IN THE CANAL

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INTRODUCTION

Receiver and ear wire retention can be an issue for instant fit receiver in the canal (RIC) instruments. While a custom ear mold will more likely hold the receiver in place more securely, an instant fit tip may not be secure enough to hold the receiver in place and lateral migration may occur (see figure 1). As a result, the user may need to push the receiver back into the ear canal several times during the course of the day. This also may result in a cosmetic gap between the ear wire and the side of the user's head (see figure 2). While the receiver is out of position, there may be more feedback and audibility issues.



Figure 1: The picture on the left shows a side view of the receiver laterally migrating out of the ear; the picture on the right shows proper stability. Figure 2: The picture on the left shows a front view of a cosmetic gap; the picture on the right shows a proper fit.

Robert Sweetow, Ph.D., conducted a survey of 232 hearing health professionals to determine the prevalence of lateral migration and cosmetic gaps among their patients who had been fitted with RIC hearing aids. The average clinician reported lateral migration in 20-29% of their RIC wearers and cosmetic gaps in 30-39% of their RIC wearers (see figure 3).

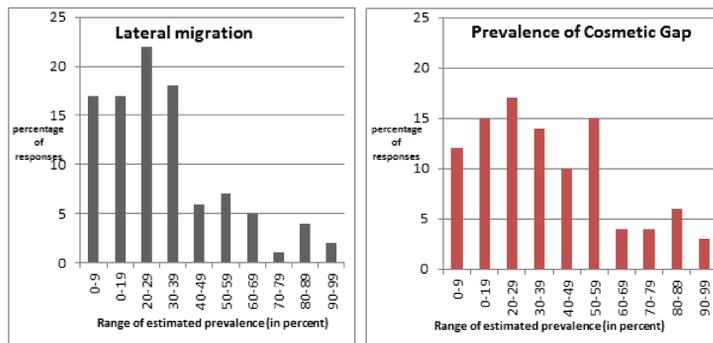


Figure 3: Prevalence of lateral migration (left) and cosmetic gaps (right) as reported by survey respondents. The range of estimated prevalence (in percent) is shown in the X-axis and Percentage of responses are shown in the Y-axis.

New Ear Wire Design

A new receiver/ear wire combination (Widex Easywear) has been created to address this issue with instant fit tips (see figure 4). The wire and receiver have been sealed together to improve resistance to moisture. The wire exits the housing from the side instead of the back of the receiver housing.



Figure 4: The standard Widex ear wire is shown on the left. The new Widex Easywear ear wire is shown on the right.

New Ear Wire Design

The wire has been reshaped in order to promote better retention in the ear canal without the use of an anchor (see figure 5). The more secure fitting will promote more consistent use for the wearer and less aggravation by having to repeatedly push the receiver back into the canal. The overall length required for the wire is also reduced due to the new shape. A multisite study was conducted to determine whether there is an improvement (less lateral migration, fewer cosmetic gaps) with the new Widex Easywear RIC ear wire compared with a standard RIC ear wire.

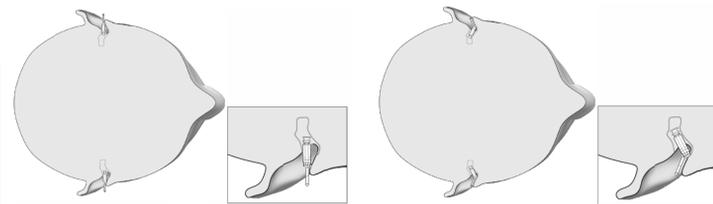


Figure 5: Ear wire fit within the ear canal. The standard ear wire is shown on the left, the new Widex Easywear ear wire is shown on the right. The Easywear ear wire conforms more closely to the shape of most ear canals.

Methods

Subjects

34 adult hearing aid users, who reported lateral migration or cosmetic gaps during their clinical care, participated in this study. The subjects were divided into two groups: Group 1 consisted of 22 current Widex RIC users; Group 2 consisted of 12 non-Widex RIC users. Both groups were equivalent in terms of mean age (70.0 and 72.4) and years of hearing aid experience (4.0 and 3.8)

Patient Evaluation

Current Widex RIC users (Group 1) and non-Widex RIC users (Group 2) were asked to evaluate their own RIC hearing aids for three days. The subjects were given a survey to evaluate the hearing aids in terms of physical fit, stability, lateral migration, itching, appearance, and overall impression. They were also given a manual counter to count the number of times they felt the need to push the receiver back into their ear canal. After three days, the subjects returned to the clinic and the current Widex RIC users (Group 1) were fit with the Widex Easywear hearing aids and asked again to evaluate the aids over a three day trial. Non-Widex RIC users (Group 2) were not given the Easywear to wear outside the clinic in order to avoid any sound quality bias.

Clinician Evaluation

The subjects returned to the clinic after each three day trial. Two clinicians participated in collecting data from each subject. One clinician collected the survey data before leaving the room. A second clinician entered the room and had not been told which hearing aid the subject was wearing. The evaluating clinician then assessed the physical fit and appearance of the hearing aids while standing in front of the subject so as to not become aware of which hearing aids the subject was wearing. Each subject was asked to describe the situations under which they encountered lateral migration.

RESULTS

Patient Evaluation Results

The data collected from the Subjects' surveys is shown in figure 6 using a Likert scale (0 to 10 with 10 representing the best response and 0 indicating the worst response). A related sample Wilcoxon Signed Rank test revealed statistically significant ($p > 0.05$) preferences for the new Easywear over either the standard Widex RICs or non-Widex RICs for physical fit, stability, lateral migration, itching, and overall impression. There was no statistical difference between the standard Widex RICs and the non-Widex RICs.

The situations that produced lateral migration for each of the subjects is shown in table 1. The manual counter data indicated the mean number of migration occurrence using the standard Widex RIC was 15 compared with only 2 for the new Easywear.

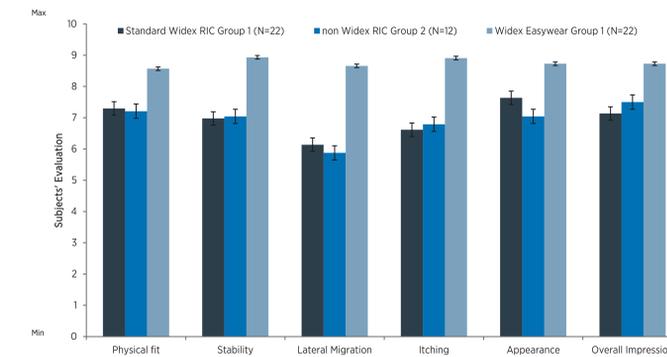


Figure 6: The average scores for subjects' evaluation of physical fit, stability, lateral migration, appearance, and overall impression of the "standard" Widex RIC (Group 1), non-Widex RIC (Group 2), and the new Widex Easywear (Group 1).

	Current Widex RIC Users (Group 1)	Non-Widex RIC Users (Group 2)	Widex Easywear (Group 1)
Slips out gradually	5	6	0
Head movements	2	1	0
Cosmetic gap	2	0	0
Talking	5	0	0
Eating	2	0	0
Chewing	4	3	3
Other	2	2	0

Table 1: The situations reported for each group that produced lateral migration. Current Widex RIC users are in the left column, non-Widex RIC users are in the middle column, reports from current Widex users while wearing the Easywear is in the right column.

Clinician Evaluation Results

The mean scores for the physical fit and appearance of each hearing aid as assessed by the evaluating clinician are shown in figure 7. A related sample Wilcoxon Signed Rank test revealed statistically significant ($p > 0.05$) preferences for the new Easywear over either the standard Widex RICs or non-Widex RICs.

RESULTS (CONT.)

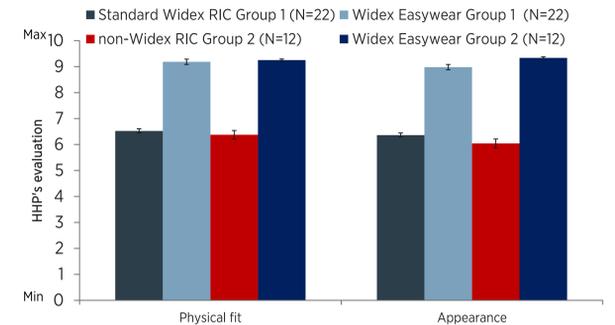


Figure 7: Mean ratings for the clinicians' evaluations of the Group 1 standard Widex RIC compared with the Easywear and Group 2 non-Widex RIC compared with Easywear. Ratings for physical fit are shown on the left. Ratings for appearance are shown on the right.

The percentage of subjects for whom the evaluating clinician indicated a preference for physical fit and appearance are shown in table 2. Easywear was selected as the preferred device for 73% (physical fit and appearance) of the Group 1 subjects and for 83% (physical fit) and 75% (appearance) of Group 2 subjects. The evaluating clinician never selected the Group 2 subjects' own devices for either physical fit or appearance.

Widex (group 1) Subjects - Clinicians' Evaluation			
	Easywear better than own (%)	Easywear and own aid the same (%)	Easywear worse than own(%)
Physical fit (ears)	72.7	18.2	9.1
Appearance (ears)	72.7	9.1	18.2

Non-Widex (group 2) Subjects - Clinicians' Evaluation			
	Easywear better than own (%)	Easywear and own aid the same (%)	Easywear worse than own(%)
Physical fit (ears)	83.3	16.7	0
Appearance (ears)	75.0	25.0	0

Table 2: Clinician's evaluation for physical fit and appearance. The numbers shown are the percentage of subjects for whom the clinician's selected either the Easywear (left column), the subject's own aid (right column), or no preference (center column).

CONCLUSIONS

The new Widex Easywear ear wire design reduces lateral migration and cosmetic gaps when compared with standard ear wire solutions. Both the subjects' and clinicians' data indicate that while there was no significant preference seen between the standard Widex RICs and non-Widex RICs ear wire solutions, there is a clear, statistically significant preference for the new Widex Easywear over the standard Widex RICs and non-Widex RICs.

Acknowledgements

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