Field Study News

Phonak PilotOne

Easy handling and maximum effectiveness

Summary

The essential criteria for a remote control are that it should be intuitive to use and the operating controls should be arranged ergonomically. If the remote control is used to control a hearing instrument, then the special requirements of the target group must be taken into account. In order to find out what these requirements were, a usability study was carried out. The findings were incorporated into the PilotOne remote control for Phonak hearing instruments and tested for functionality (fitness for purpose) and ease of use. Twenty hearing-impaired volunteers took part in the survey, all fitted with hearing instruments binaurally. The results confirmed that PilotOne is not only simple to understand but also easy and convenient to use.

Introduction

In order to develop the PilotOne, interviews were carried out in collaboration with the Rapperswil University of Applied Sciences, the University of Basel and the company Zühlke Engineering AG under the title "Identifying the user requirements for a remote control for Phonak hearing instruments". Twenty individual interviews were carried out with experienced users of hearing instruments, some of whom had had used a remote control. During these interviews questions were discussed relating to shape, size and weight and the size and layout of the buttons. From the findings that were obtained, the following parameters were derived for the PilotOne:

- Length should be 8 cm, width 2.5 cm to 4 cm, depth 1 – 1.5 cm.
- The weight should be about 25 grams.
- The size of the buttons should be about the diameter of a fingertip (∅ 1 cm -1.5 cm).
- Switching to a different hearing program by holding the button down should not begin a separate function but acts as a short cut, e.g. in order to select a particular program directly but not to alter the volume.
- A clearly visible locking function for the buttons should be available, and this should be quick and easy to use.
- There should be some means of fastening the device (e.g. to a key ring or by a loop round the neck). However, for users who do not want an attachment device, there should be no unnecessary fastening mechanism.

Picture 1: PilotOne remote control for Phonak hearing instruments

- The range of a remote control should be 1 meter, so that it can be placed in a handbag or trouser/jacket pocket.
- Acoustic feedback is a "must". Additional tactile feedback when a button is pressed would also be generally well received.
- The PilotOne is powered by the user's preferred AAA battery.

Aims of the study

The aim of the study was to validate a newly developed remote control that was intended to be as easy to use as possible. The remote control was developed based on findings from twenty individual interviews.

Structure and implementation of the study

The study was carried out at the Phonak Hearing Center in Stäfa, Switzerland. 20 volunteers with moderate hearing loss were supplied with Phonak Ambra hearing instruments in both ears and the PilotOne. In a test/retest comparison, two different methods of transmission were compared.
Ten of these volunteers took part in the first test and a further 10 in the retest.
Initially, the volunteers were not told how the buttons worked. This was

to test whether they could use the PilotOne intuitively to change the volume and programs. After that, the researchers tested whether the volunteers could use it after having the buttons explained once.

All the functions of the PilotOne were also tested by the volunteers in their everyday lives over a period of 3 weeks to find out how well they worked and how easy it was to handle. The hearing instruments had the following programs which could be selected manually:

Program 1: "Speech in a quiet environment"
Program 2: "Speech in a noisy environment"
Program 3: "Comfort in a noisy environment"
Program 4: "Music"
Program 5: "Muting the hearing instrument"
Automatic: "Automatic functioning of the HI"

Depending on the type of hearing instrument, the (+) and (–) buttons regulate the volume, the programs or speech intelligibility (+) and hearing comfort (-), by using different sound cleaning functions. The Home button resets the volume to the startup level and puts the hearing instrument into automatic mode. The locking function was achieved via a sliding switch on the side of the PilotOne (see Fig. 1). The program change and Home buttons were also each given one additional function which could be activated by holding them down (3 seconds). The program change button directly activated Program 2 and the Home button activated the mute function of the hearing instrument. The PilotOne has an LED status light to give the user visual feedback when using the buttons. When a button is pressed, the LED is green. The LED also comes on briefly when the program is changed, depending on the program number. The user is also given acoustic feedback via the hearing instrument. When the PilotOne is switched on there is a long signal from the green LED. If the light flashes red when a button is pressed, the battery in the PilotOne needs changing.

During the three-week test period, the volunteers had the task of using the PilotOne to change the programs and adjust the volume on their hearing instruments in various everyday hearing situations.

The study also recorded the subjective opinions of the volunteers in relation to the size, weight, button layout and structure of the PilotOne.

Results

All the volunteers were able to use the locking facility for the on/off function of the PilotOne. All the volunteers with instruction understood how to control the volume and all the volunteers were able to change the volume without difficulty (Fig. 1.1). All the volunteers were also able to use the program change button to change the programs on the hearing instrument without difficulty. (Fig. 1.2).

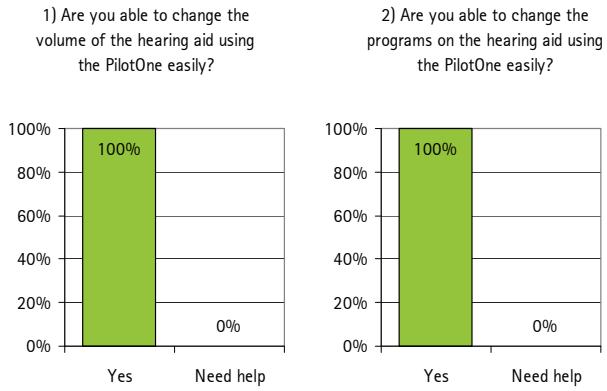

Figure 1: Volunteers were able to use the PilotOne to change both the volume (1) and the programs (2) without outside assistance

Without instructions, program and volume changes were intuitively made by 55% of the volunteers. 40% of the volunteers were also intuitively able to use the Home button to select the automatic program on the hearing instrument without instruction. After having it explained once, all the volunteers were able to use this function. After first being given instructions, all the volunteers were able to activate the special functions by holding down the program button and the Home button. All the volunteers were satisfied with the size of the PilotOne. 80% of the volunteers found the shape and 90% found the weight of the PilotOne to be "just right". All the volunteers were very pleased with the ease of use and the convenience of the buttons and with the general feel of the PilotOne. All the volunteers understood how the short flashing LED signal worked when a program was changed. 60% of the volunteers understood intuitively the function of the long flashing LED signal. 80% of the volunteers were able to remember all the functions of the PilotOne and, after a familiarization period of 5 minutes, could use them in their jacket or trouser pocket or handbag. The other volunteers had to glance at the PilotOne in order to operate it correctly.

Conclusion

The findings of this study show that PilotOne satisfies users' requirements for convenient and easy handling and has a button layout that is easily understood. In conclusion, the PilotOne remote control enables the user to easily adjust their hearing instruments to meet their particular everyday needs.

References

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