

## AUDIOLOGICAL ARTICLE

### ZEN – A NEW TOOL FOR HELPING HEARING AID USERS RELAX AND CONCENTRATE

**Stress is very common in people with hearing loss. Because it is well-documented that music may reduce stress and enhance concentration, Widex has included a feature in the mind400 hearing aid which allows users to listen to music.**

#### **STRESS – A FREQUENT COMPANION OF HEARING LOSS**

Having a hearing loss can be quite resource-demanding. Simply listening often requires a lot of effort, and tiredness or exhaustion, concentration problems and stress often accompany hearing loss. Studies have shown that stress is much more common in hearing-impaired people than in normal-hearing people<sup>1, 2</sup>. A fairly large proportion of the hearing-impaired also suffer from tinnitus. Those people are under double strain. Not only do they have to make an effort to hear, they also use a lot of energy trying to ignore the constant sound in their ears. The effect can be quite severe or even debilitating, disrupting sleep, family relations and the ability to work. Stress, irritability, lack of concentration and low quality of life may be the result.



The stress-related consequences of hearing loss and tinnitus have motivated Widex to develop a special feature for relaxation and concentration. The feature known as Zen, which is included in the mind440 hearing aid, exploits the ability of music to enhance relaxation and concentration.

#### **MUSIC CAN REDUCE STRESS AND ENHANCE CONCENTRATION**

The psychological effects of music have been widely studied. It has been found that relaxing music can affect the unconscious part of our nervous system, reducing breathing rate, heart rhythm, chronic stress and blood pressure. Studies have even shown that music is better at enhancing relaxation than silence<sup>3</sup>.

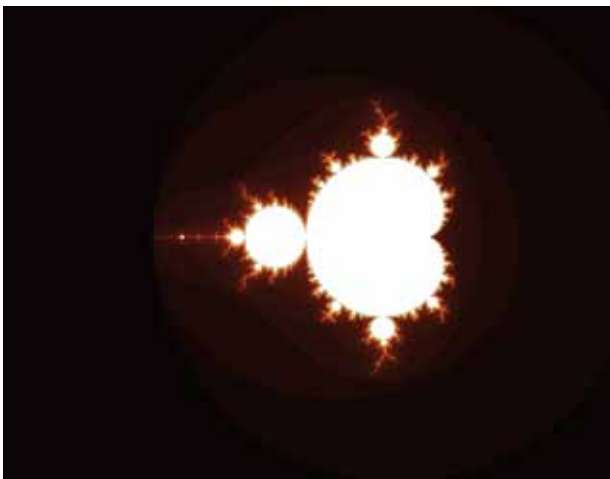
It is generally agreed that music can affect people psychologically, making them feel more relaxed and less anxious. Studies conducted at hospitals have also shown that music decreased the amount of stress patients experienced and the amount of pain-killing medicine needed<sup>4</sup>.

Music's ability to improve concentration has also been investigated. Not unexpectedly, noise has turned out to create stress and negatively affect concentration. Several strategies have been tested to see if they would improve concentration in noisy environments, including white noise masking and background music.



### THE ZEN STYLES IN THE MIND440 HEARING AID

While the ability of music to enhance relaxation and concentration is well-documented, it is clear that not all music will produce the desired effect. The music must be simple, instrumental, non-repetitive, and without lyrics to be relaxing and improve concentration. Its basic rhythm must be slow, and elements which may evoke strong emotions in the listener, such as lyrics, should be avoided. People can respond very differently to the same music; a tune perceived as pleasant by one person may be perceived as annoying by another. People must therefore have a choice of different music styles. Adjustable volume is also important, and the music should be predictable without sudden changes. Zen™ styles from Widex meet all these requirements. In the Widex Zen™ program, the music is based on fractal technology, which ensures that the music is predictable without repeating itself. The user has a choice of “musical tones” called Zen styles, and it is possible to further individualise these by adjusting



*A fractal is a shape that can be split into parts, each of which is to a large extent a reduced-size copy of the whole.*

tempo and pitch. The music consists of soothing tones with no lyrics to avoid strong emotions in the listener. The volume can be adjusted in the fitting software or by using the volume control on the hearing aid.

To make sure that the Zen tones are audible at all times the Zen™ program takes the individual hearing loss and background noise into consideration when generating the fractal music.

Instrumental music and broadband noise are sometimes also used in combination with counselling to manage tinnitus. A broadband noise has therefore been included in the Zen program alongside the Zen styles to be used by dispensers if they wish.

### STUDIES ON THE EFFECT OF THE ZEN STYLES

The ability of the Zen styles to help hearing aid users concentrate and relax has been tested in several studies. In a clinical field trial conducted by Widex' Applied Research Team, 32 hearing-impaired persons with mild to profound hearing losses tested three Zen styles for an average of 18 days. They rated their overall impression of the Zen styles on a 0 to 10 point scale with 0 being “very bad” and 10 being “very good”.

As many as 85% of the subjects rated the Zen styles in the centre of the scale or upwards. 44% rated them as either “good” or “very good”. Only 15% rated them as “bad” or “very bad”. These results suggest that the Zen styles may be used for relaxation by many hearing aid users.

The same conclusion was reached by Kuk & Peeters<sup>5</sup>, who tested if the Zen styles could help hearing aid users concentrate and relax. 14 people with mild to moderately severe hearing losses rated four Zen styles in terms of how relaxing they found them on a 1-5 point scale with 1 being “very relaxing” and 5 being “very tensing”.

The majority responded “Very relaxing” or “Somewhat relaxing” for all four Zen styles (70% on average). And, after fine tuning of the pitch and tempo of each person's favourite Zen style, 86% found their preferred Zen style to be relaxing. This highlights the importance of adjustability and choice between different music styles. The results from the concentration task were also very positive. They showed a significantly better performance when the Zen styles were active than when they were deactivated. Thus, Kuk and Peeters' results indicate that the Zen styles may enhance both relaxation and concentration in people with a hearing loss.

## CONCLUSION

Because of the high occurrence of stress in people with hearing loss, Widex has included the Zen program, which enables hearing aid users to listen to music, in the mind440 hearing aid. Music has been found to reduce stress and enhance concentration. But the music must be simple, instrumental, non-repetitive and without lyrics. The Zen styles from Widex meet those requirements. Results from two studies on the Zen styles' ability to help people with hearing loss relax and concentrate suggest that the Zen styles may be helpful to a large proportion of hearing aid users. Instrumental music and broadband noise may also be used in combination with counselling to manage tinnitus. A broadband noise is therefore included in the Zen program.

For more information on the Zen program in mind440, please visit [www.widex.pro/mind440](http://www.widex.pro/mind440)

## REFERENCES

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- 5 Kuk, F., & Peeters, H. (2008). The hearing aid as a music synthesizer. *Hearing Review*, 15(11).