Phonak Insight

Empowering clients to achieve their hearing and health goals: Phonak Audéo Fit™ and the myPhonak app with health data tracking

Regular physical activity is important for both physical and mental health[1]. Accumulating evidence shows that people with hearing loss move less than their normal-hearing peers.[2-5] Audéo Fit and the myPhonak app combine health data tracking, unrivaled[*] sound quality[6] and universal connectivity to help support clients' overall well-being.

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Key highlights

- Health data trackers can help increase physical activity and engagement in healthy behaviors[10-13]
- There are advantages of tracking health/wellness parameters using an ear-level device[17-22]
- Audéo Fit and the myPhonak app allow health data tracking for: (1) heart rate, (2) steps, (3) activity levels, (4) distance walked or ran, as well as setting goals and viewing average wearing time in different sound environments.

Considerations for practice

- Empower clients beyond hearing improvement with a solution that also enables them to track their activities (without having to wear other devices).
- Audéo Fit tracks and displays the resting heart rate. Lower resting heart rate is linked to better health over the long-term.[25, 26]
- Tracking physical activity can motivate clients to engage more with their health.[10, 11] Audéo Fit empowers clients to increase engagement with the option to set goals.

*compared to Phonak Audéo™ Marvel

Regular physical activity is important for both physical and mental health

The first principle in the preamble to the World Health Organization (WHO)'s constitution states that 'health' is "not merely the absence of disease", but in fact, it is "a state of complete physical, mental and social well-being".[7] Physical activity is good for hearts, bodies and minds.[1] Regular physical activity can help prevent and manage illnesses such as heart disease, type-2 diabetes, and cancer, which cause nearly three-quarters of deaths worldwide. Physical activity can also reduce symptoms of depression and anxiety and enhance thinking, learning, and overall well-being.[1]

Accumulating evidence suggests that people with hearing loss move less, and move less well, than their normal hearing peers

Hearing loss is associated with chronic conditions such as diabetes, cognitive impairment, increased risk of falls, depression and cardiovascular risk factors.[8] Additionally, preliminary evidence suggests that in adults aged 50 years and above, hearing loss might be associated with a higher likelihood of physical inactivity.[2-4] Furthermore, there is evidence to support the proposition that in adults aged 60 years and above, hearing loss is associated with limitations in physical mobility as well as constraints in conducting activities of daily living such as walking and taking the stairs.[5] Interactions between hearing loss, hearing aid use, fatigue, and activity levels are beginning to be explored.[9] Additional studies with well-controlled designs are needed before more confident conclusions can be made regarding the impact of the complex relationships amongst these variables on overall well-being.

Mobile health interventions can help increase physical activity and engagement in healthy behaviors

The recent rise in physiological monitoring and analytics via the use of wearables (such as motion trackers and step counters), smartphone-based monitoring, and remote monitoring of health data has accompanied a trend towards maintaining health and preventing disease, rather than managing disease once it has already happened.[8] These tools make it possible for individuals to be more engaged in navigating their own health.

For adults aged 50 years and over, scientific evidence indicates that mobile health interventions increase physical activity and may facilitate engagement in healthful behaviors.[10, 11] In adults aged 18 years and over, Marcolino and colleagues[11] found that mobile health interventions improved healthcare appointment attendance rates, smoking abstinence and symptoms in asthma patients. The United States 2018 Physical Activity Guidelines Advisory Committee[12] also highlighted that wearable activity monitors, including step counters and accelerometers, when used in conjunction with goal-setting and other behavioural strategies, can help increase physical activity.

A recent systematic review and meta-analysis of the literature[13] investigated the efficacy of technologies such as apps and websites, targeting physical activity and sedentary behavior in adults aged 50 years and above. Several studies included in this review revealed that the use of these technologies increased total physical activity and reduced sedentary time, though these behavior changes were not sustained long-term (>1 year).

Indeed, a major challenge with apps and trackers is a high drop off rate, with a third of users of activity trackers abandoning their device in the first 6 months.[14] Taken together, this evidence highlights an important question: what might help to maintain daily physical activity? It has been suggested that providing features like goal setting, personalisation and game-like functionality within technologies, may facilitate engagement, promote retention, and increase intervention effectiveness.[15, 16]

Potential advantages of tracking health/wellness parameters using an ear-level device

Research has shown that the ear can give us access to accurate health data.[17-19] Many physical activity technologies, such as fitness watches, track the wearer's heart rate using photoplethysmography (PPG), a technique in which light emitting diodes (LEDs) shine light into the skin (e.g., on the wearer's finger or wrist), and an optical sensor detects how much light is reflected back. When the volume of blood in the blood vessels is high, more light is absorbed and therefore the intensity of the light that is reflected back is lower. The rate at which the intensity of the reflected light changes from high to low indicates how quickly the blood vessel volume is changing from low to high, allowing the number of beats per minute (i.e., heart rate) to be calculated and displayed.

Preliminary evidence suggests that optical heart rate sensors worn in or just outside the ear perform at least as well as those worn on the wrist[20], and potentially yield PPG signals that may be more easily analysed than those measured at the upper wrist.[21] Further, there are some advantages to PPG measurement in the ear. For example, the ability to reliably record PPG signals from the ear canal may facilitate tracking other physiologic metrics, such as blood oxygen saturation.[22] Blood perfusion around the ear is typically quite robust, likely because this area is supplied by branches of the carotid artery - the primary blood vessel supplying blood to the brain.[8, 19]

In addition, the ear canal maintains a temperature closer to that of the body's core, compared to other, more peripheral sites of PPG measurement (e.g., fingers), which are substantially more likely to be susceptible to constriction/dilation of the blood vessels.[19, 22] Moreover, the skin in the ear canal is unaffected by factors such as differences in melanin concentration and the presence of tattoos, which can influence light absorption.[23]

Phonak Audéo Fit with health data tracking

First and foremost, Audéo Fit is still a hearing aid and offers everything that we have come to expect such as unrivaled* sound quality[6], universal connectivity and rechargeability. Coupled with the Audéo Fit, the myPhonak app, offers the possibility to display health data and control the hearing aids.

What can Audéo Fit do? With health data tracking, clients are able to:

(1) Track heart rate. Each person's heart rate is unique and influenced by various factors including their age, gender, current physical and mental health, whether they tend to have a physically active lifestyle or not, body temperature, as well as some medications.[24] Audéo Fit, together with the myPhonak app, tracks and displays the average resting heart rate, which will be calculated after the hearing aids have been worn for a minimum of four hours. Lower resting heart rate is linked to better health over the long-term.[25, 26] Heart rate has been a useful and widely used index of physical exertion and intensities of effort during physical activity.[27] In addition to the resting heart rate, an 'on-demand heart rate' is calculated every 2-3 seconds which may be helpful for clients to track their heart rate while exercising. The heart rate patterns can be displayed on a daily, weekly, monthly and yearly basis.

(2) Count steps. Step count has become a common way to measure a person's overall physical activity across the day.[12] The motion sensor chip found in Audéo Fit detects steps based on the signal from the built-in accelerometer. Step length estimates are then used to calculate the total distance walked or ran. Healthy adults tend to take between 4,000 and 18,000 steps per day, and recent scientific evidence shows that a relatively modest daily step count of ≥7,000 steps is an acceptable daily goal.[28] For people who struggle to walk due to limited mobility or medical conditions, some steps are better than none at all.[29]

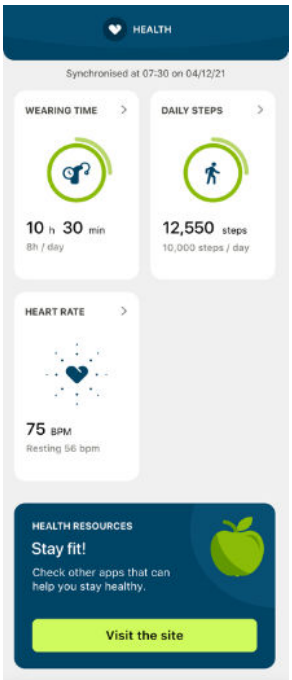
(3) Track activity levels. Gaining insights into overall health and well-being can help clients make more healthful daily lifestyle choices.[10, 11] Audéo Fit tracks activity levels throughout the day. Using data from the built-in accelerometer, clients can track how long they have spent exercising at different activity levels using the myPhonak app: (1) None: for example reading a book or resting (2) Low: light-intensity activity such as household work (3) Medium: moderate-intensity activity such as walking and (4) High: high-intensity activity such as brisk walking, jogging or running.

(4) Set (optional) motivational goals. Goals specifically address the most important needs of the client. Tracking physical activity can motivate users to engage more with their health.[10-12] With the latest myPhonak app, clients can set goals and view the average wearing time of the hearing aids in different sound environments - Calm situations, Noisy situations, Music and Streaming - which can help them to acclimatise in a variety of different listening situations. Additionally, goals for steps can be set. Setting goals for wearing time and steps could motivate clients to increase their hearing aid usage and activity.

(5) View distance walked or ran. Audéo Fit can compute the distance walked or ran by adding up all the step length estimates.

(6) Track wearing time. More frequent use of hearing aids is associated with greater improvements in speech perception, self-reported listening disability and quality of life.[31] Audéo Fit allows the opportunity for goal setting to track progress and help maintain motivation as clients get used to their hearing aids.

The latest myPhonak app provides a user-friendly way to access these health data tracked by Audéo Fit. Audéo Fit is designed for clients who want to hear well and are also interested in engaging with their health.



*The information contained is for educational and informational purposes only. Clients should not use the information as a substitute for, nor should it replace, professional medical advice. If clients have any questions about their health, or before beginning an exercise program, they should always consult with a physician or other health-care professionals.

Figure 1: Example of health data tracking with Audéo Fit and the myPhonak app*.

Practical tips for exercising more

As mentioned, exercise is important for our mental and physical health. The WHO 2020 guidelines[1] show that there are lots of types of physical activity that can be incorporated into daily life, as well as in more structured exercise activities. These can include jogging, cycling, leisure activities, physical activity in the household (such as housework) and using your body as a form of transport (such as walking to work). There are lots of opportunities to exercise routinely. Audéo Fit can track health data while the hearing aids are worn.

Conclusions

The latest WHO guidelines[1] highlight how movement is fundamental to healthy lives, both physically and emotionally. Recent scientific research has also demonstrated that hearing loss is associated with a higher likelihood of physical inactivity and that health trackers can motivate more physical movement. At Phonak, Well-Hearing is Well-Being. Audéo Fit and the myPhonak app combine health data tracking as well as unrivaled* sound quality[6], connectivity and rechargeability in order to empower clients to live their healthiest lives. Audéo Fit is the new Lumity solution that enables clients to continuously track their health data and activities.

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