



SilverFit Mile

The SilverFit Mile gives the feeling of freedom as if cycling outdoors. This is especially valuable for clients who are in a hospital or a nursing home setting. Participants are absorbed in cycling routes through varied landscapes and can feel at one with nature in the countryside, visit the seaside and even navigate in a busy city. The interactive system can be connected to a home trainer or active-passive trainer. Landscapes are displayed on a large screen and video speed is adjusted to cycle speed. These pleasant experiences lead to motivated clients who train longer and more frequently.

SilverFit Mile

Virtual bike rides

Therapeutic benefit

The positive effects of cycling on recovery are well known. Cycling is beneficial in many different scenarios, for instance regaining physical condition after a stroke, decreasing the effects of immobilization in the ICU or to maintain fitness throughout kidney dialysis. Cycling in virtual reality is more fulfilling and a refreshing break from reality. It also improves motivation to exercise, resulting in longer and more frequent sessions. By placing the screen at the right height, an active posture can be maintained.

Safe use

The SilverFit Mile routes are not virtually generated but real-life landscapes. The videos are recorded all over the world using a camera capable of high stability footage. This reduces the risk of nausea or feeling unsteady. Besides the option to adapt the speed of film to the cycle speed, the therapist can also manually adjust the speed and resistance. In this way, each session is sufficiently challenging for each client.

A wide choice of routes

In addition to offering more than 100 routes from around the world, the SilverFit Mile allows its users to design customized routes on Google Street View. The therapist can create unique routes around the hospital or retirement home. The client can also cycle through old neighbourhoods or around family homes for a sense of familiarity.

With the SilverFit Mile, it is also possible to upload personal photos or videos to the system. Clients or family can transfer personal photos or films onto the system and allow the participant to cycle in familiar places or to enjoy cherished moments through slideshows.

In addition to this, the SilverFit Mile has a reminiscent functionality called Memory Lanes. This entails clients cycling while various images of old European cities are displayed. This is certainly a conversation starter among the clients and a great option for group activities.

Longer training sessions

The virtual landscapes serve as a welcome distraction to increase training duration. Clients become absorbed in the route they are cycling. They are often intrigued by what they will find around the next corner and continue cycling. Many participants set goals based on the landscape instead of the distance, for example: "This time I'm going further than the church!"

Also, routes are divided into stages and it is possible to pick-up at the point where the previous session ended.



The SilverFit Mile can be used with different types of equipment.



A bike ride is also possible from a bed.

SilverFit Mile

Virtual bike rides

Quality medical device

At SilverFit, the safety of clients is foremost. All our systems, including the SilverFit Mile, meet high quality standards. The SilverFit Mile is a Class I medical device and complies with the latest European legislation. To obtain this classification, SilverFit undergoes the long documentation process during product development to demonstrate the minimal risk to safety in practice.

Adaptable to any equipment

The SilverFit Mile can be connected to almost any home trainer, active-passive trainer, treadmill and bed bike. Certain facilities have opted to create a dedicated "corner" with several SilverFit Mile devices. This setup brings out the social aspect of exercise, allowing people to converse while cycling together.



SilverFit Mile

Scientific background

Higher adherence rates

Rhodes et al. (2009) investigated the effect on adherence when cycling without virtual images in comparison to cycling with virtual images. Results showed increased adherence when cycling with virtual images.

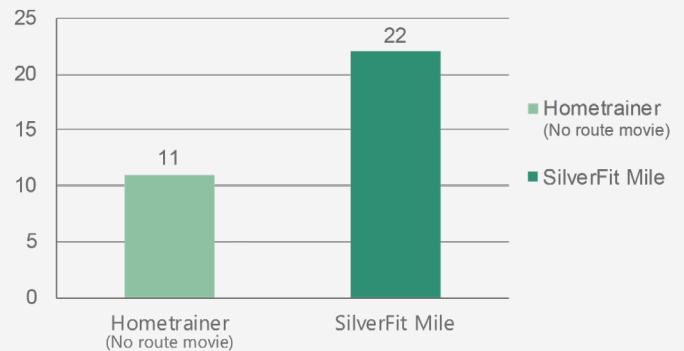
Positive effect on cognition

Anderson-Hanley et al. (2012) demonstrated the positive effect of physical effort on higher cognitive functions, such as planning and attention. The results show improved cognitive functioning when cycling with virtual images as opposed to no imagery. Moreover, adherence is higher when an interactive game is incorporated into therapy, as reported by *Warborton et al. (2007)*. Virtual reality has also been shown to increase the intensity of training sessions.

Training time doubles with the SilverFit Mile

9 participants cycled on an exercise bike without route movies vs with the SilverFit Mile, until fatigued.

Average duration session (in minutes)



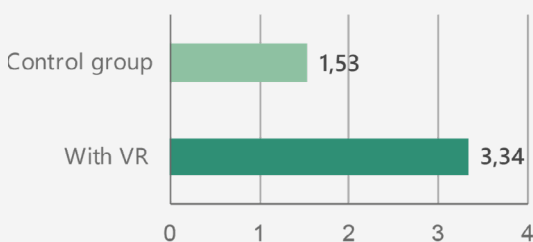
Source: *Pisica Donose et al. (2016)*

Walking with virtual images results in improved balance

30 post-stroke participants (average \pm 65 years) joined a 6-week program consisting of 30 minutes treadmill walking, 3x per week. The intervention group saw realistic videos (with VR) while training, the control group had no video.

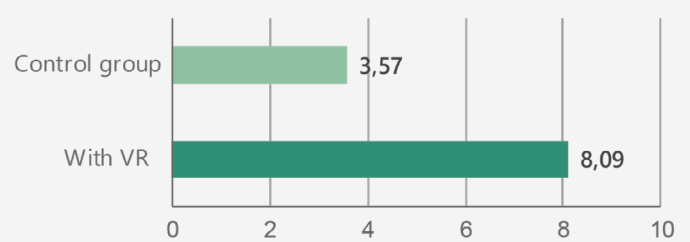
Berg Balance Scale

improvement after intervention (score)



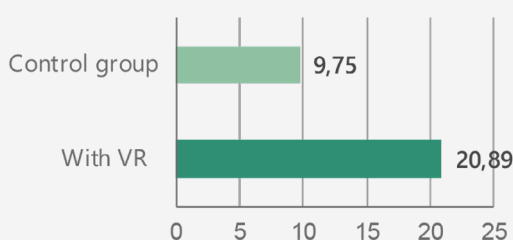
Stride length

improvement after intervention (cm)



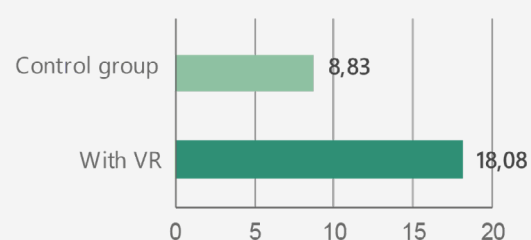
Speed

Improvement after intervention (cm/s)



Cadence

Improvement after intervention (steps per min)



Source: *Cho & Lee (2014)*

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Literature

- Anderson-Hanley, C., Arciero, P.J., Brickman, A.M., Nimon, J.P., Okuma, N., Westen, S.C., & Zimmerman, E.A. (2012). Exergaming and older adult cognition: A cluster randomized clinical trial. *American Journal of Preventive Medicine*, 42(2), 109-119.
- Bonato, F., Bubka, A., & Palmissiano, S. (2009). Combined pitch and roll and cybersickness in a virtual environment. *Aviation, Space and Environmental Medicine*, 80(11), 941- 945.
- Cho, K.H., & Lee, W.H. (2014). Effect of treadmill training based real-world video recording on balance and gait in chronic stroke patients: a randomized controlled trial. *Gait & Posture*, 39(1), 523-528.
- Chuang, T.Y., Sung, W.H., Chang, H.A., & Wang, R.Y. (2006). Effect of a virtual reality-enhanced exercise protocol after coronary artery bypass grafting. *Physical Therapy*, 86(10), 1369-1377.
- Feenstra, A. (2014). Kan fietsen in een virtuele omgeving leiden tot een verhoogde belastbaarheid bij kwetsbare ouderen? [Will cycling in a virtual environment lead to increased exertion in frail elderly?] (Unpublished Bachelor's thesis). Avans University of Applied Sciences.
- Mirelman, A., Rochester, L., Maidan, I., Del Din, S., Alcock, L., Nieuwhof, F., Hausdorff, J.M. (2016). Addition of a nonimmersive virtual reality component to treadmill training to reduce fall risk in older adults (V-TIME): a randomized controlled trial. *Lancet*, 388(10050), 1170-1182.
- Nishiike, S., Okazaki, S., Watanabe, H., Akizuki, H., Imai, T., Uno, A., Inohara, H. (2013). The effect of visualvestibulosomatosensory conflict induced by virtual reality on postural stability in humans. *Journal of Medical Investigation*, 60(3-4), 236-239.
- Pisica Donose, G., Razzolini, O., Bardgett, M. Lim, F., & Samarcq, L. (2017). Impact of using the SilverFit Mile videos on training time. Presented at congres fragilité, Paris, France.
- Rhodes, R.E., Warburton, D.E.R., & Bredin, S.S.D. (2009). Predicting the effect of interactive video bikes on exercise adherence: an efficacy trial. *Psychology, Health & Medicine*, 14(6), 631-640.
- Warburton, D.E.R., Bredin, S.S.D., Horita, L.T.L., Zbogor, D., Scott, J.M., Esch, B.T.A., & Rhodes, R.E. (2007). The health benefits of interactive video game exercise. *Applied Physiology Nutrition, and Metabolism*, 32, 655-663.
- Warburton, D.E.R., Sarkany, D., Johnson, M., Rhodes, R.E., Whitford, W., Esch, B.T.A., ...Bredin, S.S.D. (2009). Metabolic Requirements of Interactive Video Game Cycling. *Medicine & Science in Sports & Exercise*, 41(4), 920-926.

For an overview of all scientific research about SilverFit, [click here](#)



