



# SilverFit Flow

The SilverFit Flow is a virtual therapy system offering rehabilitative exercises for lung conditions. Clients perform respiratory training by playing interactive games on the SilverFit Flow. A spirometer is used to measure both volume and flow of the inhalation and exhalation. The values reflect directly into the game, providing the client with visual feedback for improvements. Clients are motivated to train and remain focused on the training for longer because of engaging games and a user-friendly interface. All training data and scores are recorded in the system, making progress visible to the client and easy to analyse for the therapist.

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## Respiratory training

### Importance of breathing exercises

People with diabetes associated lung disease, COPD and asthma often suffer from shortness of breath (dyspnea). Also, long-term illness and artificial respiration in intensive care lead to respiratory complications.

Breathing exercises are crucial to regaining full functionality and resuming activities of daily life (Snoeck-Stroband et al. 2015; Gosselink et al. 2011a). The exercises help the client to regain control of breathing and offer relief from shortness of breath.

### Interactive and motivational games

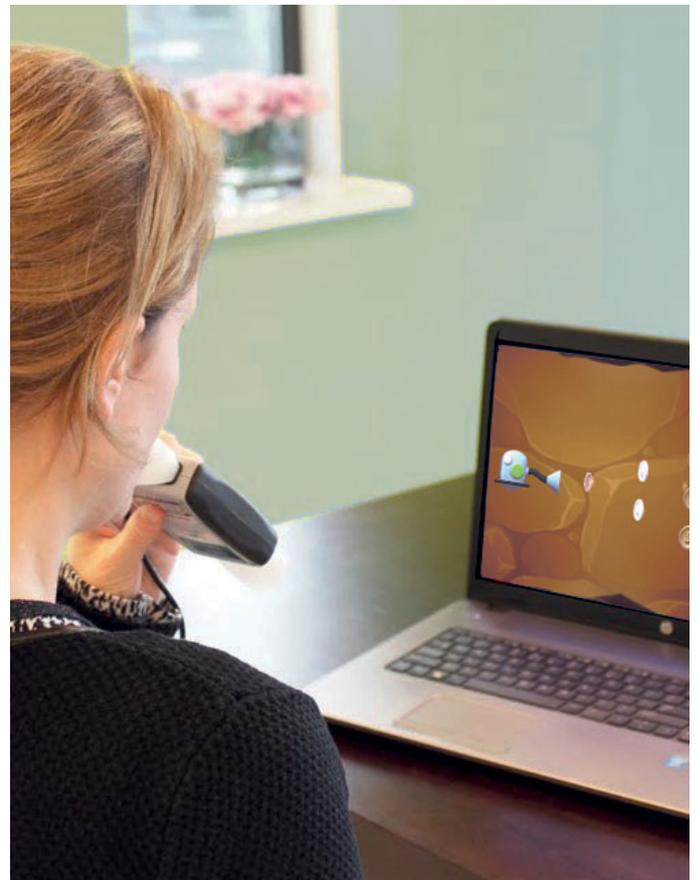
Respiratory training is often perceived as repetitive and tedious. The games offered on the SilverFit Flow are interactive and engaging, changing a usual training session into an enjoyable activity. The objectives of the game vary and are achieved by

adapting the breath volume and flow through the spirometer. The spirometer is a medical device which measures the volume and flow of each inhalation and exhalation. This data is transferred to the SilverFit Flow.

Visually seeing the changes of the breath helps clients understand treatment goals and motivates them to improve performance. This also gives the patient freedom to train efficiently and independently. Ultimately, leading to more frequent training and positively influencing recovery time.

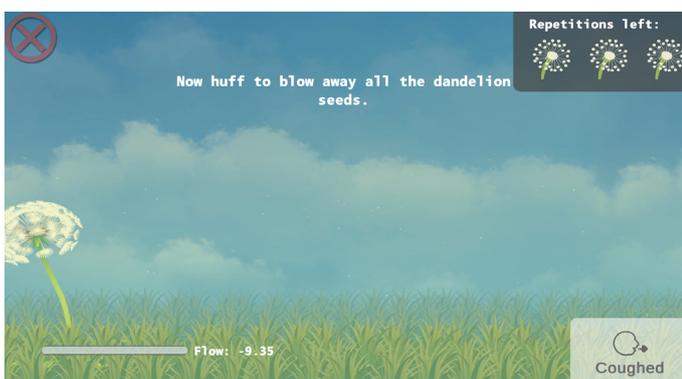
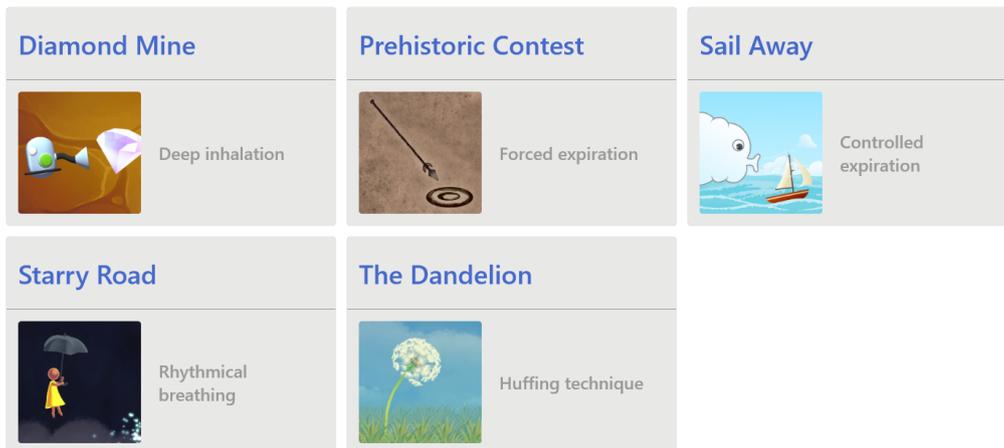
### Keeping track and making adjustments

All progress is recorded and stored in the system. The therapist can easily monitor the client's progress and analyse performance. Patients stay motivated by achieving new scores and get insights into their personal progression.



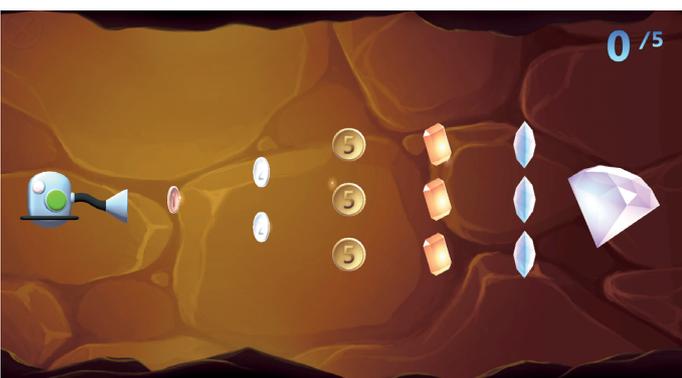
# SilverFit Flow

## Overview of the exercises



## The Dandelion

This exercise trains the lungs according to the Active Cycle of Breathing Technique (ACBT). The technique includes deep, controlled breathing in combination with a technique to mobilize sputum, called a huff. A visualization of a dandelion is used to make the huff technique easier to understand and perform. While keeping the airways open, the patient exhales slowly and forcefully to blow all the dandelion seeds into the air. This is followed by relaxed breathing to recover.



## Diamond Mine

This exercise restores a normal breathing pattern and rhythm. Due to the chronic nature of many lung diseases, an imbalance occurs in the breathing pattern often leading to shortness of breath and shallow breathing. This relaxing and tranquil exercise teaches patients to inhale and exhale deeply, decreasing the number of breaths per minute.

# SilverFit Flow

## Overview of the exercises



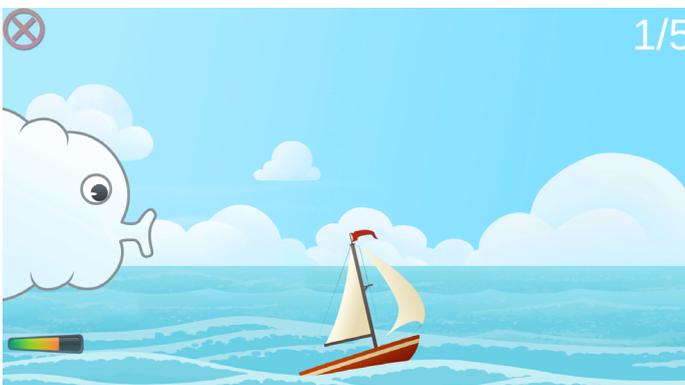
### Prehistoric Contest

This exercise aims to improve the forced expiratory volume (FET). The game is set in the prehistoric era and sees a cavewoman throwing a spear. The objective is to throw the spear as far as possible. The patient breathes in deeply and exhales forcefully. Exhaling forcefully triggers the spear to be thrown. The distance the spear travels through the air is determined by the exhaled flow.



### Starry Road

This exercise strengthens respiratory muscles and improves breath control. By inhaling as deeply as possible, the mining vacuum can attract as many treasures as possible. Once objective volume is reached, the mining vacuum gathers a beautiful diamond. This game also has a flow setting. This challenges the patient to maintain a certain volume over a set amount of time to reach the objective.



### Sail Away

The exercise is aimed at improving prolonged expiration. By controlling expiratory volume and flow, the client must navigate a sailboat to its destination port. In controlling expiration, a normal rhythm of breathing is restored. This is beneficial for asthma sufferers to decrease breathlessness. The exercise also strengthens the diaphragm eccentrically, leading to improved outcomes for COPD patients.

## Benefits of SilverFit Flow

- Visualizations improve the client's understanding of the exercise and lead to more effective execution.
- The client is engaged by the interactive exercises and motivated to train.
- The client can train independently, allowing multiple sessions per day.
- Progress is visible and clear for both the therapist and the client.
- Respiratory training for people with cognitive impairments or disability is made easier by the visual feedback from the games.

### Exercises recommended for COPD patients

Borge *et al.* (2014) published a review of the quality of systematic reviews examining the effect of respiratory muscle strength training on various symptoms associated with COPD. Five systematic reviews were considered, two of which were considered to be of high quality. The high-quality studies concluded that respiratory muscle training has a positive effect on shortness of breath, fatigue and quality of life in people living with COPD. The results are shown in the table below

Type of strength training	Shortness of breath	Fatigue	Quality of life	Study	Study quality
Inspiratory	✓	✓	✓	Gosselink, 2011b	High
Inspiratory and expiratory	✓	—	—	Thomas, 2010	High
Inspiratory	✓	—	✓	Geddes, 2008	Medium
Inspiratory	✓	—	✓	Shoemaker, 2009	Medium
Inspiratory	✓	—	✓	O'Brien, 2008	Medium

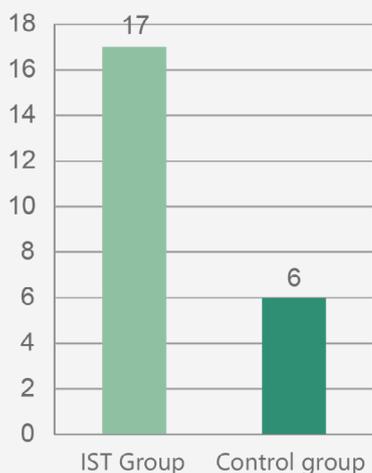
✓ Positive effect found    ✓ Effect unclear    — Effect not seen

### Breathing exercises after artificial ventilation

Bissett *et al.* (2016) looked at the effect that inspiratory muscle training has for patients who have been weaned from the ventilator. Significant improvement were measured in inspiratory muscle strength and quality of life in the group performing inspiratory muscle training (IST) as compared to the control group, which received regular care.

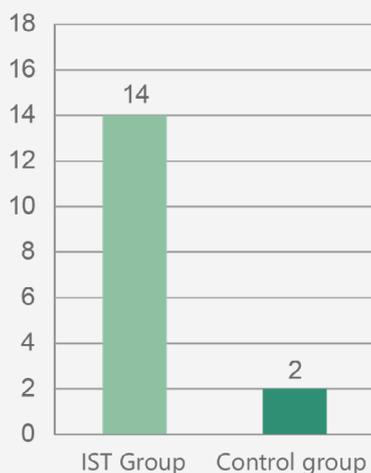
#### Increase in maximum inspiratory strength

Percentage (%)



#### Increase in quality of life

Score



70 patients after  $\geq 7$  days on a ventilator (mean age 59 years). IST group once daily inspiratory strength training for 5 days a week for 2 weeks. Control group receives regular care. IST; Inspiratory strength training.

■ IST Group  
■ Control group

Source: Bissett *et al.* (2016)

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## Literture

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

