



groovtube

User Guide



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## Chapter 1

# Children with a chronic condition who have trouble breathing

The requirements for an optimal breathing pattern lie within the areas of muscle power, mobility and posture. Children with a chronic lung condition, neuromuscular condition, or a central neurological condition, fail to have these breathing requirements fulfilled due to their condition.

When the muscle power of the breathing muscles is not adequate, it might cause an incomplete contraction of the aperture, disabling the lungs to expand completely and preventing air to fill the lungs entirely. This is commonly known as hyperventilation. Long term hyperventilation will lead to oxygen deficiency that might cause discomforts such as; headaches when waking up, tiredness throughout the day, lack of appetite and concentration disorders.

More so, weak respiratory muscles may result in pneumonia and more frequent illness of the child. The weakened respiratory muscles will lessen the cough's force and not ventilate the lungs completely. This will cause the slime (mucus) to stay in the lungs and give more opportunity for the bacteria to grow here, leading to infections.

Along with this, the respiratory muscles are a necessity for swallowing and vocalization. When these are weakened it can cause problems with swallowing as well as talking and singing.

### When the breathing muscles are not functioning properly the following symptoms may appear:

- Difficulty sleeping
- Vivid and extensive dreams
- Tiredness upon waking
- Headaches upon waking
- Difficulty concentrating
- Lack of appetite in the morning
- Hyperventilation
- Weight loss
- Frequent sickness
- Difficulties with talking and singing.

\* Chronic lung condition: Chronic means the long term existence of a disease or one or two symptoms of the disease. Examples are Asthma, Cystic Fibrosis and COPD.

\*Neuromuscular condition: an encompassing label for a large group of conditions of the muscles, and the nerves that control these muscles. Neuromuscular conditions are also referred to as muscle disease, but there are often more tissues affected. There are over six hundred muscle diseases with a range of symptoms: Weakness of muscles, paralyzed muscles, pain and tingles. They all have one thing in common: The muscle power decreases. For most muscle diseases there is no cure. Treatment is directed at decreasing the symptoms. The most common examples are Duchenne DMD, Spinal muscular Atrophy: SMA, Arthrogryposis multiplex congenita: AMC, Amyotrophic lateral sclerosis: ALS, Pompe, congenital fibertype disproportion: CFTD, Becker's disease and multiple sclerosis: MS

\*Central neurological conditions / Conditions in the brain: When we speak of central neurological conditions with a child, we are mostly talking about cerebral palsy (CP). Cerebral palsy literally means brain paralysis, which may have arisen during pregnancy, during birth or by an illness during the first year. The disorder mostly refers to the part of the brain that has to do with speech and movement. With CP there are posture and movement disorders and also disorders in sensibility, communication and behavior. By damage of the parts of the brain that control muscle, there may be paralysis which can differ in severeness.

\*aperture: Also called diaphragm, the muscle that forms the boundary between the chest cavity and abdominal cavity. The diaphragm plays an important role with breathing, because the tightening of it changes the size of the chest cavity, at the expense of the abdominal cavity.

\*Breath vocalization: the part of the voice that is produced by breathing.

## Chapter 2

# Physiology and anatomy of a normal respiratory system

### Physiology

The trillions of cells in our body are in constant need of oxygen in order to carry out their vital functions. We can live for a few days without food or water, but can't go for a small period of time without oxygen. If cells use oxygen they release carbon dioxide, a waste that the body has to get rid of. They also generate free radicals, the inevitable by product of a world filled with oxygen.

So the most important function of the respiratory system is providing the body with oxygen and to get rid of carbon monoxide. To realize this function, four processes, collectively labeled respiration, need to happen:

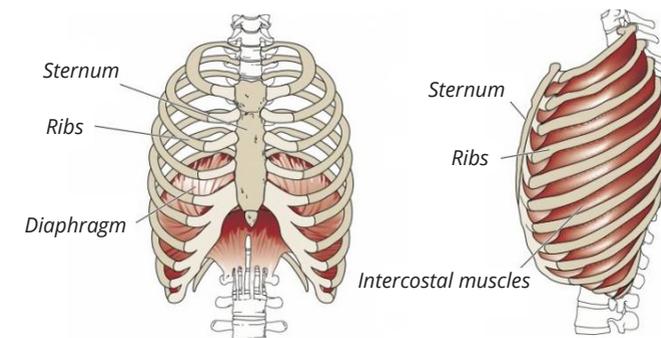
1. **Pulmonary ventilation (mostly referred to as breathing):** The air is moved to and from the lungs, so that gasses continuously change and replace.
2. **External breathing:** Oxygen diffuses from the lungs to the blood and carbon dioxide diffuses from the blood to the lungs.
3. **Transport of respiration gasses:** Oxygen is transferred from the lungs to the tissue cells of the body and carbon dioxide is transferred from the tissue cells to the lungs. The heart and blood vessels accomplishes this by using blood as transportation.
4. **Internal breathing:** Oxygen diffuses from blood to tissue cells and carbon dioxide from tissue cells to blood.

The respiratory system is only responsible for the first two processes, but it can't reach its main goal if the third and fourth processes don't work as they should. The respiration and circulatory system are closely connected, if one of the two processes fails, cells will die due to oxygen deficiency. Because the respiratory system moves air, it is also connected with scent and speech.

### Anatomy

Without help of the respiratory muscles we wouldn't be able to breathe. The most important respiratory muscles are:

- **The Aperture or midriff**  
The midriff is a muscly structure that separates the abdomen from the chest cavity. The aperture is not straight, but arched: It bends upwards. By contraction of the muscle, the midriff is pulled straight (downwards) making the chest increase in volume, the pressure to go down and the air to be sucked in through the mouth and/or the nose. The midriff is responsible for about half of the air that enters the lungs. The intercostal muscles or intermediate rib muscles
- **The intercostal muscles or intermediate rib muscles**  
There are three layers of intercostal muscles: The outer layer increases the volume in the chest cavity by pulling the ribcage upwards. The inner layer pulls the ribs downwards and is used to breath outwards. These muscles are responsible for about a quarter of the air in the lungs when inhaling.
- **The assistive respiratory muscles**  
These are only used by an increased oxygen distress (as with exertion and dyspnea). The most important are the scalenus muscles which go from the neck vertebra to the upper ribs and the musculus sternocleidomastoideus that attaches on the sternum, the clavicle and behind the ear on the skull. The assistives pull the first ribs upwards and increase the volume of the chest cavity.



## Different ways of breathing

### Chest Breathing

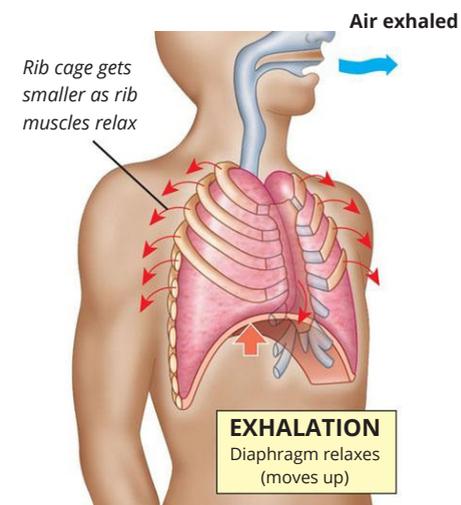
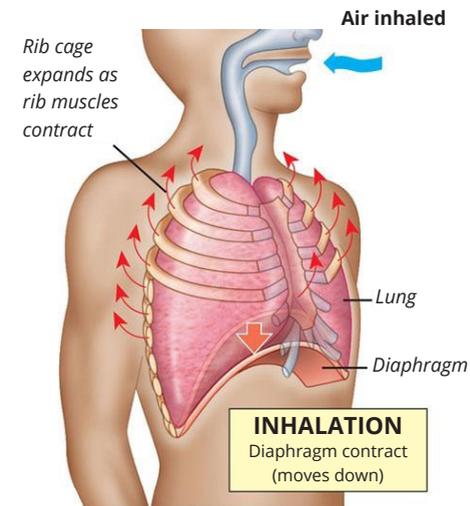
With this form of breathing, the chest cavity moves upwards by inhaling. The ribs and shoulder also move upwards and the back lifts up a little. This form of breathing requires a lot of energy, because many different assistive breathing muscles are utilised. This may lead to higher muscle tension and tiredness. Often this type of respiration is accompanied by quick and superficial breathing. This type of respiration is common with tension, fear and nervousness.

### Abdomen Breathing

Abdomen breathing is also referred to as rest breathing. When you are at rest this way of breathing is most efficient. This is thanks to the diaphragm, a large muscle that runs right through the torso. Above the diaphragm is the chest cavity and below, the abdomen. The diaphragm is arched, when you tense this muscle it flattens downwards. This causes the chest cavity to expand and thus also the lungs. Pressure difference arises and air flows in, and this is what inhaling is. If the diaphragm relaxes again it goes back upwards and you breathe out. When the diaphragm goes downwards the abdominal wall moves along with it, this makes the stomach inflate during breathing. This way of breathing takes little energy.

### Flank Breathing

This type of breathing is efficient, requiring medium exertion, like moving, talking and singing. The ribs and abdomen expand with this type of breathing, which can be felt by placing your hands on the lower ribs. The raising and lowering of your hands as you breathe indicate the exhaling and inhaling, the chest cavity also moves upward slightly during a deep breath. With this way of breathing you use the diaphragm and the intermediate rib muscles.



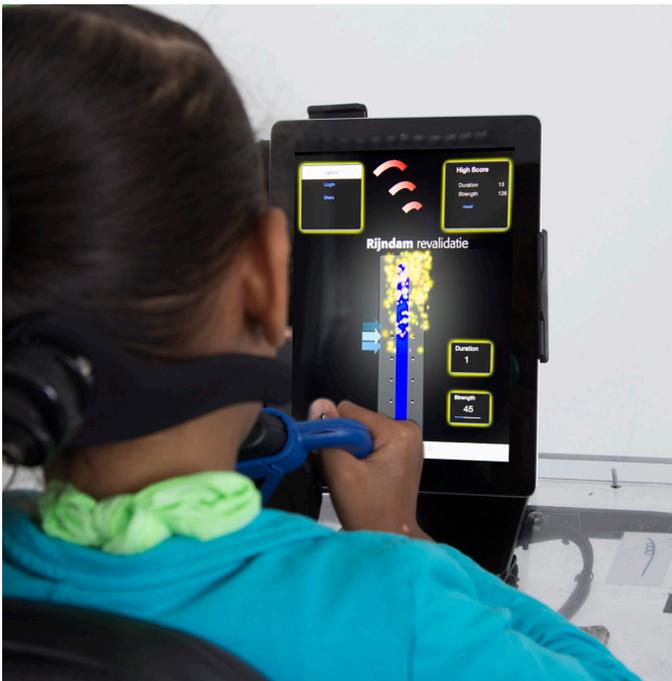
## Chapter 3

# The GroovTube

### What is the GroovTube?

The GroovTube is a unique device which makes breathing and oral motor skills visible and analyzable, while also being entertaining. For people with breathing, speech, or oral motor disabilities it turns their breath into real-time image effects.

The GroovTube is a wireless device: To connect the GroovTube to your iPad, simply turn the device on, and connect to your iPad via Bluetooth. It is simple to use: inhale or exhale into the mouthpiece of the GroovTube, and airflow is recorded and converted into visual effects in an app specially developed for this purpose.



### Why does it help?

For children with a progressive condition, it is important to keep them healthy for as long as possible. With the GroovTube, the child is made aware of their breathing. By breathing in and out against resistance, breathing muscles become trained and developed. It is practically strength exercise for the breathing muscles, which can teach children to breathe independently for long periods.

By practicing with the GroovTube, chances of getting pneumonia greatly decrease. Pneumonia develops when mucus present in the lungs sits, making it easy for bacteria to cause inflammation. When breathing against the resistance that GroovTube provides, a positive pressure in the lungs causes them to open for a longer period of time. This gives air a better chance to flow behind the mucus, making it possible for your child to cough and shift the mucus from the lungs. Another added benefit by training with the GroovTube is an increase in breath vocalization - this is because the muscles are exercised making it possible to produce more energy. A better balance between the usage of these muscles will be generated, provided that the right posture is trained alongside the correct way of breathing.



## Chapter 4

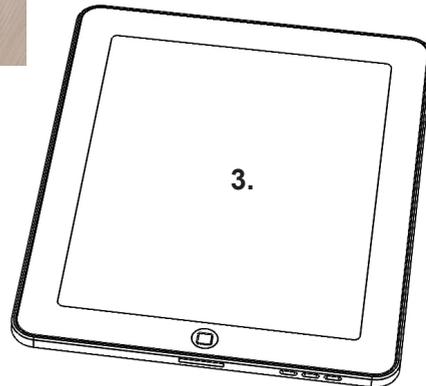
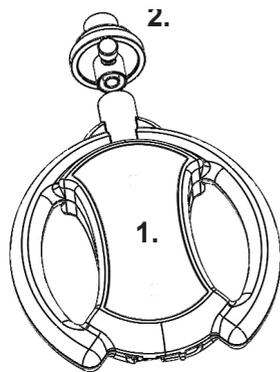
# Using the GroovTube

### The items you'll need:

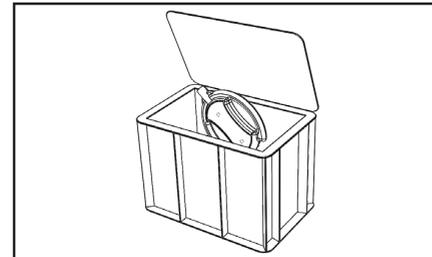
- Fully charged GroovTube
- antibacterial filter mouthpiece
- Manual
- iPad

All these items are included in the starter pack, with exception of the iPad!

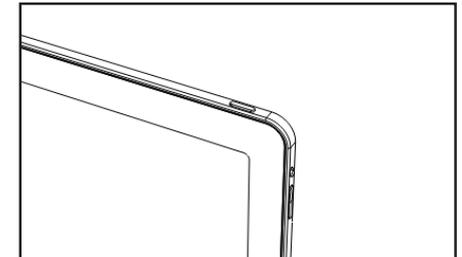
You can buy the starter pack with the link: <http://www.groovtube.nl/>



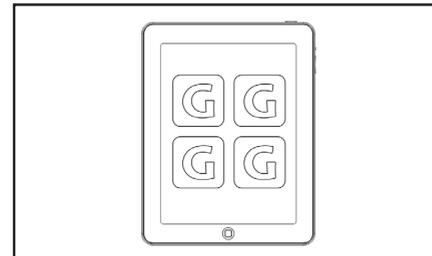
## Quick Start Guide



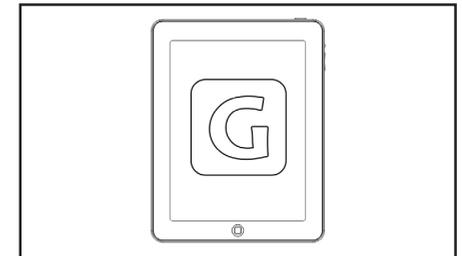
Step 1. Locate and remove the required items from the case.



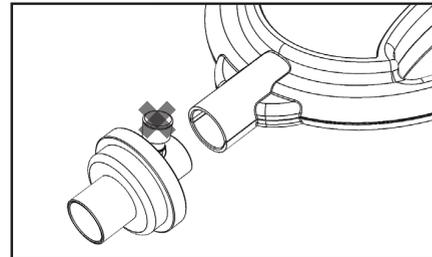
Step 2. Turn the iPad on.



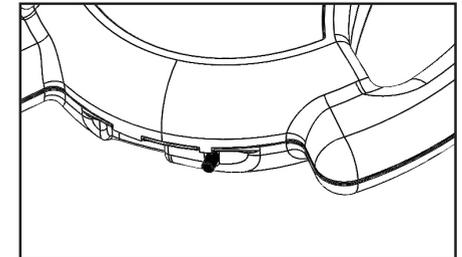
Step 3. Install our apps on your iPad if they are not already installed.



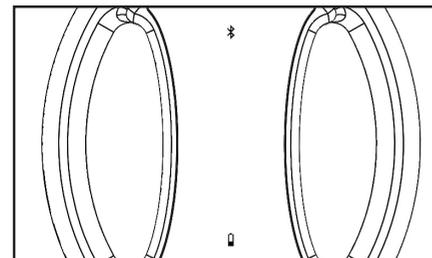
Step 4. Open one of the available GroovTube apps.



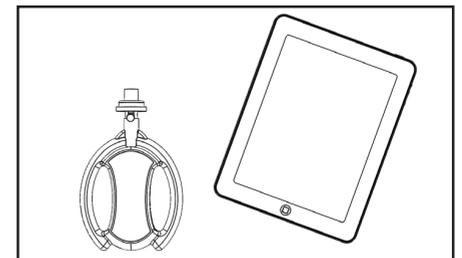
Step 5. Place the antibacterial filter mouthpiece on the white connecting tube.\*



Step 6. Activate the GroovTube using the on-off button on the lower part of the unit.



Step 7. After a few seconds the two LED lights will light up continuously.



Step 8. The GroovTube is now ready for use.

\* = NOTE: make sure you remove the white cap on the antibacterial filter mouthpiece!

## Initial Use

### Connecting the hardware

These steps are illustrated with images on the previous page.

- Step 1. Select and remove the components from the case and prepare your iPad.
- Step 2. Turn the iPad on.
- Step 3. Install our apps on your iPad if they are not already installed and open one of the available apps after the installation is finished.
- Step 4. Activate the GroovTube using the on-off button on the lower part of the unit. The GroovTube will now start calibrating. This will only take a few seconds. You can start using the GroovTube when the two LED lights stop blinking and go steady. You will also hear a signal that the GroovTube is connected. On the iPad the Bluetooth logo will also light up.
- Step 5. The GroovTube is now connected to the iPad and ready for use. Now follow the instructions below.

### Using the GroovTube

When the hardware is connected the GroovTube is ready for use. The apps needed to use the GroovTube are available for free in the App store. You will need to log in with an Apple ID in order to download them. To ensure that the apps function properly it is important that you carry out the following procedure for every use:

- Step 1. Connect the GroovTube to the iPad as described above.
- Step 2. Place the antibacterial filter mouthpiece on to GroovTube. This is done as follows: Please ensure that you wash your hands prior to working with the GroovTube! Avoid touching the front of the mouthpiece with your hands. If you are using an extender mouthpiece on top of the antibacterial filter mouthpiece place this without touching the front or back of it with your hands. Connect it firmly.

NOTE: each user will use his or her own bacterial filter mouthpiece. These can be stored in the supplied plastic containers that have lids. Depending on the requirement of the user you can place an extender mouthpiece on top of the antibacterial filter mouthpiece. Please observe a strict routine of hygiene. The extender mouthpieces are reusable. They can be cleaned with alcohol. For the correct hygiene protocol, see pages 5/6.

- Step 3. Open the app you would like to use.
- Step 4. You are now ready to use the GroovTube.
- Step 5. Open the next app. Turn the GroovTube off and turn it back on. You are now ready to use the GroovTube.

NOTE: when switching between different apps, the GroovTube may not make a proper connection. In this case the two LED lights won't stop blinking. Double-click the Home button (the square on the iPad).

Close all programs (see also page 5) and open the desired app again.

### Turning off the GroovTube and storing it

After each session, close all apps and store the GroovTube in the storage case.

To exit the session please follow this procedure:

- Step 1. Double-click the HOME button (square on the iPad). Swipe the app's screenshot up and off the screen. (Fig. 1)
  - Step 2. Turn the iPad off by pressing the SLEEP / WAKE button for a few seconds. (Fig. 2)
  - Step 3. Turn the GroovTube off.
  - Step 4. Remove the antibacterial filter mouthpiece and store it in the provided container cup, with lid fastened.
- NOTE: Please ensure that the hygiene protocol is followed strictly as described on pages 5/6!
- Step 5. Store all the materials in the storage case.

If you do not use the GroovTube for some time, it will switch itself off automatically.



Fig.1  
Swipe to close apps



Fig. 2  
SLEEP/WAKE

### Charging the battery of the GroovTube

Ensure that you use only the supplied charger for GroovTube! Connect the GroovTube to the supplied AC power adapter. Connect the charger to the GroovTube by inserting the charger plug into input jack. During charging an indication LED on the GroovTube will light up. When charging is complete, this light goes out. If the battery runs down during use, the GroovTube will give a repeating audible tone.

### Keep the battery of the GroovTube in optimum condition

Store and charge your batteries in a cool area. Temperatures above normal room temperature will shorten battery life. The rechargeable battery performs best when it is used regularly. All batteries gradually lose their charge. If you store the GroovTube for long periods of time without using it, recharge the batteries once a month. This practice will prolong battery life.

## The apps

### The different apps

At this current moment there are 7 different apps all for different purposes and target groups. In the App Store these apps are available for free.

Warning! By removing the white cap of the GroovTube the level can be adapted. Without the cap the exercises become more challenging. So always be aware if your child always trains without a lid because it can influence the scores.

### GroovTube app

By breathing in and out through the GroovTube you can change and warp the chosen image. In the menu labeled "pick photo" you can choose an image from your image library, this allows you to use your own photos or downloaded images from the internet.

In the 'settings' menu you can add an effect you wish to use on the image. By pressing the 'inhale/exhale' button the direction of the breath can be chosen. The lever can be altered through the menu 'settings' by sliding the threshold button higher or lower.



### Fair Hammer app

The first time you play Fair Hammer you need to create a username. For this you go to the upper left of the screen, press log in, and type your name and password and press sign in. Under this username your scores will be saved from every time you have trained. The Fair Hammer app is based on the game "highstriker". The purpose of this app is to fill up the vertical bar as much as possible. The power of the inhale or exhale will determine the score on the meter. A difficulty lever can be moved up or down in the settings, with options ranging from "low" to "very high". By pressing inhale or exhale you can change the direction of the breath. On the upper right of the screen you can find the high score of the training.



### Billiard Breath App

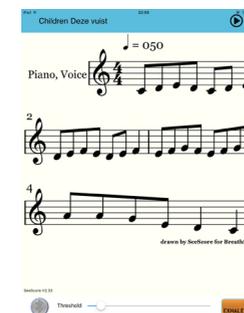
This app has three modes: Sequence, Duration and Power. The aim of this game is for the user to move the balls using their breath strength and agility, this helps raise the awareness of breath. In the Sequence mode the user has to puff shortly and briefly - this mode is used to train rhythmic breathing. In the Duration mode you can train the length of your breath - in this mode the balls jump up one by one, as long as the user keeps breathing in or out. In the Power mode you can train strength - in this mode the aim is to get the balls to move upwards all at once by breathing in or out with as much power as possible. With all these modes the level can be altered with the button on the lower right; the options can be shifted between low, medium and high. The scores of 'duration' are saved in a data sheet.



### Breath Music app

The Breath Music app has a few different modes where they combine fun, music and breath training. There are two modes within this app: Scale and Song.

Scale: Select a tone scale and an instrument, breath in or out to make your own melody. Song: Pick a song you want to use and discover if you have enough air to play the song in one breath.



### BreathScore app

BreathScore is a game where, through music, you can improve the rhythm of your breathing. Improving the rhythm of your breath has a positive effect on speech due to control being practiced. First you pick a song, in the upper left corner of the screen. Then you listen to the song in full by pushing the play button on the upper right corner. From there the

aim is to reproduce the song note by note by blowing. Every time you blow, the next note of the song plays. At the bottom of the screen you can alter the "Threshold", which adjusts the reaction sensitivity. A high Threshold means you have to blow harder. You can also adjust the setting to choose between inhale and exhale.

## Breath Trainer app

The aim of this game is to help a bicyclist ride up a hill through a combination of breath strength and duration. There are three different modes;

- Endurance: the duration is tested and the cyclist has to travel a certain distance.
- Strength: the strength is practiced and the cyclist has to ride up a hill.
- Endurance & strength: A combination of these two previously mentioned modes.

The training can be done at one of the four user levels: 'low', 'medium', 'high' and 'very high'.

Before training with this app, it is advisable to go by the following steps:

Step 1: Choose the right level of the user

1. Choose a mode
2. Choose the right breathing direction (inhale or exhale)
3. Choose the lowest level ("low") and do a test ride.
4. Is it too easy? Choose a higher level ("Medium") and repeat the test ride
5. Still too easy? Choose a higher level again ("High"). If not then this is the right level to train.

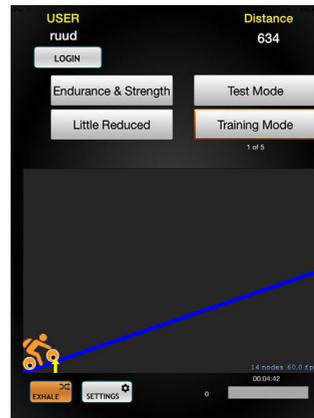
Step 2. Test mode

Select the button "test mode" and breath in or out at maximum capacity.

Step 3. Training mode

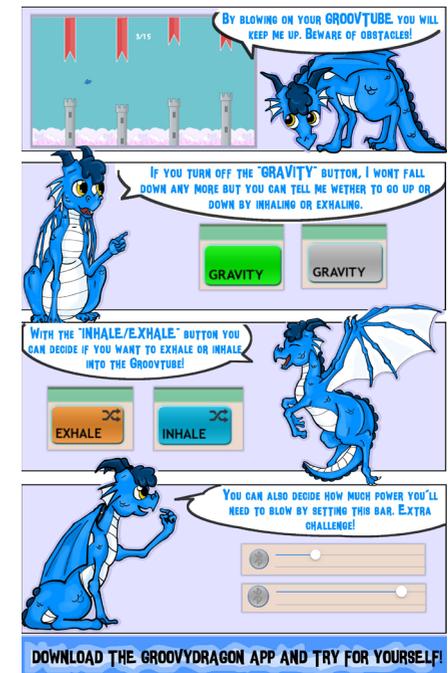
1. select the button "Training Mode" and choose how many times the exercise needs to be repeated (3-30 times)
2. Start the exercise. During practice you can try a certain percentage at maximum capacity.

**Tip:** When you train with the Endurance mode, you repeat this until 30 at maximum. When you train Endurance and Strength you repeat that 15 times at maximum. When you train Strength you repeat 8 times at maximum. The exercises are most effective without the white cap on the antibacterial filter mouthpiece. But to users with most extreme limited lung capacity it's best to use it with the white cap.



## Groovy the Dragon

In this game you help control a little dragon fly through obstacles by breathing in or out. The game has five levels. Adjustable: inhale or exhale, level and gravity on/of (to make the game more challenging for experienced users).



## Posture in three situations

A good posture is the basis for good breathing. For a good posture a balanced muscle tension is vital: A bent posture results in an inefficient way of breathing, as can over tensing your muscles or tensing the wrong muscles - For example when you sit with raised shoulders or tense your abdominal wall too much.

While practicing with the GroovTube it is important that the child is sitting straight, and abdominal breathing / flank breathing is used during practice. Abdominal and flank breathing are described in Chapter 2.

### 1. No support

Children who don't need extra support can hold the GroovTube themselves and have the right muscle tension to keep themselves upward and sitting. It is important that the child is sitting straight correctly and the GroovTube is used directly in front of the iPad. This way the iPad is also directly in front of the child. If possible, it is important that the chair and table are adjusted to the correct height so the child won't experience neck problems.



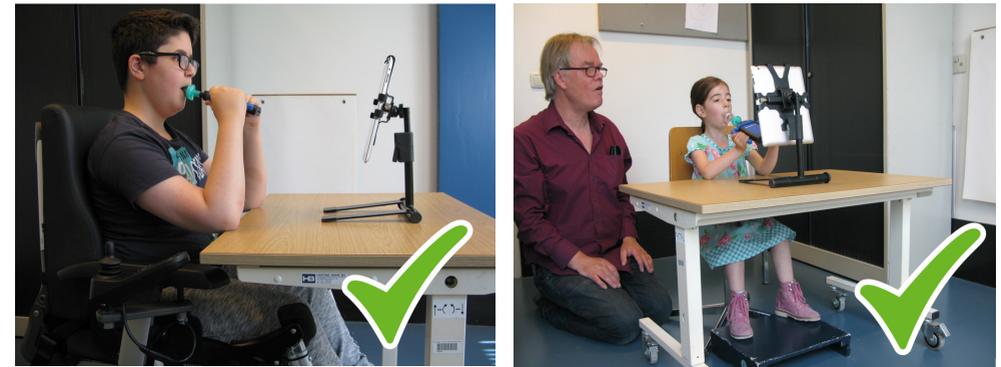
*In this picture you see a correct posture. This boy is sitting straight and has the iPad in front of him.*



*Example of a bad posture*

### 2. Minimal support

A child who needs minimal support can use the GroovTube themselves, but it can be comfortable to support yourself, for example by resting elbows on the table. Results from different researches show that a specific bent posture can bring the aperture in a lengthened position, so more energy can be generated and the respiratory muscles get the chance to deliver a larger support to the elevation of the rib cage. In this way it is possible to decrease the sensation of breath shortage and enable a maximum use of the assistive respiratory muscles.

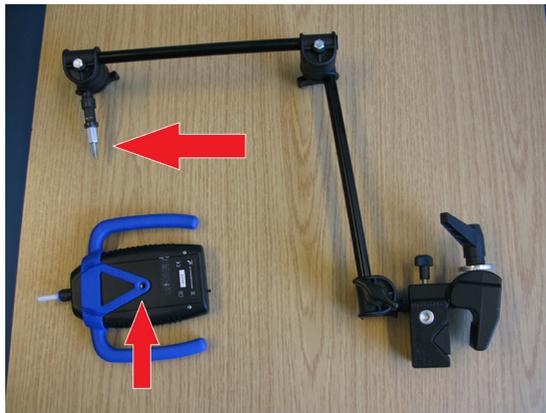


*In these two pictures you see a correct posture where the child is using little support. In the second picture you see how the child is being supported by a foot bench so she has a straight posture.*

Just like other postures, is it necessary to place the GroovTube and the iPad directly in front of the child. Due to the posture where the elbows are leaning on the table it might be necessary to adjust the table and/or chair. As well as this it is important to place the iPad so that the child does not have to look downwards by bending their neck. For children in a wheelchair it is important to place the chair straight up, with brakes on.

### 3. Complete support

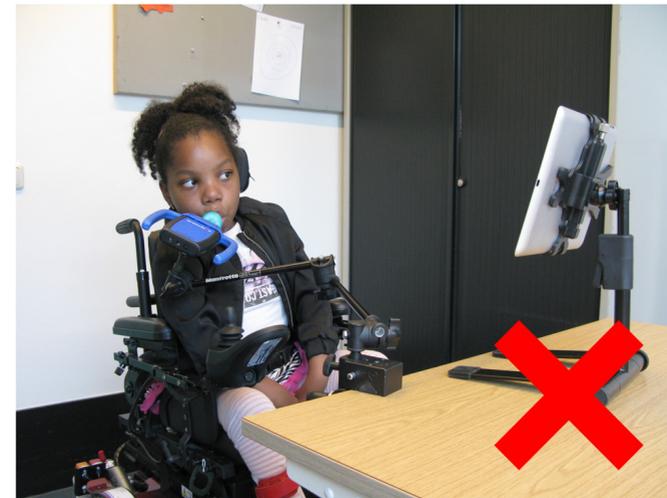
A child that needs full support, is not capable of holding the GroovTube by themselves. It is necessary to get a stand with a table clamp to use with the GroovTube. These are available via our website. The stand makes it possible for the GroovTube to be adjusted to the right height so the child isn't required to hold the device themselves. Also it is important that there is a proper distance between the device and the child. The child should not be leaning forward but there has to be space to remove the GroovTube from the mouth independently. With this it is important that the stand is adjusted correctly and adapted to the height of the iPad, as well as the sitting posture of the child. For children in a wheelchair it is necessary to place the wheelchair straight up, with the brakes on. This way the child can work effectively with the GroovTube.



*In this image you can see a stand with table clamp. You can connect the GroovTube to this stand by turning the screw of the stand into the nut of the GroovTube.*



*The child makes use of the stand and is thus in need of full support. The child is sitting up straight and has the iPad right in front of her.*



*This is an example of bad posture, the child has to rotate to use the GroovTube and cannot use the respiratory muscles optimally.*

## Measuring with the GroovTube

### *Measuring is knowing!*

Measuring is an important part of the therapy because this way the progress or regress of the user can be mapped. By using certain apps you can measure with GroovTube, it's best to do this weekly so there can be a regular record. By doing a test before every training, a good picture can be painted of how well the training is going.

### **Fair Hammer app**

With the 'Fair Hammer' app you can measure the pressure of the blowing. This can be tested before the training begins:

It is useful to write down the values on for example the worksheets in the back of this manual.

Step 1: If possible, remove the cap from the mouth piece

Step 2: In the app 'Fair Hammer' there is a panel on the upper right called 'high score', reset this by placing it on zero

Step 3: Blow a few times to attempt to beat the High Score. This can be based on inhale and/or exhale. This can be set using the button on the lower left.

Step 4: Blow as fast as you can, in or out. After blowing there will be a 'Strength' measured. The Strength gives a relative value from 0-124. 0 is very weak and 124 is very strong. The 'Strength' is more a value to guard how measuring with breathing goes (this is not to be connected with values of the measuring tools, which measure breath properly). These values are purely meant to indicate how well training is going; if it is stable or if it is progressing/regressing.

### **Billiard Breath app**

The 'Billiard Breath app' can measure the duration of an inhale or exhale. This can also be tested before the training begins:

Step 1: Again, if possible, remove the cap from the mouth piece

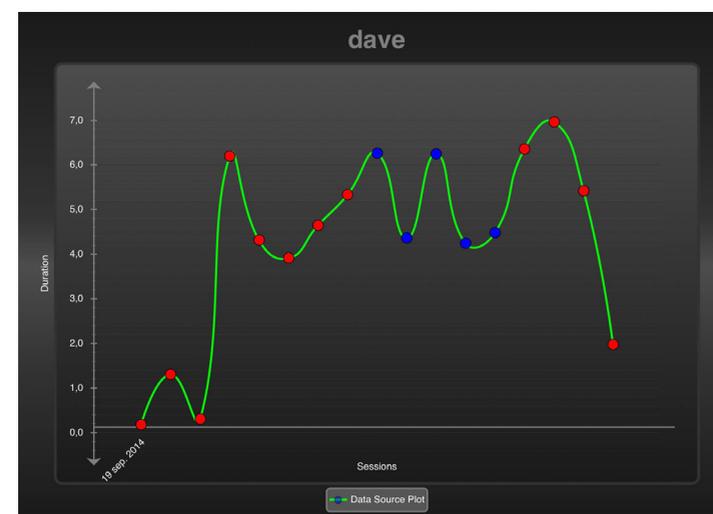
Step 2: Inhaling and exhaling is set with the button on the lower left, beside this there are is the button 'Mode', which you will to 'Duration'.

Step 3: Try to blow. With 'Difficulty' on the lower right of the screen you can set a level to the training.

This app saves the values and places it in a graph. This graph can be found through the button above: 'Users' and through the tab: 'Data Source'. In here you can see all the results of the previous sessions. The red points show the scores of the exhalation and the blue points are the inhalation. On the left side of the graph is a scale that shows the length of the breath. On the bottom of the graph is the sequence of attempts.

### **Breath Trainer app**

With the Breath Trainer app the power and duration are measured. With this app you can train endurance and/or strength. At the top are 4 big buttons, by pressing the button on the upper left you can chose between the modes of training: Strength, Endurance, and a combination of these two. By testing first at the start of the training you can create a clear overview for where the child is at this moment. This test can be activated by pressing the big button on the upper right. The inhalation or exhalation can be set with the button on the lower left of the screen. Next comes the training: The exercises can be done on the percentage of the maximum reached score from the test. This is described in Chapter 4.



## Chapter 5

# Training principles

FITT stands for 'Frequency, Intensity, Type and Time'. The 'Frequency' being how often you train, 'Intensity' for how intensive your work-outs are, 'Type' for what kind of exercise you are going to do and 'Time' for the length of your work-out. Because FITT can be suited to your child's individual goals, the PEP-mask\* fits well with the program.

Before you start training with your child it is important to discuss with your physiotherapist which scheme your child is going to start. The physiotherapist will determine your child's current lung capacity and potential and adjust the scheme accordingly.



\*"Positive Expiratory Pressure"- mask: A mask where you can breathe in normally and where the exhalation goes through a small hole, thereby increasing resistance and pressure within the lungs. This can make coughing up phlegm easier.

### Frequency, intensity and time

The success of the training is dependent on the duration of the session and the frequency of the session per week. It is very important to establish a regular routine with the child, (think about times after dinner, on Wednesday afternoon, or a morning in the weekend). The minimum training frequency is twice a week with a minimum of 20 minutes per session. When your child can keep this up with ease, make the intensity stronger or practice more days in the week. A training session can also be extended to 30-45 minutes. Is it too much for your child? You could divide the training over the day in segments of 10 minutes.

### Activity type

The activities are conducted with the Groovtube by using the different apps.

*Tip: Try to do the exercises when your child has most energy.*

*Tip: Is your child asthmatic? Use their inhaler before practice.*

You can write down and keep track of the results of the training in the back of this manual.



## Chapter 6

# GroovTube in combination with the PEP-mask

### What is PEP?

PEP stands for Positive Expiratory Pressure. The PEP-mask gives resistance when exhaled into so pressure is built up inside the lungs.

The PEP-mask is used by placing the mask over the mouth and nose of your child. Inhalation goes freely through one opening of the mask and exhalation through the other smaller opening. This smaller opening offers resistance, causing less air to be exhaled and more of it to be retained inside of the lungs. This gives a positive pressure in the lungs and keeps the airways open a little longer. Because more air is left in the lungs it can get behind the phlegm more easily and the phlegm can be moved with a power breath. During pepping you try to keep the length of inhalation and exhalation the same.

### For whom?

The combined use of the PEP-mask with the Groovtube is possible for every child who is already using the Pep-mask. The Groovtube is mainly useful for children with a low cognitive level. By using the GroovTube in combination with the PEP-mask children understand quicker what they are supposed to do because they are guided with visuals on the iPad.



*In this image you see a Groovtube connected to the PEP-mask.*

### Set up + installation

To install the Groovtube on the PEP-mask do the following steps:

- Step1: Connect the filter to the PEP-mask
- Step2: Place the adapter piece to the filter
- Step3: Put resistor on the adapter piece
- Step4: Open the Groovtube app
- Step5: Turn on the Groovtube
- Step6: Wait for connection
- Step7: Place the PEP-mask over the mouth.

### Practicing with the GroovTube and the PEP-mask

When practicing with Groovtube and the PEP-mask the posture of the child is important. Make sure they are seated as upright as possible, and place the iPad so the child can look straight ahead. When a game is chosen, the PEP-mask is placed over the mouth of the child. Next the child breathe against the pressure and practices breathing this way.



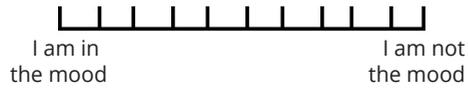


Name: ..... Date: ..... - ..... - ..... Time: .....

**Did you want to exercise today?**



**How do you feel?**



**TEST(reset High score before every attempt!)**

Highscore Fair Hammer

EXHALE		INHALE	
Attempt 1	.....	Attempt 1	.....
Attempt 2	.....	Attempt 2	.....
Attempt 3	.....	Attempt 3	.....

Highscore Billiard Breath

EXHALE		INHALE	
Attempt 1	.....	Attempt 1	.....
Attempt 2	.....	Attempt 2	.....
Attempt 3	.....	Attempt 3	.....

Breath Trainer

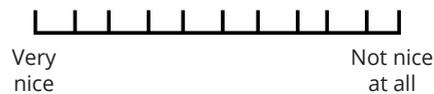
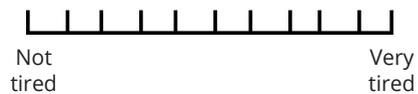
EXHALE	distance	difficulty	X*	INHALE	distance	difficulty	X*
Endurance	.....	.....	.....	Endurance	.....	.....	.....
Endu/strength	.....	.....	.....	Endu/strength	.....	.....	.....
Strength	.....	.....	.....	Strength	.....	.....	.....

\*X number of repetitions

**How are you after training?**



**What did you think of the training ?**



**Which apps have been used?**

- Groovtube app
- Breathscore app
- Fair Hammer app
- Breath Trainer app
- Billiard Breath app
- Groovy the Dragon
- Breath Music app

**Is the training with or without the white cap?**  With cap  Without cap

**Duration of the training:** ..... minutes

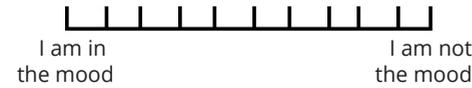
**Additional comment:** .....

Name: ..... Date: ..... - ..... - ..... Time: .....

**Did you want to exercise today?**



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Highscore Fair Hammer

EXHALE		INHALE	
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Highscore Billiard Breath

EXHALE		INHALE	
Attempt 1	.....	Attempt 1	.....
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Breath Trainer

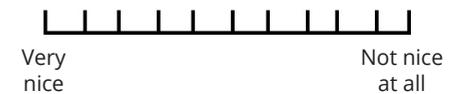
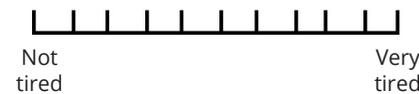
EXHALE	distance	difficulty	X*	INHALE	distance	difficulty	X*
Endurance	.....	.....	.....	Endurance	.....	.....	.....
Endu/strength	.....	.....	.....	Endu/strength	.....	.....	.....
Strength	.....	.....	.....	Strength	.....	.....	.....

\*X number of repetitions

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**Is the training with or without the white cap?**  With cap  Without cap

**Duration of the training:** ..... minutes

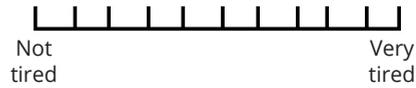
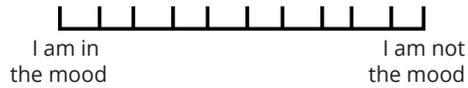
**Additional comment:** .....

Name: ..... Date: ..... - ..... - ..... Time: .....

**Did you want to exercise today?**



**How do you feel?**



**TEST(reset High score before every attempt!)**

Highscore Fair Hammer

EXHALE	.....	INHALE	.....
Attempt 1	.....	Attempt 1	.....
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Highscore Billiard Breath

EXHALE	.....	INHALE	.....
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Breath Trainer

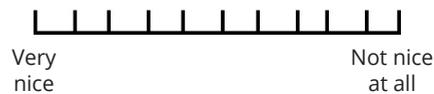
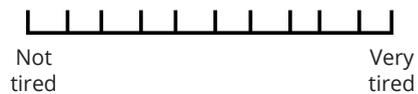
EXHALE	distance	difficulty	X*	INHALE	distance	difficulty	X*
Endurance	.....	.....	.....	Endurance	.....	.....	.....
Endu/strength	.....	.....	.....	Endu/strength	.....	.....	.....
Strength	.....	.....	.....	Strength	.....	.....	.....

\*X number of repetitions

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**What did you think of the training ?**



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**Is the training with or without the white cap?**  With cap  Without cap

**Duration of the training:** ..... minutes

**Additional comment:** .....  
.....

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# groovtube

The GroovTube was developed at the initiative of Rijndam Rehabilitation Institute, in collaboration with the assistive technology company AudioRhoon.

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**Rijndam**  
Revalidatie



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