

World class respiratory care devices for  
clinical use and patient homecare



# POWERbreathe Respiratory Muscle Training - The Drug Free Solution

POWERbreathe RMT/IMT Class 1 Medical Devices are advanced pressure threshold loading devices that are drug-free, have no side-effects or drug interactions and are clinically proven to be beneficial for the following medical conditions.

## COPD

**The most up to date systematic review on Respiratory Muscle Training from 2011:-**

**Impact of inspiratory muscle training in patients with COPD: what is the evidence?**

R. Gosselink, J. De Vos S.P. van den Heuvel, J. Segers, M. Decramer, G. Kwakkel

“IMT improves inspiratory muscle strength and endurance, functional exercise capacity, dyspnoea and quality of life. Inspiratory muscle endurance training was shown to be less effective than respiratory muscle strength training. In patients with inspiratory muscle weakness, the addition of IMT to a general exercise training program improved PI max and tended to improve exercise performance”.

POWERbreathe IMT has been widely used in patients with COPD as a standalone therapy or for pulmonary rehabilitation.

**In randomised controlled trials, IMT has also been shown to deliver:**

- Improvements in quality of life by 21% (Beckerman et al 2005)
- Improvements in dyspnoea by 36% (Beckerman et al 2005)
- Reduction in primary care consultations by 23% (Beckerman et al 2005)
- POWERbreathe training is 10 times more effective than oxitropium bromide for improving exercise tolerance and quality of life in patients with COPD (Oga et al., 2000; Beckerman et al., 2005).

## Heart Failure

POWERbreathe IMT is clinically proven and beneficial for patients with heart failure and heart disease as a standalone therapy or for cardiac rehabilitation.

In patients with chronic heart failure, IMT has been shown to:

- Improve exercise tolerance by 19% (Laotaris et al 2004 and Dall'Ago et al 2006)
- Improve quality of life by 16% (Laotaris et al 2004 and Dall'Ago et al 2006)

Because the cardiovascular strain of POWERbreathe training is very low, it is suitable for even the most physically compromised patients, and is particularly helpful in patients who are too ill for rehabilitation.

## Asthma

POWERbreathe IMT is clinically proven and beneficial for patients with asthma to help reduce inhaled therapies, for exercise induced asthma and for improvements in exercise.

Laboratory studies found:

- Asthma symptoms improved with IMT by up to 75% in 3 weeks (McConnell et al 1998)
- Patients with asthma experienced improvement of symptoms, quality of life and a reduction in the consumption of medication of up to 79% (Weiner et al 1992)

## POWERbreathe for other conditions where dyspnoea is present

Because POWERbreathe IMT influences dyspnoea directly at a cortical level, it is also helpful in managing other conditions where dyspnoea is present, including:

- Elderly people
- Neuromuscular disease
- Parkinson's disease
- Prior-polio
- Spinal cord injury
- Sleep apnoea
- Exercise-induced paradoxical vocal chord dysfunction (VCD)

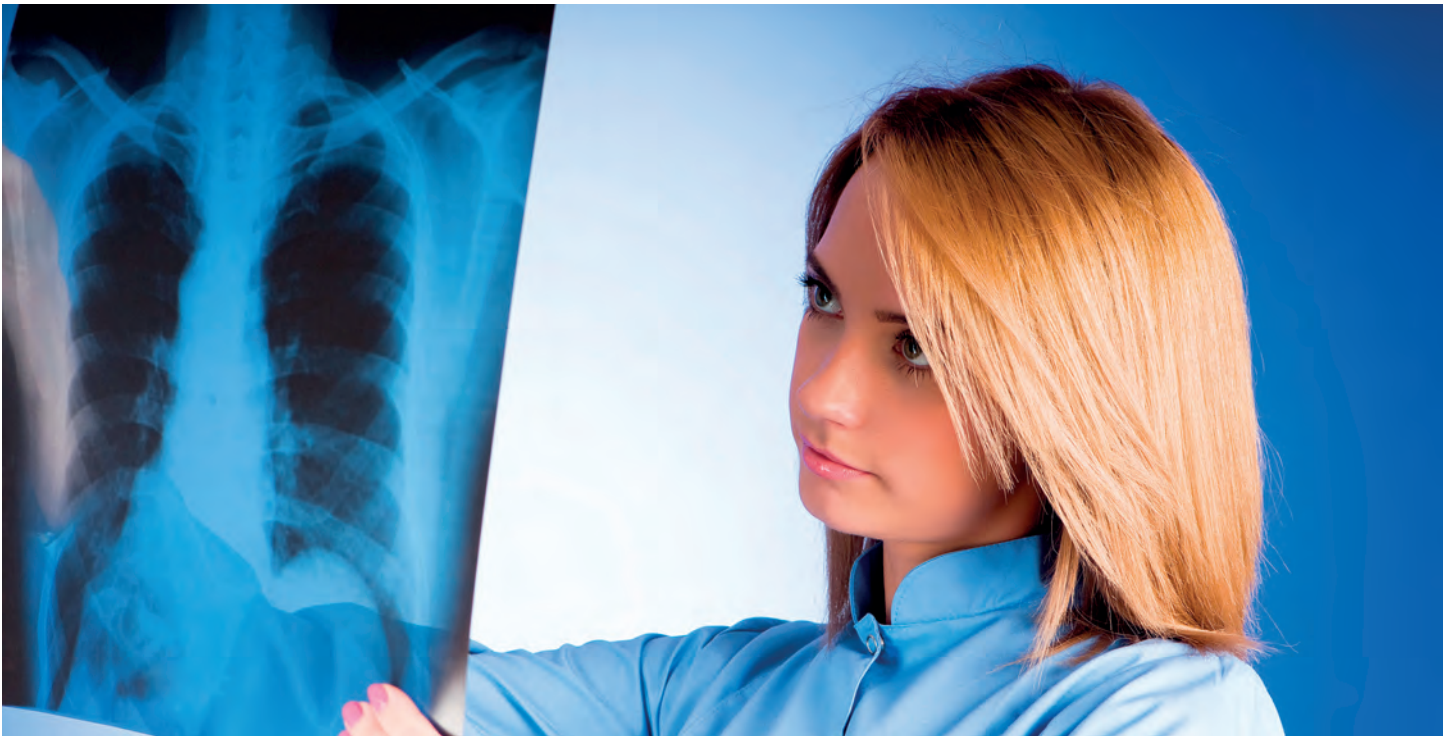


POWERbreathe  
Medic  
is available  
through the NHS  
PIP Code:  
232-1040

**Drug free, evidence based  
and clinically proven**

Visit: [powerbreathe.com](http://powerbreathe.com) for research references





## How POWERbreathe Respiratory Muscle Training works

**In much the same way as you might use weights to increase arm muscle strength, POWERbreathe RMT/IMT devices strengthen lung muscles by creating a resistance against the in-breath.**

Training in this way means that even patients who cannot walk can increase the strength of their lung muscles, improving general breathing during periods of recovery and improving QoL in patients with the symptoms of diseases such as COPD, asthma and cystic fibrosis.

All POWERbreathe RMT/IMT models use the same advanced principles of pressure threshold training.

Mechanical models use a calibrated variable resistance spring. The valve is only released when the patient creates enough pressure to open the valve at the pre-set pressure.

POWERbreathe KH-Series models use patented electronic variable pressure threshold valve technology for optimum performance.

The more resistance, the harder the muscles work but it is important to maintain full volume, diaphragmatic breaths before gradually increasing the level of resistance.

With nearly 20 years of research and the POWERbreathe devices being used by Healthcare / Medical practitioners, as well as, Sports and Fitness Professionals, their exceptional performance has resulted in positive user outcomes making POWERbreathe the Gold Standard in RMT/IMT.

The POWERbreathe Medic model is available for prescription through the NHS if on the local formulary.

Key benefits include:

- Drug Free, Class 1 Medical Device - no side effects or drug interactions
- Simple and easy to use
- Various protocols depending on patient type. 30 breaths, twice a day at 40% of MIP being standard
- Increase in quality of life
- Low cost to NHS budgets
- Potential of significant on-going savings due to the reduction of the patients dependence on medication



**Can be implemented as either a standalone intervention or as part of a rehabilitation programme**

# POWERbreathe KH-Series, the world's most advanced intelligent breathing improvement training system.

Originating from the same breathing training concept as the mechanical series, the innovative and patented electronic POWERbreathe KH-Series delivers superior breathing training experience and results. The KH-Series has been designed specifically for use by healthcare professionals for inspiratory muscle training and assessment in patients with dyspnoea, including patients with asthma, COPD, bronchitis, cystic fibrosis, emphysema, heart disease, neuromuscular disease and Parkinson's disease.

POWERbreathe KH-Series devices are suitable for use in clinic, as well as, bedside on the ward or in the homecare environment.

POWERbreathe KH-Series devices are also multi-user due to the unique replaceable header valve design or via disposable filters.

When breathing in, the lung muscles start to lose strength. The POWERbreathe Plus and Classic models are set at a single and adjustable resistance which means the user will not be able to breathe past a certain point. This leaves a significant proportion of each breath wasted (see chart). To overcome this limitation, the intelligent KH-Series reduces the resistance towards the end of the in-breath allowing the lung muscles to be exercised throughout the entire breath.

Modifications and technological advances applied to the KH-Series include:

- Precise measurement of respiratory pressure and flow at 500Hz per second
- Micro-adjustments to the valve and training load at 4,000Hz per second

The precision technology above offers:

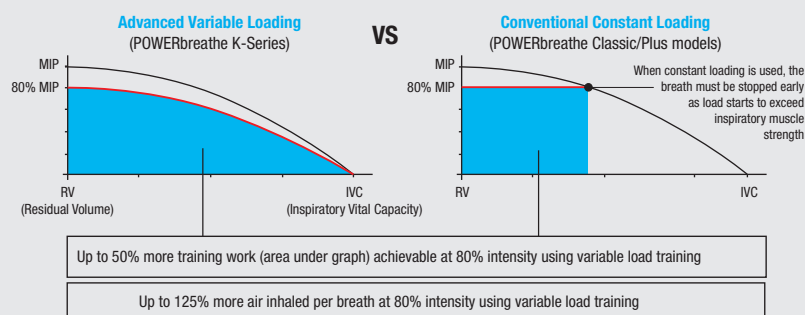
- A match of the contractile profile of the diaphragm and provides up to 50% more training work at 80% of maximum inspiratory pressure
- Advanced Electronic Variable Resistance
- A wide range of testing capabilities including MIP, PIF and S-Index Test Functions
- Multi-User Option
- KH2 Breathe-Link Medic live feedback software
- There are healthcare professional and patient dedicated models available in the KH-Series (see pages 16 & 17)

*"We have achieved fantastic results by using this device as the step between breathing retraining and formal pulmonary rehabilitation."*

**Kate Martin**

Therapy Team Lead / Clinical Specialist  
NHS BreathingSpace Hospital, Rotherham, UK

The POWERbreathe K-Series creates a variable load which matches the length tension relationship of the inspiratory muscles allowing more effective training than conventional constant load training.



Major 6 Nation Multi-Centre COPD study concludes that POWERbreathe KH-Series performance matches "Gold Standard" clinical laboratory system. (PubMed - PMID: 23421970)

**The ultimate portable hand-held device for testing, monitoring and analysing any Respiratory Muscle Training programme.**





**KH2** WITH **BREATH+ELINK™**  
**MEDIC** • LIVE FEEDBACK SOFTWARE

**Designed and developed for healthcare professionals**

The NEW POWERbreathe KH2 includes several innovative features including MIP, PIF and S-Index test functions, allowing practitioners to collect patients' training data via the portable hand held KH2 device.

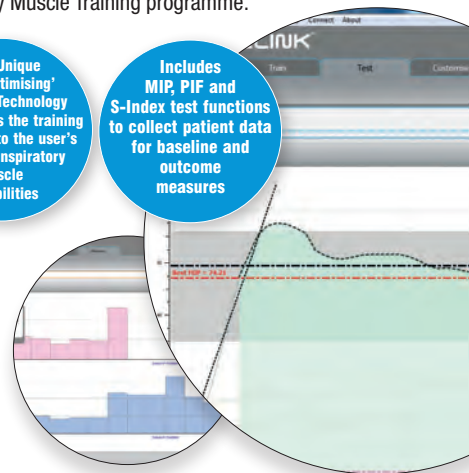
The advanced KH2 model allows the results to be viewed in real-time using the revolutionary Breathe-Link Medic software.

Development of the POWERbreathe KH-Series advanced electronically controlled valve allows average load, power and inhaled volume to be viewed instantly.

The POWERbreathe KH2 is the ultimate device for testing, monitoring and analysing any Respiratory Muscle Training programme.

Uses Unique 'Auto Optimising' RMT/IMT Technology which adapts the training resistance to the user's personal inspiratory muscle capabilities

Includes MIP, PIF and S-Index test functions to collect patient data for baseline and outcome measures



**Advanced Smart Breathing Training Features Include:**

- Auto IMT
- Training Intensity
- Training Guidance
- Endurance Programme
- Training Results
- Breathing Energy
- Strength Index
- MIP PIF RMT
- Washable Valve
- Rechargeable
- Multi-user Filter Option
- Breathe-Link Software
- Breathe-Link Pro-View
- Breathe-Link Custom
- Breathe-Link Patient Data

See page 16 & 17 for a full description of the KH-Series Smart Breathing Training features or visit [powerbreathe.com](http://powerbreathe.com)

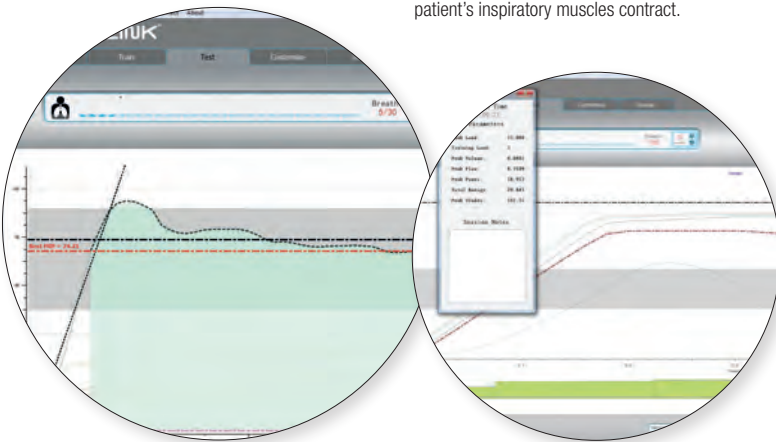
## Train, test, record and analyse

### Test Modes

#### MIP Test with Breathe-Link Medic Software

**Maximum Inspiratory Pressure (MIP)** test. A test that measures the strength of the muscles used in breathing.

Real-time / Live feedback provides healthcare professionals detailed analysis of each breath to help respiratory and pulmonary rehabilitation assessment.

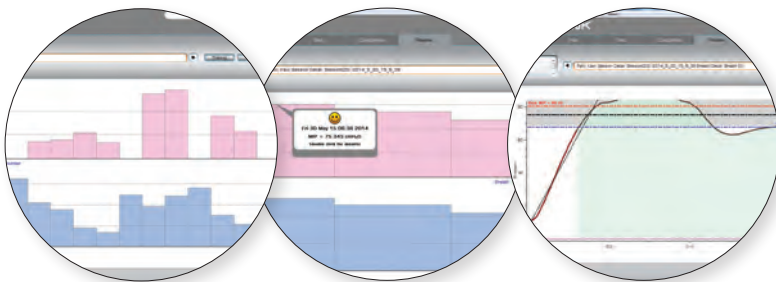


**New feature**

To ensure accurate and repeatable MIP results, the **POWERbreathe KH2 Breathe-Link Medic software has introduced the QC MIP mechanism.**

The maximum 1 second average value of 3 manoeuvres that vary by less than 20% is recorded.

### Test Results



#### MIP Test Results with Breathe-Link Medic Software

##### Results Level 1

Multi-Level Analytic Review System to monitor patient progress and help assess respiratory muscle conditions

Level 1: Session by Session graphical view of historical tests.

##### Results Level 2

Breath by breath detail of tests performed is recorded allowing healthcare professionals the ability to identify trends and improvements.

##### Results Level 3

Individual breaths in a session can be assessed.

### Live Training Modes

#### Breathe-Link Medic Basic View Live

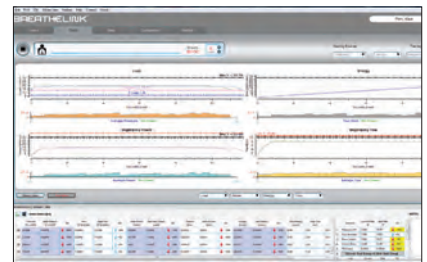
**Graphical view** of major breathing parameters to easily assess and encourage patient training performance. The goal is to maximise training performance against personal bests. Proven to increase user compliance of training regime.



#### Breathe-Link Medic Professional View Live

**Professional view** of major breathing parameters to easily assess and encourage the patient's training performance.

Analyse a training session breath by breath in real-time. Major breath parameters are plotted in real-time which include Power, Energy, Pressure and Flow.



*"The KH2 allows the professional to map the patients progress and also motivates patients through the visual feedback."*

**Kate Martin**

*Therapy Team Lead / Clinical Specialist  
 NHS BreathingSpace Hospital, Rotherham, UK*

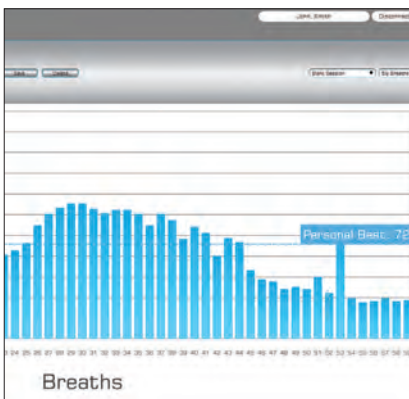
## Custom Training

### Simple Click and Drag System

Breathe-Link Medic Software offers a simple, easy to use, interactive environment which allows you to adjust the setting for each breath by simply clicking and dragging the bars on screen.

Allows professionals to create personalised training sessions to optimise patient training.

Flexibility to change the patient's training load for each individual breath.



## Training Results

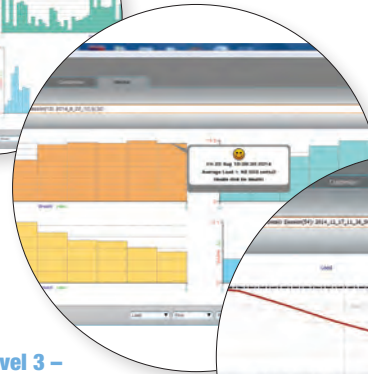
### Train Results Level 1 – Session Detail

Multiple parameters displayed as histograms



### Train Results Level 2 – Breath by Breath Detail

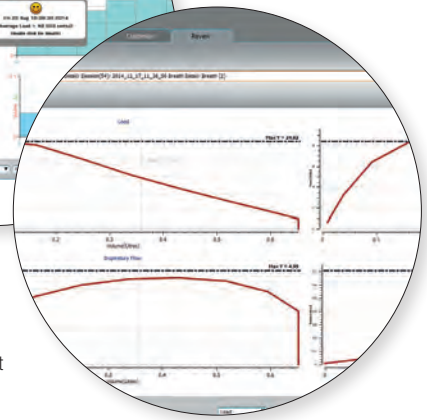
Multiple parameters displayed as histograms



### Train Results Level 3 – Individual Breath Detail

Linear graphs of major respiratory parameters for every breath within a session.

Healthcare professionals have the ability to assess in detail respiratory changes that can affect patients breathing.



## Patient Data

### Breathe-Link Medic Patient Lists

Integrated patient view showing all registered patients on the Breathe-Link Medic software. The Patient View master control panel allows you to easily access and navigate patients RMT/IMT training data.

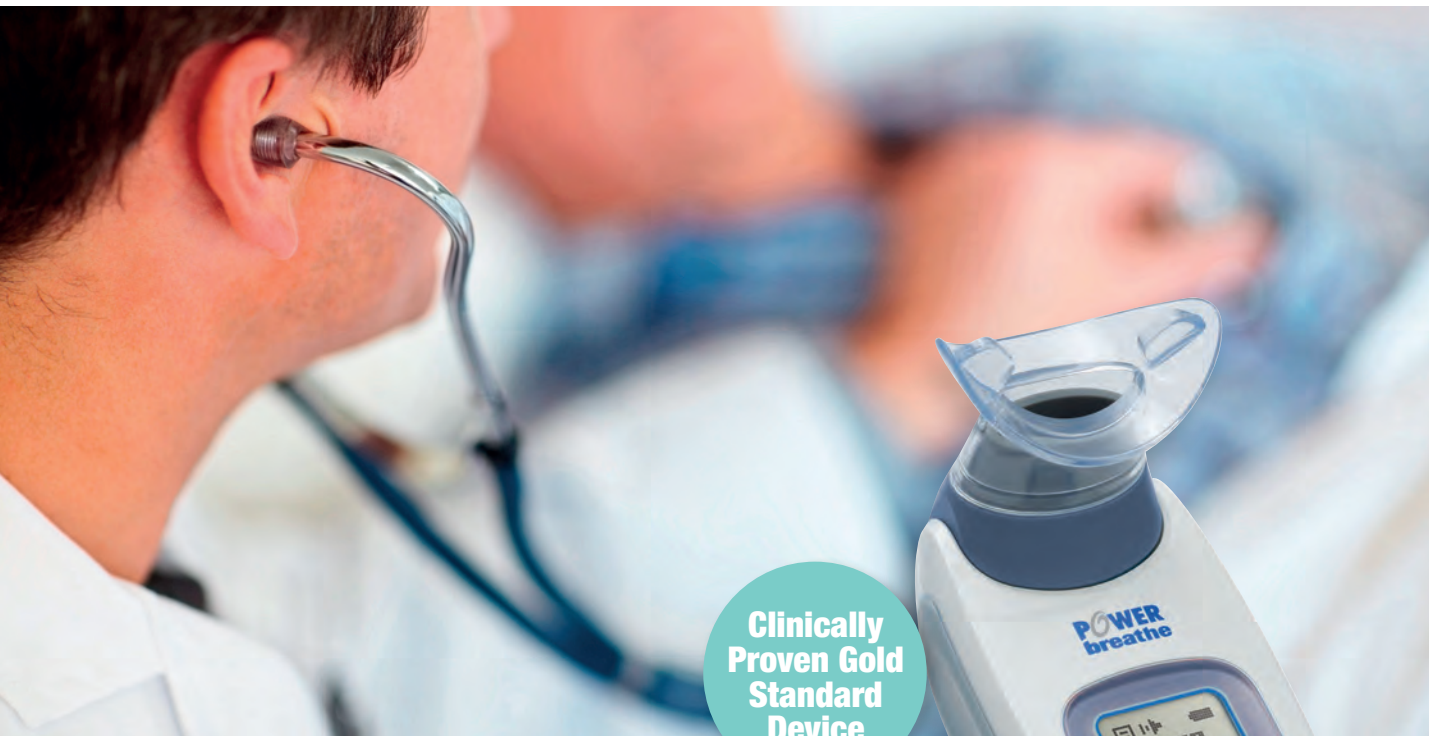
The screenshot shows a table with columns for patient information. The table contains multiple rows of data, including patient names, dates, and other identifiers. A blue highlight is visible on one of the rows.

CSV (Comma Separated Values) file can be generated allowing easy integration to excel and other spreadsheet applications. Additional features include sort, search (second name only), edit, add and export/import user data in one localised window.



The screenshot shows a window titled 'Export' with a list of data fields and their corresponding values. The fields include patient name, date, and other training parameters. The data is presented in a structured, tabular format.





**Clinically Proven Gold Standard Device**



**KH1**

**For healthcare professionals**

**The new POWERbreathe KH1 is a revolutionary inspiratory muscle training device designed specifically for the healthcare professional. The application of POWERbreathe RMT/IMT within healthcare and medical markets is now widely accepted and is used in such patient groups as COPD, Asthma, ICU and Cardiac.**

By using the Maximum Inspiratory Pressure (MIP) test incorporated into the KH1, the patient can undertake a baseline measurement and train according to the scientifically proven 30 breaths twice a day protocol and re-measure the MIP to quantify the improvement.

**POWERbreathe KH1 features:**

- Manually adjustable variable training load (5-200cmH<sub>2</sub>O)
- Advanced electronic variable load training
- Single breath test MIP
- Single breath test (PIF/Flow Test)
- Test results (PIF/Flow Test and MIP)
- Current training results (Inhaled Volume, Power, Load)
- Current training results (T-Index %)
- Breathing pacing guidance (audible beep)
- Interchangeable valve heads for multiple users
- Single use TrySafe™ filter option available for testing
- Compatible with oxygen adapter and face mask
- Ergonomic design for adult and paediatric use

**Parameters displayed include:**

- Maximal Inspiratory Pressure (cmH<sub>2</sub>O), highest 1 second average
- Peak Inspiratory Flow (L/s)
- Training load (cmH<sub>2</sub>O)
- Average Power (Watts)
- Average inhaled volume (L)
- T-Index (training intensity index)



**Advanced Smart Breathing Training Features Include:**

See page 16 & 17 for a full description of the KH-Series Smart Breathing Training features or visit [powerbreathe.com](http://powerbreathe.com)





**Clinically Proven Gold Standard Patient Device**

# KHP2

## Advanced technology to ensure patients reach their full potential



**Following Professional consultation using the KH1 or KH2, whether it is for rehabilitation, pre-operative conditioning or symptom relief of lung function limiting diseases and conditions, the patient can then use the POWERbreathe KHP2 model at home, as part of their on-going treatment plan.**

Clinical research has shown high patient motivation due to the on screen feedback which has resulted in high compliance (90%+) and significantly improved lung muscle strength and stamina.

Correspondingly, healthcare professionals are able to review patient progress by tracking up to 36 training sessions which the KHP2 can store.

The electronic, variable, tapered flow valve ensures the maximum training benefit (see chart on page 4).

POWERbreathe KHP2 is cost effective, easy to use, easy to clean and training improvements can be easily monitored.

- Technology Features:**
- Auto-optimising training technology
  - Training intensity selector
  - Training guidance system
  - Training results display



**Advanced Smart Breathing Training Features Include:**

See page 16 & 17 for a full description of the KH-Series Smart Breathing Training features or visit [powerbreathe.com](http://powerbreathe.com)



**NEW**



# Medic **PLUS**+

**New variable load range starting from 1 - 78cmH<sup>2</sup>O**

**The POWERbreathe Medic Plus is the second generation of POWERbreathe Medic RMT (Respiratory Muscle Training) devices and features a 65% improvement in airflow dynamics compared to the first generation POWERbreathe Medic.**

POWERbreathe Medic Plus is scientifically proven to strengthen the respiratory muscles, reducing breathlessness, improving exercise tolerance and enhancing quality of life in a wide range of patients.

POWERbreathe RMT/IMT devices offer evidence-based, drug-free treatment for patients with a variety of medical conditions including COPD, Heart Failure, Asthma, Rehabilitation following Thoracic Surgery, Ventilator Weaning, Cystic Fibrosis and Neuromuscular Disease.

The POWERbreathe Medic Plus offers the lowest entry level load of any threshold device currently available.

The 1cmH<sub>2</sub>O entry load allows patients who are in ICU or who have severe breathing difficulties, to begin training their respiratory muscles which otherwise would not be trained.

Featuring variable load settings from 1 - 78cm/H<sub>2</sub>O, POWERbreathe Medic Plus, offers in one device a drug free RMT/IMT solution that should satisfy most patient groups needs, at a very low cost to the patient or healthcare provider i.e. NHS in the UK.

POWERbreathe Medic Plus incorporates the latest developments in mechanical design technology together with comfortable ergonomic design to deliver:

- 65% improvement in airflow dynamics
- Easy to adjust resistance
- Easy to read resistance gauge
- Lower entry load to suit i.e. COPD users
- Variable load settings 0 – 10 levels
- Variable load range 1 – 78cmH<sub>2</sub>O
- Anti-scratch materials
- Simple disassembly for cleaning
- Soft touch nose clip
- New mouthpiece design is suitable for ages 7 and upwards



# Medic

Available to patients on Prescription since 2006

The POWERbreathe Medic Inspiratory Muscle Trainer was approved for prescription in March 2006 after being rigorously assessed by the NHS - Prescription Pricing Authority in the UK, for clinical evidence, patient compliance and financial savings. POWERbreathe Medic is also available from the NHS Supply Chain Respiratory Contract.

POWERbreathe Medic RMT/IMT has been taken up by medical professionals as an adjunct to pharmacological treatments.

Used both as a standalone therapy or in conjunction with pulmonary rehabilitation, POWERbreathe Medic training can be completed with or without supervision.



## COPD

In their 2005 study of the benefits of a 12 month programme of POWERbreathe IMT training, Beckerman et al observed significant reductions in the use of healthcare resources. POWERbreathe IMT reduced hospital bed days by 29% and GP consultations by 23% compared with placebo.

## Asthma

Weiner et al observed an 86% reduction in hospitalisations/emergency room visits following inspiratory muscle training in moderate/severe asthmatics (from 1.4 to 0.2 per 3 months per patient). In three separate studies, Weiner et al. observed an average 51% reduction in  $\beta$ 2-agonist consumption (from 3.9 to 1.6 puffs per day) after inspiratory muscle training, and in one study, corticosteroid use decreased ~80%.



## POWERbreathe Medic:

- Available for prescription in the UK
- Pressure threshold training
- Mechanically adjustable variable load settings (10-90cmH<sub>2</sub>O)
- POWERbreathe IMT devices save the NHS / healthcare provider money and resources.

## Proven benefits of Inspiratory Muscle Training

- Inspiratory muscle strength up by 27%
- Reduces breathlessness up to 36%
- Improves quality of life up to 21%
- Improves exercise tolerance up to 28%
- GP visits reduced by up to 23%



NHS DRUG  
TARIFF LISTING PART  
IXA – APPLIANCES  
Inspiratory pressure  
threshold loading device  
PIP CODE:  
232-1040

Can easily be used by the patient straight out of the box.

*“Integration of the POWERbreathe Medic device alongside rehabilitation has yielded significant patient benefits.”*

**Kate Martin**

Therapy Team Lead / Clinical Specialist  
NHS BreathingSpace Hospital, Rotherham, UK

See page 18 & 19 to see clinical research or visit [powerbreathe.com](http://powerbreathe.com)



## POWERbreathe Better Breathing Products

POWERbreathe International continue to expand its range of quality, drug free, 'Better Breathing' training and respiratory care products by teaming up with leading researchers and developers to service the needs of consumers and professionals involved in healthcare, sport, fitness, education, research, corporate fitness, occupational health, uniformed services, life coaching/stress management and sleep therapy.







## Expectoration for adults and children

Probably the most popular mucus clearance devices used by professionals, patients and consumers with over 1 million sold worldwide.

## Shaker Medic PLUS+ for Hospitals / Clinics

### Simple relief from excessive mucus and its associated problems

- Autoclavable to 134°C (273°F), multi-user, reuseable, easy to use and affordable
- Improved air flow for higher intensity vibrations, produces positive expiratory pressure (PEP) to open the airways
- Increases expectoration, improves lung function and reduces dyspnoea
- For conditions such as COPD, Cystic Fibrosis, bronchiectasis and bronchitis
- Two designs of user friendly mouthpieces included to assist older and younger patients



Autoclavable multi-user option for medical facilities

## Shaker deluxe

### Personal Mucus Clearance Device

- Respiratory device for mobilising pulmonary secretions such as mucus and catarrh
- Can be used for chronic conditions such as COPD, asthma, emphysema and acute problems like chesty coughs, flu and bronchitis
- Uses the latest innovative design technology
- Produces vibrations in the chest cavity to 'shake' stubborn mucus loose
- Aids expectoration, increases lung efficiency, helping to reduce breathlessness and fatigue
- Two designs of user friendly mouthpieces included to assist older and younger users
- Affordable, easy to use single user model which can be used at home or away from home



Two designs of user friendly mouthpieces included

## Shaker classic

### Personal Mucus Clearance Device

- The original Shaker device offers simple and convenient relief from excessive mucus
- Can be used for chronic conditions such as COPD, asthma, emphysema and acute problems like chesty coughs, flu and bronchitis
- Affordable, easy to use single user model which can be used at home or away from home



For more information and specifications on the Shaker range from POWERbreathe visit [powerbreathe.com](http://powerbreathe.com)

## Basic Better Breathing Products

### RESPIRON

#### Simple Therapy for Breathing Difficulties

NEW

- Exercises and strengthens the breathing muscles
- Control and adjust exercise difficulty
- Encourages deep breathing, which can aid in relieving excess mucus
- Helps prevent bronchial and pulmonary infections
- Excellent for lowering stress levels
- Easy to use and clean
- Low cost



### flow-ball

#### Simple, fun and educational

- Exercises your breathing muscles
- Increases control and the stability of your exhaled breath
- Easy to use, effective and great fun
- Popular with children and adults
- Beneficial for smoking cessation education
- Low cost
- Available in 2 colours – Blue and Yellow



### breathbuilder

by POWERbreathe

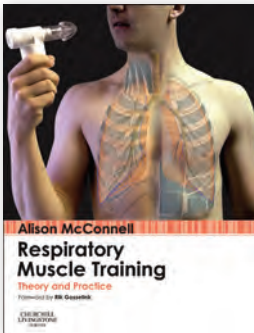
#### Breath Builder Classic

- Originally developed to help musicians and vocalists strengthen their diaphragm
- Exercises lungs and diaphragm muscles
- Helps you control inhalation and exhalation
- Beneficial to patients, smokers, and anyone with breathing difficulties
- Colours vary



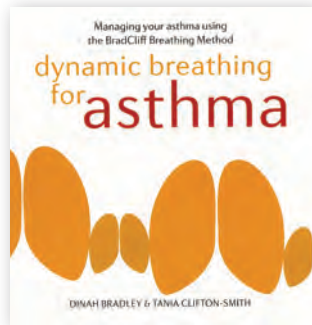


# Better Breathing Publications



## Respiratory Muscle Training Book

The “everything-you-need-to-know” guide to respiratory muscle training (RMT) by Professor Alison McConnell. Contents include: 1) Introduction to respiratory physiology and training theory; 2) How disease affects the respiratory muscles and the mechanics of breathing; 3) Insight into the disease-specific, evidence-based benefits of RMT; 4) Advice on the application of RMT as a standalone treatment and as part of a rehabilitation programme; 5) Guidance on the application of functional training techniques.



## Dynamic Breathing for Asthma Book

Internationally recognised experts Dinah Bradley and Tania Clifton-Smith using the BradCliff Method have made this, the asthma sufferer’s indispensable companion. In recent years, asthma patients may have been well informed about their drug management but less emphasis has been placed on physical coping skills and the importance of the correct use of the muscles of breathing. It takes you through a step by step breathing retraining process, which can help reduce medications, reduce stress levels, exercise comfortably and most importantly - breathe effectively.



## Breathing Matters Book

Breathing Matters is a revolutionary book written by Dr. Jim Bartley, one of New Zealand’s top ear, nose and throat surgeons, who believes that good breathing patterns can dramatically improve the lives of people with major diseases such as heart disease, asthma, depression and migraine. Breathing well helps us relax, normalises body biochemistry, reduces muscle pain and allows the re-establishment of normal posture and movement. Co-authored by internationally recognised authority on breathing disorders - Tania Clifton-Smith (Dip Phys)

# POWERbreathe RMT/IMT Accessories



“Try Before you Prescribe” package for clinics



POWERbreathe Spacer for KH-Series



POWERbreathe Single Use Try-Safe™ Filter compatible with RMT/IMT and Shaker Medic Plus/Deluxe devices



POWERbreathe Oxygen Mask Adapter



Adult Mask Small



Adult Mask Medium



Adult Mask Large



POWERbreathe KH-Series Nose Clip



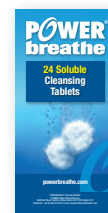
POWERbreathe Medic Nose Clip



POWERbreathe Mouthpiece for Medic and Medic Plus



K-Series Single Pack Valve Head Blister Pack





POWERbreathe Cleansing Tablets


## POWERbreathe KH-Series features

The patented technological advances developed and applied to the POWERbreathe KH-Series devices, offer precision measurement of respiratory pressure and flow at 500Hz per second and micro-adjustment to the valve and training load at 4,000Hz per second. As a result, the electronically controlled variable pressure threshold resistance is optimised to match the strength profile of the users' inspiratory muscles, to achieve maximum personalised training effectiveness.

### Training Features:


 **Auto IMT:** The POWERbreathe KH-Series Auto-optimising Inspiratory Muscle Training system automatically adapts to the patients personal training requirements.


 **Manual Training Intensity:** The training intensity adjustment option allows resistance to be manually set from 5 to 200cmH<sub>2</sub>O to suit the patients personal training requirements.


 **Training Guidance:** The KH-Series training guidance system provides breathing pacing guidance, displays the number of breaths remaining in the training session and informs the patient when the session is complete.


 **Warm-up & Cool-down mode:** Automatically sets the optimal resistance for inspiratory muscle warm-up and cool-down.


### Training Feedback and Testing Features:

 **Training Results:** Provides detailed breathing training feedback including Load (cmH<sub>2</sub>O), Power (Watts) and Inhaled Volume (Litres).


 **Strength Index (S-Index):** Calculates inspiratory muscle strength (cmH<sub>2</sub>O) based upon peak inspiratory flow. Strength index is rated in comparison with predicted value.


 **Single Breath Test:** Measures inspiratory muscle strength, peak inspiratory flow rate and inhaled volume in a single breath. Rates inspiratory muscle strength (Poor, Fair, Average, Good, Excellent) in comparison with the predicted value.

 **Training Index (T-Index):** Displays the percentage effectiveness and effectiveness rating (Poor, Fair, Average, Good, Excellent) of the patients breathing training session based upon the amount of work achieved.


 **Breathing Energy:** Measures the mechanical work of breathing during the patients breathing training session. Breathing energy combines the force exerted by the inspiratory muscles and the volume of air inhaled.


 **Respiratory Muscle Testing (RMT):** Maximum Inspiratory Pressure and Peak Inspiratory Flow tests for inspiratory muscle assessment.


 **Endurance Programme:** Endurance protocol. Perform a 150 breath training session to completely fatigue the breathing muscles.


 **Training History:** Displays a graphical history of the patients last 36 training sessions allowing you to review trends and previous personal best results.

### Standard Features:


 **Multi-User Options:** Personal Interchangeable Valve Heads sold separately and/or single user filters available for clinical use.


 **Washable Valve:** The KH-Series valve head can be removed for cleaning using POWERbreathe Cleansing Tablets (sold separately).


 **Rechargeable:** Rechargeable power system with auto power-off and charge level indicator. KH-Series devices can also be powered via PC or mains power.


 **Multi-user Filter Option:** Unique spacer which allows the connection of POWERbreathe TrySafe™ filters for effective filtration of bacteria and viruses. Offers exceptional protection against cross infection.

### Breathe-Link Features:

 **Breathe-Link Medic Software:** PC connectivity via USB enables real time training and performance testing. Select specific training and testing parameters and then assess inspiratory muscle condition and training progress to try and beat previous scores.

 **Breathe-Link Medic Custom:** Allows the professional to create and upload the patients personalised breathing training sessions.

 **Breathe-Link Medic Pro-View:** Use the Breathe-link Pro-View for advanced, detailed, simultaneous plotting and analysis of all inspiratory muscle training data.

 **Breathe-Link Medic Patient Data:** Integrated patient view showing all registered patients on the Breathe-Link Medic software. The Patient View master control panel allows you to easily access and navigate patients RMT/IMT training data.

















### POWERbreathe Customer Care

When you buy a POWERbreathe device you get so much more than what's in the box. We'll be here to help you maximise the benefits of your purchase by providing guidance and assistance to help you and your patients optimise its use. Visit: [powerbreathe.com](http://powerbreathe.com)

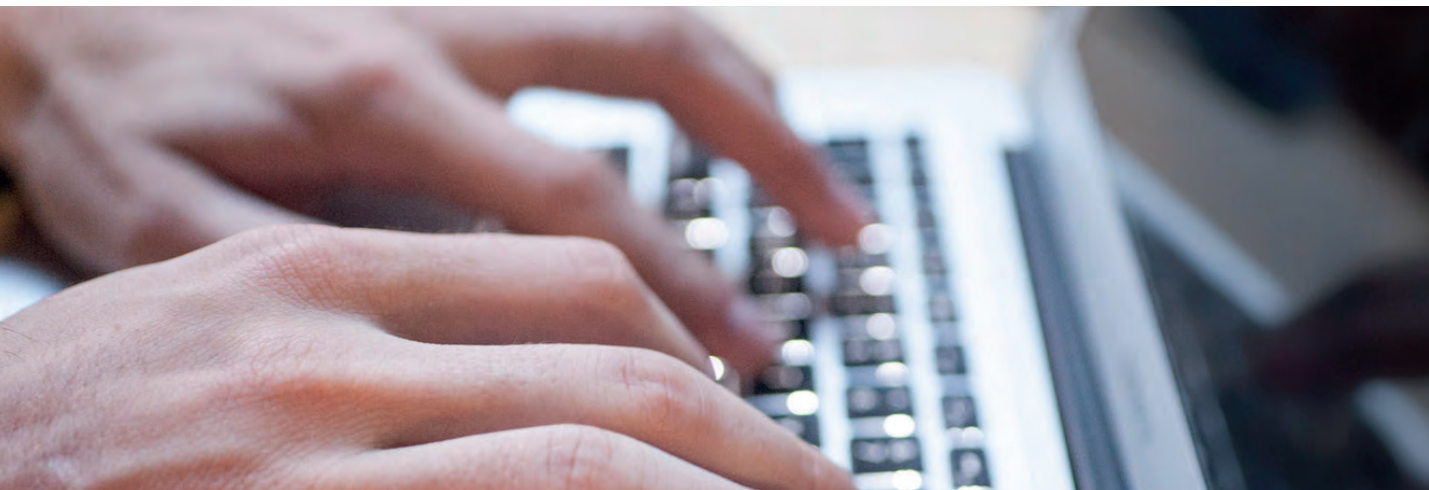


# POWERbreathe KH-Series comparison chart

All POWERbreathe KH-Series use an electronically controlled resistance valve which provides a variable pressure threshold resistance, optimised to match the strength profile of the inspiratory muscles for maximum training effectiveness.

Icon	Features	Explanation of features	KH2	KH1	KHP2
<b>Training Features</b>					
	Auto-optimising IMT technology	The POWERbreathe KH-Series Auto-optimising Inspiratory Muscle Training system automatically adapts to your personal training requirements.	●	●	●
	Manual training intensity option	The training intensity adjustment option allows resistance to be manually set from 5 to 200cmH <sub>2</sub> O to suit your personal training requirements.	●	●	●
	Breathing pacing guidance	Buzzer indicates when the user should inhale in order to optimise breathing patterns and prevent hyperventilation	●	●	●
	Current training session breath counter	Displays number of breaths remaining in current training session	●	●	●
	End of training session indicator	Alarm indicates that training session is over	●	●	●
	Warm-up mode	Can be used to warm-up the inspiratory muscles prior to exercise	●		
	Cool-down mode	Can be used to cool-down the respiratory muscles after exercise			
	Custom mode	Personalise your training session created using Breathe-Link Medic PC software	●		
<b>Training Feedback and Testing Features</b>					
	Load (cmH <sub>2</sub> O)	Measure of the resistance to inhalation and is equivalent to the weight being lifted	●	●	●
	Power - current session average (watts)	Current session average power (watts)	●	●	●
	Inhaled volume - average per breath (litres)	Current session average volume (litres)	●	●	●
	PIF/Flow	Peak Inspiratory Flow (litres/sec)	●	●	
	Volume	Maximum inhaled volume (litres)	●		●
	MIP	Maximal inspiratory muscle strength (cmH <sub>2</sub> O)	●	●	
	MIP rating	Comparison with population normal values based upon user stats (Age, Height, Weight, Gender)	●	●	
	S-Index	Index of inspiratory muscle strength (cmH <sub>2</sub> O)	●	●	
	S-Index Rating (poor, fair, average, good, excellent)	Comparison with population normal values based upon user stats (Age, Height, Weight, Gender)	●	●	
	Test mode (S-Index - Single breath test)	Measures inspiratory muscle Strength Index	● <sup>1</sup>	● <sup>1</sup>	
	T-Index - current session (%)	Training Index (%) [Measure of training session effectiveness]		●	
	T-Index rating (low, med, high)	Rating of training session effectiveness		●	
	Breathing energy (joules)	Measures the mechanical work of breathing during your breathing training session. (Joules)	●		●
	Graphical breathing energy history (last 36 sessions)	Graph of previous 36 Breathing Energy results			●
	Session number	Number of training sessions completed			●
	Test mode (PIF/Flow)	Measures Peak Inspiratory Flow	●	●	
	Test mode (MIP)	Measures Maximal Inspiratory Pressure (highest 1 sec average)	●	●	
	Endurance Programme	Perform a 150-breath session to completely fatigue the inspiratory muscles	●		
	Graphical load history (last 36 sessions)	Graph of previous 36 training load results			●
	Graphical power history (last 36 sessions)	Graph of previous 36 average power results			●
	Graphical volume history (last 36 sessions)	Graph of previous 36 average volume results			●
<b>Breathe-Link Features</b>					
	Breathe-Link PC software for real-time breathing measurement and analysis	Real-time breathing measurement & analysis software for PC Maximises training & test performance in real-time. Stores results for analysis. Import and Export .ble files allowing data to be shared amongst Breathe-Link users.	●		
	PC graphical view	Easy to understand live test, feedback graphs to monitor each breath, with visual feedback to help improve your performance.	●		
	Breathe-Link custom training mode	Allows you to create and upload your own personalised breathing training sessions.	●		
	Training statistics review	Review the details and trends of your Breathe-Link training sessions.	●		
	Breathe-Link ProView advanced analytics	For a detailed, simultaneous plotting & analysis of all inspiratory muscle training data.	●		
	Print/PDF generator	Keep detailed high resolution records of each session. Share training history for analysis in printed or PDF format.	●		
	Live real-time performance monitoring	See real-time test and training performance live on screen.	●		
	Breathe-Link Medic Patient Data	Integrated patient view showing all registered patients on the Breathe-Link Medic software. The Patient View master control panel allows you to easily access and navigate patients RMT/IMT training data.	●		

● Indicates Features Included ●<sup>1</sup> Note 1: For the KH1 model, S-Index test result is output following a PIF test. (Information subject to change due to manufacturers continuous program of development).



## Knowledge Base

Scientific research supporting the clinical use of IMT that led to the POWERbreathe Medic being made available for prescription by the National Health Service (NHS) in the UK

### Clinical use of IMT - Heart Failure

Inspiratory Muscle Training Improves Blood Flow to Resting and Exercising Limbs in Patients With Chronic Heart Failure (Chiappa et al; Journal of the American College of Cardiology; 2008)

*"In patients with CHF and inspiratory muscle weakness, inspiratory muscle loading results in marked reduction of blood flow to resting and exercising limbs. Inspiratory muscle training improves limb blood flow under inspiratory loading in these patients."*

Inspiratory Muscle Training in Patients With Heart Failure and Inspiratory Muscle Weakness (Dall'Ago et al; Journal of the American College of Cardiology; 2006)

*"In patients with CHF and inspiratory muscle weakness, IMT results in marked improvement in inspiratory muscle strength, as well as improvement in functional capacity, ventilatory response to exercise, recovery oxygen uptake kinetics, and quality of life."*

### Clinical Use Of IMT - Asthma

Inspiratory Muscle Training In Patients With Bronchial Asthma (Weinar et al; Chest; 1992)

*"We conclude that specific inspiratory muscle training, for six months, improves the inspiratory muscle strength and endurance, and results in improvement in asthma symptoms, hospitalizations for asthma, emergency department contact, absence from school or work, and medication consumption in patients with asthma."*

### Drug-free treatment for dyspnoea

POWERbreathe IMT is suitable for treating dyspnea in a wide range of patients, including those with severe exercise intolerance and cardiovascular risk factors.

- Reduce dyspnoea by 36%<sup>1</sup>
- Improve quality of life by 21%<sup>1</sup>
- Improve exercise tolerance by 28%<sup>1</sup>
- Reduce consumption of  $\beta_2$ -agonists by up to 79%<sup>2</sup>
- Reduce primary care consultations by 23%<sup>1</sup>

#### Supporting research:

<sup>1</sup>The Effects of 1 Year of Specific Inspiratory Muscle Training in Patients With COPD (Beckerman et al; Chest; 2005)

<sup>2</sup>Inspiratory Muscle Training In Patients With Bronchial Asthma (Weinar et al; Chest; 1992)

### Clinical Use Of IMT - COPD

The Effects of 1 Year of Specific Inspiratory Muscle Training in Patients With COPD (Beckerman et al; Chest; 2005)

*"The study showed that during IMT in patients with significant COPD, there is an increase in exercise capacity, improvement in quality of life, and decrease in dyspnea. The study also provides evidence that long-term IMT can decrease the use of health services and hospitalization days."*

Effects of controlled inspiratory muscle training in patients with COPD: a meta-analysis (Lotters et al; European Respiratory Journal; 2002)

*"Inspiratory muscle training is an important addition to a pulmonary rehabilitation programme directed at chronic obstructive pulmonary disease patients with inspiratory muscle weakness. The effect on exercise performance is still to be determined."*

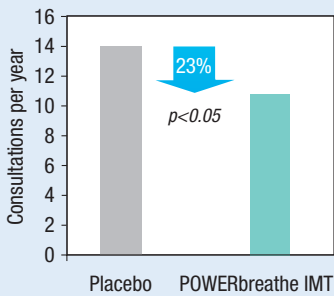
# POWERbreathe IMT saves money and resources

## Key facts and figures

### COPD

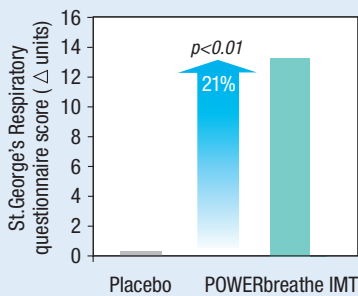
Reduce primary care consultations by 23%

Reduction in primary care consultations



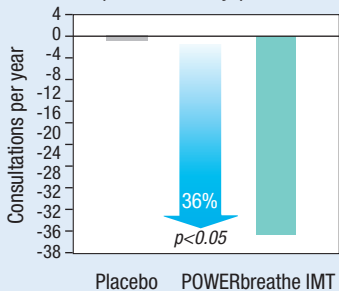
Improve quality of life by 21%

Improvement in Quality of Life



Improve dyspnoea by 36%

Improvement in dyspnoea score



### Reduced Healthcare Resources

In a 2005 study of the benefits of a 12-month programme of POWERbreathe RMT, researchers observed significant reductions in the use of healthcare resources.

#### Supporting research:

The Effects of 1 Year of Specific Inspiratory Muscle Training in Patients With COPD (Beckerman et al; Chest; 2005)

### Reduced Hospitalisations

Weiner et al observed an 86% reduction in hospitalisations/emergency room visits following respiratory muscle training in moderate/severe asthmatics.

#### Supporting research:

Inspiratory Muscle Training In Patients With Bronchial Asthma (Weinar et al; Chest; 1992)

### Reduced $\beta_2$ -agonist Consumption

In three separate studies, Weiner et al. observed an average 51% reduction in  $\beta_2$ -agonist consumption (from 3.9 to 1.6 puffs per day) after respiratory muscle training, and in one study, corticosteroid use decreased ~80%.

#### Supporting research:

Inspiratory Muscle Training In Patients With Bronchial Asthma (Weinar et al; Chest; 1992)

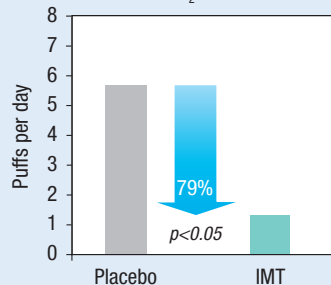
Specific Inspiratory Muscle Training in Patients With Mild Asthma With High Consumption of Inhaled 2-Agonists (Weiner et al; Chest; 2000)

Influence of Gender and Inspiratory Muscle Training on the Perception of Dyspnea in Patients With Asthma (Weiner et al; Chest; 2002)

### Asthma

Reduce  $\beta_2$ -agonist use by up to 79%

Reduce  $\beta_2$ -agonist use

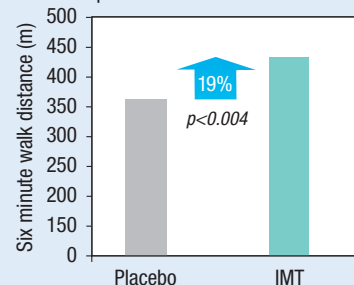


- FEV<sub>1</sub> improved by 14% (p<0.005)
- Absence from school/work reduced by ~95%<sup>2</sup> (p<0.005)
- Emergency hospitalisations reduced by ~75%<sup>2</sup> (p<0.005)

### Heart Failure

Improve exercise tolerance by 19% and quality of life by 16%

Improvement in exercise tolerance



\*References cited above may be accredited at [www.powerbreathe.com](http://www.powerbreathe.com)

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