

IMPROVING PATIENT OUTCOMES: Episode 3 of 3



TREATMENT, DOCUMENTATION AND DISCHARGE PLANNING As It Relates To Respiratory Muscle Weakness



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Content Expert

TODAY'S LEARNING OUTCOMES

Upon completion of this webinar, participants will be able to:

1. Review causes, prevalence and implications of RMW
2. Identify specific Respiratory Muscle Treatment strategies to effectively treat patients in all settings
3. View therapist and patient demonstration videos to improve RMT outcomes
4. Develop a measurable goal and progress note for each discipline utilizing RMT to treat RMW
5. Identify appropriate post discharge interventions to improve carryover of skills gained while on caseload



MEET THE EXPERTS



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Part 1

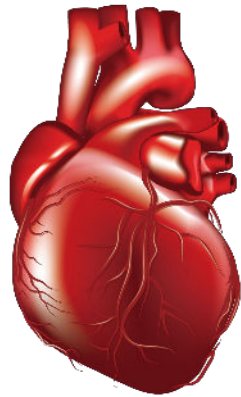
RMW Causes, Prevalence and Implications



RESPIRATORY MUSCLE WEAKNESS

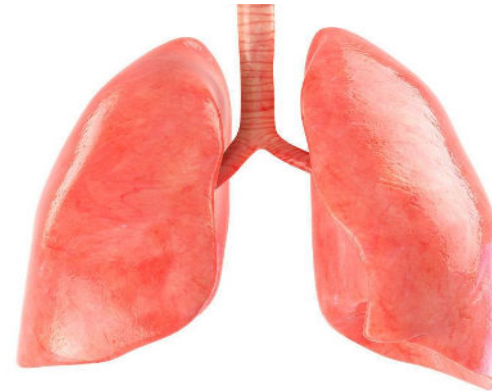
UNDERRECOGNIZED AND UNDERTREATED

Cardiac Pump

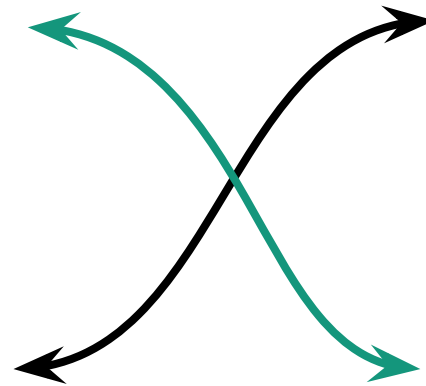


Oxygen delivery

Ventilatory Pump



Oxygen intake, CO₂ excretion



Prevalence of RMW

≤ 50% of CHF patients

≤ 50% of COPD patients

≤ 100% of elderly

≤ 69% of ICU patients



RESPIRATORY MUSCLE TRAINING (RMT)



RMT is a direct treatment of RMW by strengthening

- **Inspiratory Muscles:** diaphragm, external intercostals, accessory muscles.
- **Expiratory Muscles:** internal intercostals, abdominals.
- **Muscles** of deglutition and phonation

RESPIRATORY MUSCLE TRAINING

RMT increases respiratory muscle strength by adding a workload on the respiratory muscles. The workload is derived from breathing against increasing resistance.

Training against resistance activates the respiratory muscles the same way that it activates peripheral (skeletal muscles), triggering

- Muscle hypertrophy
- Muscle velocity (diaphragm function)
- Muscle endurance (diaphragm fatigue)
- Muscle power output



Part 2

RMT Strategies



SIDE BY SIDE DEVICE COMPARISON

Description	Positive Expiratory Pressure (PEP)	Incentive Spirometer (IS)	The Breather (RMT)
Forced Exhalation (against resistance)	X		X
Maximal Inspiration		X	X
Forced Inspiration (against resistance)			X



SIDE BY SIDE DEVICE COMPARISON

Incentive Spirometer

- Promotes sustained maximal inspiration
- Mimics sighing or yawning
- Aims to increase transpulmonary pressure and inspiratory volumes
- Activates inspiratory muscles
- Re-establishes the normal pattern of pulmonary inflation



PEP/OPEP Devices

- Provides mild resistance to exhalation
- Promotes mucus secretion and airway clearance
- Supports pulmonary hygiene
- Some PEP devices offer oscillatory function (OPEP) for enhance loosening of mucus



THE BREATHER

THE BREATHER is an Inspiratory/Expiratory Respiratory Muscle Training device (RMT).

Increasing muscle strength using *resistance training* is effective in respiratory muscles, just as it is in peripheral skeletal muscles. Breathing against resistance during respiratory muscle training (RMT) activates and strengthens respiratory muscles and improves health and quality of life by promoting regained activity and exercise tolerance.



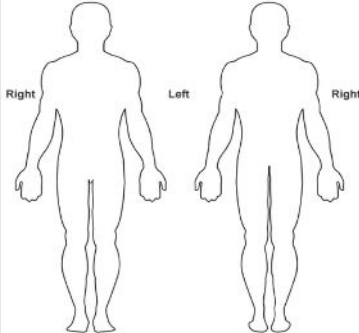
Part 3

Assessments and Treatments



ASSESSMENTS: TYPES OF MEASURES

1. Breathing Pattern
2. Cognitive Level
3. ACSM Dyspnea Scale
4. Borg Scale
5. Ventilatory Response Index (VRI)
6. Maximum Phonation Time (MPT)
7. Timed Up & Go (TUG)
8. Swallow Function/Voice Quality
9. Vital Monitoring
10. Technological Advances

Name	File #	Date
Current Complaints		
Progression of your current condition since it started		
<input type="checkbox"/> Same	<input type="checkbox"/> Improved	<input type="checkbox"/> Worse
<input type="checkbox"/> Other		
Does your present condition affect your daily activities at home or in the office? Describe:		
Type of pain		
<input type="checkbox"/> Sharp	<input type="checkbox"/> Tingling	<input type="checkbox"/> Throbbing
<input type="checkbox"/> Numbness	<input type="checkbox"/> Aching	<input type="checkbox"/> Shooting
<input type="checkbox"/> Dull	<input type="checkbox"/> Burning	<input type="checkbox"/> Cramping
<input type="checkbox"/> Stiffness	<input type="checkbox"/> Swelling	<input type="checkbox"/> Other
Other comments and notes		
		Describe the areas where you feel pain and provide as much detail as possible. Mark the body outline to indicate location of pain.



TREATMENT: DIAPHRAGMATIC BREATHING

Diaphragmatic breathing is a huge part of RMT.

- It improves inhalation and exhalation for proper exchange of O₂ or CO₂
- Encourages focused breathing for the patient to utilize when experiencing respiratory dysfunction

Some patients do not accurately utilize the 'smell the roses' 'blow out the candles' intervention

Try the umbrella approach from Sara Meeks PT



TREATMENT: DIAPHRAGMATIC BREATHING



TREATMENT: ESTABLISH A BASELINE

Obtain baseline for resistance tolerated as well as tolerated breaths per set and number of sets.

You should ask your patient frequently for feedback including:

- How do you feel?
- Do you feel out of breath or lightheaded?

You should also observe:

- Each inhale / exhale should be able to be forcefully maintained for 2-3 seconds.
- Inspiratory resistance should cause an outward movement of the abdominal wall on all inhalations. If inward movement of the abdominal wall occurs on a few, but not all inhalations, this could be a sign of fatigue; the patient should rest more between breaths or sets.
- Expiratory resistance should not cause puffing of the cheeks. If patient cannot eliminate this, the patient may need to rest more between breaths or a decrease in expiratory resistance may be indicated. The therapist may also hold patient's cheeks or have patient hold his cheeks. (A demo may be necessary.)



TREATMENT: FIRST SESSION



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TREATMENT: CALMING INTERVENTION

“One of the most basic elements our bodies need to survive is oxygen, which we obtain through breath. COPD impacts one’s ability to breathe deeply, and this alone can result in anxiety, not to mention the psychological stress that can arise from living with chronic illness,” says [Caryn Blanton](#), MSW, LCSW, a licensed clinical social worker at Rush University Medical Center.

Coping with COPD and Anxiety by Caryn Blanton, MSW, LCSW | November 27, 2018 (Last Updated: October 11, 2019)



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TREATMENT: CALMING INTERVENTION



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Part 4

Documentation



DOCUMENTATION: RMT SAMPLE GOALS

- **Respiratory Therapy:** Patient will improve respiratory function to support ability to achieve airway clearance via productive cough.
 - STG example: Pt will improve ability to produce productive cough on 3/5 attempts.
- **Speech Therapy:** Patient will improve respiratory support for speech production and/or swallow safety.
 - STG: Pt will improve Max Phonation Time from 5 seconds to 8 seconds.
- **Occupational Therapy:** Patient will improve respiratory function to increase activity tolerance for ADL completion.
 - STG: Pt will complete morning routine requiring only 2 rest periods due to SOB.
- **Physical Therapy:** Patient will improve respiratory support to improve endurance/aerobic capacity for functional mobility.
 - STG: Pt will demo decreased SOB during functional ambulation as evidenced by Dyspnea Scale from Level 3 to Level 1.



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DOCUMENTATION

RESPIRATORY THERAPY

- **Sample Goal:** Patient will improve respiratory function to support ability to achieve airway clearance via productive cough.
 - STG example: Pt will improve ability to produce productive cough on 3/5 attempts.
- **Progress Notes: Demonstrating Progress**
 - Patient has demonstrated improvement in respiratory function with improved airway clearance and reduced ronchi. Patient has increased use of productive cough to clear airway from 1/5 attempts to 2/5 attempts.
- **Progress Notes: Demonstrating Medical Necessity**
 - Patient continues to exhibit difficulty with productive cough with ability to clear airway on 1/5 attempts. Patient has demonstrated some improvement with decrease in wheezing. Patient requires ongoing RT to optimize airway clearance to decrease risk of rehospitalization



DOCUMENTATION

SPEECH THERAPY

- **Sample Goal:** Patient will improve respiratory support for speech production and/or swallow safety.
 - STG: Pt will improve Max Phonation Time from 5 seconds to 8 seconds.
- **Progress Notes: Demonstrating Progress**
 - Patient exhibits improved MPT from 5 seconds to 6 seconds impacting breath support for respiratory/speech cycle improving communication within social settings
 - Patient has increased MPT from 5 seconds to 6 seconds exhibiting improved breath support during respiratory/swallow cycle impacting swallow safety at meals
- **Progress Notes: Demonstrating Medical Necessity**
 - Patient MPT has remained steady at 5 seconds this period, however patient has demonstrated increased use of diaphragmatic breathing during sessions with improved breath support during respiratory/swallow cycle impacting swallow safety at meals. Skilled ST indicated to return swallow safety/function to prior level to decrease risk of aspiration



DOCUMENTATION

OCCUPATIONAL THERAPY

- **Sample Goal:** Patient will improve respiratory function to increase activity tolerance for ADL completion.
 - STG: Pt will complete morning routine requiring only 2 rest periods due to SOB.
- **Progress Notes: Demonstrating Progress**
 - Patient has demonstrated excellent progress this week with strengthened activity tolerance during ADL tasks as evidenced by requiring only 3 rest periods due to SOB vs 5 rest periods with improved use of diaphragmatic breathing without verbal cues.
- **Progress Notes: Demonstrating Medical Necessity**
 - Patient demonstrated progress with pre-emptive skills this week toward each functional goal area. Patient improved out of bed tolerance and unsupported sitting balance which impacts transfer and sitting up for meals goal areas. Patient to continue with skilled OT treatment in order to meet goal areas.



DOCUMENTATION

PHYSICAL THERAPY

- **Sample Goal:** Patient will improve respiratory support to improve endurance/aerobic capacity for functional mobility.
 - STG: Pt will demo decreased SOB during functional ambulation as evidenced by Dyspnea Scale from Level 3 to Level 1.
- **Progress Notes: Demonstrating Progress**
 - Patient has demonstrated marked improvement in respiratory function this week impacting endurance with functional mobility and improvement noted in Dyspnea Scale from Level 3 to Level 2
 -
- **Progress Notes: Demonstrating Medical Necessity**
 - Patient with medical decline this week impacting functional mobility and decreased endurance during ambulation. Continued skilled PT indicated to decrease SOB, optimize endurance/respiratory function to increase independence, safety and decrease burden of care.



Part 5

Discharge Planning



DISCHARGE PLANNING

Patients are less likely to decline when they have aftercare or a discharge plan in place.

- Home Exercise Plan (HEP)
- Restorative Nursing Program (RNP)
- Functional Maintenance Plan (FMP)
- Caregiver/Staff Education



DISCHARGE PLANNING

Home Exercise Plan (HEP)

- Exercise sheets
- Self-Monitoring checklists
- Training Journal
- Tracking logs

THE BREATHER® TRAINING JOURNAL

STARTING DATE: _/ _/ _

BEFORE YOU BEGIN, WATCH THIS:
[Lesson 02: Using & Cleaning The Breather](#)
www.pnmedical.com/lessons/breather-use-cleaning/

PROTOCOL:
___ Reps per set, ___ Sets per Session, ___ Sessions per Day, ___ Times per Week, at an Effort Setting of ___

WEEK 1	SUN		MON		TUES		WEDS		THURS		FRI		SAT	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
DIAL SETTINGS	/	/	/	/	/	/	/	/	/	/	/	/	/	/
SETS COMPLETED														
EFFORT %														



DISCHARGE PLANNING

Restorative Nursing Program (RNP)

- Upon admission under PDPM
- Upon discharge Restorative trained nursing aides carryout RMT program

Restorative Nursing Program

Resident: _____ Date: _____

Goal: (1) Maintain MAX breath support for speech production.
(2) Maintain strength for pharyngeal / laryngeal closure for voicing / swallow safety.

Approach:

Resistance Respiratory Exercise Program

Complete ___ sets of ___ reps / minutes of inspiratory & expiratory exercisers with use of Breather device set at ___/5 resistance for inspiration & ___/4 resistance for expiration. Make sure to take a good 2+ minute break between sets.



Therapist Signature: _____ Date Staff Trained: _____

Activities Staff Signatures: _____

Restorative Nurse Signature: _____

Restorative Staff Signatures: _____

Nursing Staff Signatures: _____



DISCHARGE PLANNING

Functional Maintenance Plan (FMP)

- Nursing Aides are trained to carry out the FMPs related to RMW
 - ie: Resident will maintain good breath support or airway clearance by CNAs reminding resident to rest during ADLs or use strategies to improve breath support during episodes of congestion



DISCHARGE PLANNING

Caregiver/Staff Education

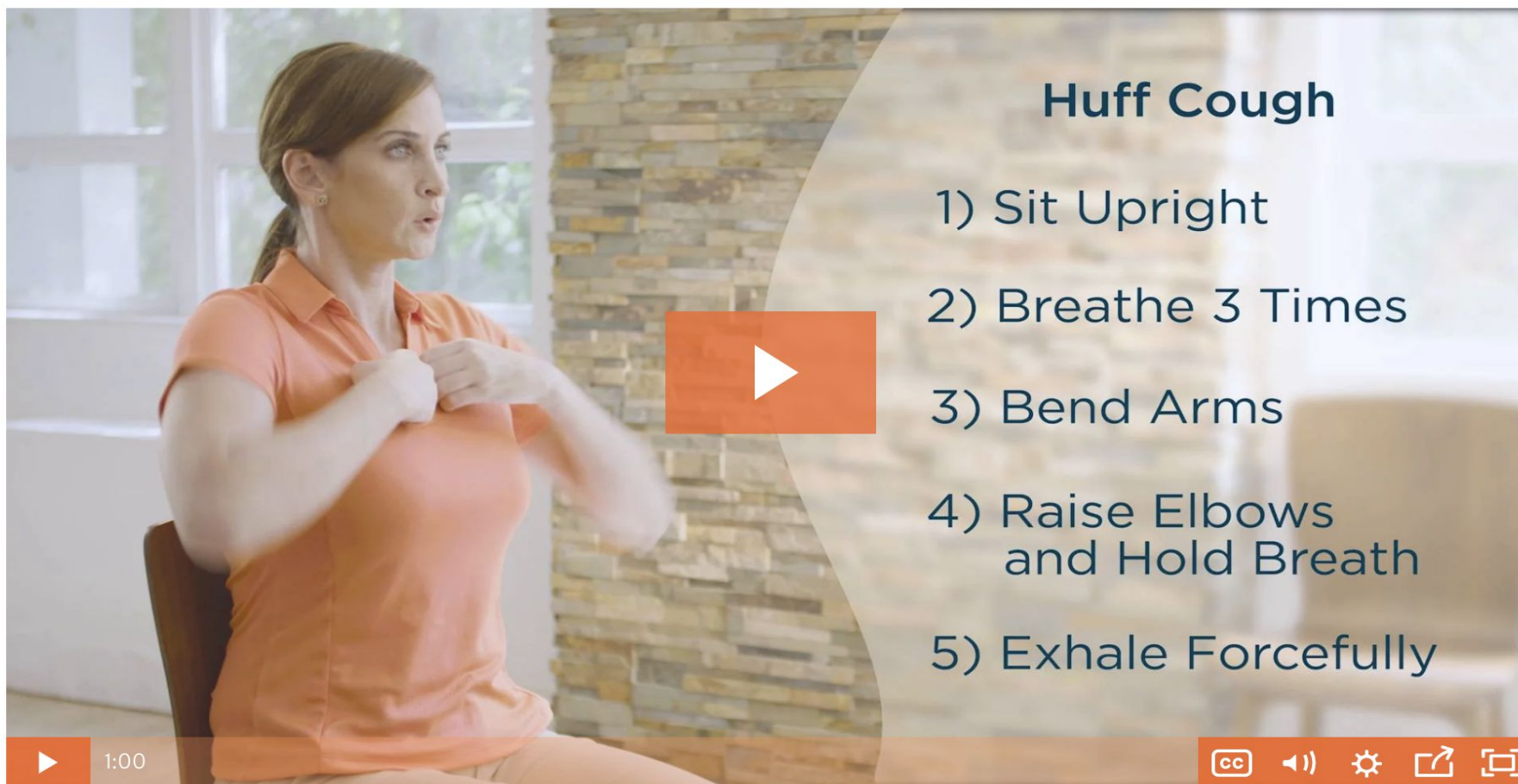
- If the patient is unable to follow the aftercare plan on their own due to physical or cognitive issues, caregiver education is a must in order to decrease their risk of declining
- Can use HEP, RNP or HEP format ensuring caregivers understand their role in program success



RESOURCES FOR AFTER CARE

PATIENT SELF TRAINING and THERAPIST TRAINING

www.pnmedical.com



- ▶ INTRO & MEET INVENTOR
- ▶ USING THE BREATHER
- ▶ FOUNDATIONAL PROTOCOL
- ▶ HOW TO CLEAN
- ▶ WHY TWO MOUTHPIECES

BONUS VIDEOS

- ▶ 6 Shortcuts To Improve RMT
- ▶ Diaphragmatic Breathing Technique
- ▶ The Huff Cough Maneuver
- ▶ Shortness Of Breath
- ▶ 60 Second Protocol
- ▶ Clinician Only In-Service Video



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RESOURCES FOR AFTER CARE

LATEST CLINICAL STUDIES, WEBINARS, INTERVIEWS

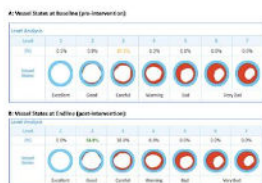
www.pnmedical.com



PILOT STUDY: HYOLARYNGEAL MUSCLE ACTIVATION IN RESPONSE TO RMT USING THE BREATHER

By Luke Johnson | Breather Clinical Trials, Clinical Trials | No Comments

Poster Presentation - DYSPHAGIA RESEARCH SOCIETY, 2019, San Diego, CA Matthew Dumican, M.S. CCC-SLP; Christopher Watts, Ph.D. KEY FINDINGS In neuromuscular disease, such as Parkinson's, activation of muscle groups for...



CASE STUDY: RMT AS AN INTERVENTION FOR CARDIOPULMONARY DECLINE

By Luke Johnson | Breather Clinical Trials, Cardiac Trials, Clinical Trials, Pulmonary Trials, Uncategorized | No Comments

Kevin Longoria, MS, CEP, CSO; Nina Bausek, MSc, PhD; Sigfredo Aldarondo, MD,FCCP KEY FINDINGS Unhealthy lifestyle habits can negatively affect cardiopulmonary parameters and contribute to respiratory muscle weakness. This case presents...



RESPIRATORY INTERVENTION TECHNIQUES INCREASE SELECTION RATE FOR SPECIAL FORCES

Neuromuscular
Speech and Swallow
Other diseases
ATHLETIC USE
Sport
Healthy Lifestyle
CLINICAL TRIALS
Breather Clinical Trials
Cardiac Trials
Pulmonary Trials
Neuromuscular



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SCHEDULE AN IN-SERVICE

Jan 28 Tue **Jan 29 Wed** Jan 30 Thu Jan 31 Fri Feb 1 Sat Feb 2 Sun Feb 3 Mon >

CHOOSE A TIME AM/PM 24 HOURS

All times are in (GMT -5:0) Eastern Standard Time (America/New_York)

10:00 AM

10:15 AM

[CLICK TO SCHEDULE AN IN-SERVICE](#)



IMPROVING PATIENT OUTCOMES: PAST EPISODES



Episode # 01

IMPROVING PATIENT OUTCOMES: Episode 1 of 3



Address Respiratory Muscle Weakness First
CAUSES SYMPTOMS TREATMENT



Episode # 02

IMPROVING PATIENT OUTCOMES: Episode 2 of 3



Top 10 Assessment & Treatment Tools To Address RMW
And How They Relate to Reimbursement



Part 6

Questions and Answers



Questions



Answers

Q: Has The Breather been used in clinical trials?

A: Yes, The Breather has been investigated in several clinical trials, as well as in a range of pilot studies.

To summarize some of the main outcomes that were observed:

1. A clinical study in COPD patients showed that 2 weeks of RMT using the Breather increased MIP by 31% and 6MWD by 55 ft.
2. In a case study, a patient with SCI used the Breather for 6 weeks, and improved his MIP by 113%, his MEP by 117%, and his peak cough flow by 67%.
3. In a home health setting, 4 weeks of using the Breather led to a 92% increase in peak expiratory flow and a 116% increase in maximum phonation time in COPD patients.
4. Additional studies using the Breather have shown for example that using the Breather nicely activates the hyolaryngeal muscles, as shown by sEMG, which is an important point for using the breather with dysphagia patients.
5. Also, the athlete's version of the Breather, Breather Fit, has been tested by the military, where it dramatically increased selection rate for special forces recruitment.
6. We have a number of ongoing studies as well. One IRB, funded by Mayo Clinic, has an aim to demonstrate the benefit of using The Breather in pre and post surgery for LVAD patients.

Recent Studies Published Using The Breather - <https://www.pnmedical.com/category/clinical-trials/breather/>



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Questions



Answers

Q: How long would you suggest that a patient use the same Breather device before replacing it with a new one? Is there a need to replace it?

A: The Breather Device has a one year warranty

Q: What pressure does each number on the breather represent?

A: The pressures generated by the specific settings of the Breather are flow dependent, and differ in healthy people/athletes/those with respiratory impairment. Please have a look at our website for typical pressure ranges.

Q: Does Medicare cover these devices? Do I need the physician to write a script for the Breather device?

A: You don't need a script to use the Breather but you need your eval and treat order as normal. Facilities typically purchase these for the patients. I have not seen medicare cover these in my experience.



Questions



Answers

Q: What do you recommend as most objective and accurate test or measurement to assess RMW?

A: The definition of RMW is that the respiratory muscle strength is reduced to equal or less to 70% of predicted value, assessed by maximum inspiratory or expiratory strength (MIP/MEP). Additional indicators for/manifestations of RMW include dyspnea, reduced exercise tolerance, dysphagia, dysphonia, etc.

Q: Orders are usually the CPTs that will be billed not component of the code ie ther ex vs quad , trunk and respiratory ms ex. too limiting that way.

A: The code used is based on the intent of tx. For example it could be billed as ther ex, neuromuscular re-ed, Speech tx, etc. We recommend reaching out to your company's clinical department for guidance related to coding policy.

Q: With COPD Patients demonstrating decreased breath support, would you use voice tx code or speech tx code?

A: It depends on your setting, state and MACS or Fiscal Intermediaries but I've seen speech code used in that scenario.



Questions



Answers

Q: Would Med A cover the device?

A: The Breather is used as a tool during treatment, so the facility usually purchases those under the Med A coverage, and then they are distributed to the patients. It's very cost effective.

Q: Do you need an order from an MD?

A: No, you don't need an order from a physician in home health or skilled nursing. You need an order for a valid treatment, and the Breather is a tool you would use for that treatment.

Q: What have you found to be a common reason for a medicare denial?

A: I have worked on denials for part a and b throughout my career, but I have not seen any related to RMT related to RMW.

Q: Can the breather be ordered by physician via SLP so that it can be covered by Medicare? Can breather used be in conjunction with LSVT?

A: Ask your HH Manager how things are billed to medicare. I have not seen the Breather reimbursed in my setting by medicare but it is worth a try. Many companies will purchase these for the patients due to the return on investment coming in outcomes and appropriate length of stay saving money in the long run. This would compliment LSVT well.



Questions



Answers

Q: What studies have been done with the Breather in various disciplines and disease states?

A: I recommend you [Go Here To Read The Latest Studies](#). We update the list monthly that have been published using our devices.

The Breather has been used in COPD studies where it has been shown to improve respiratory muscle strength, exercise tolerance and reduce the symptoms of dyspnea in COPD. This was an independent trial.

In another study the Breather has been used in home health with COPD patients over four weeks. It has been shown to improve peak expiratory flow and maximum phonation time roughly by about a hundred percent over four weeks.

The Christian University of Texas, Dr. Watts has shown by surface EMG how the Breather actually activates the submandibular muscles here while you're using it during inspiration as well as during expiration. He saw a really nice activation during inspiration and expiration. This ties back to the question before, should we treat both parts of the breath cycle? Absolutely, because you're actually training those muscles with both parts using the Breather.

Go here to see the latest studies that have been published. It's updated monthly - [Go Here To Read The Latest Studies](#)



Questions



Answers

Q: How do you know the patient's baseline resistance, and when they're ready to increase resistance?

A: The baseline can be established either by using a manometer, or by observation during a set of RMT. Puffing cheeks on exhale or light headedness are indicators to reduce the settings, low effort to complete a set would indicate that the settings should be increased. Use your clinical judgement to determine the optimal training intensity for each individual patient. Please note that settings for inhale and exhale should always be determined independently of each other, as the muscle groups for inhale and for exhale gain strength at different speeds.

Q: Is it possible to implement RMT with a patient with a trach?

A: Yes, that is possible, but you have to use your clinical judgement. Maybe try whether the patient can finger occlude first? I have used RMT with patients with a trach and I have them finger occlude while they do the Breather. It's real easy to take their hand off if they start to feel panicky or short of breath. This is a great way to increase respiratory muscle strength towards goals of using the Passy-Muir valve, or goals of capping the trach, or eventual goals of discharging. The use of RMT is very appropriate here. It's important to have your tools on hand to monitor vitals, and checking in with the patient on how they're feeling.



Questions



Answers

Q: What do you recommend as most objective and accurate test or measurement to assess RMW?

A: The definition of RMW is that the respiratory muscle strength is reduced to equal or less to 70% of predicted value, assessed by maximum inspiratory or expiratory strength (MIP/MEP). Additional indicators for/manifestations of RMW include dyspnea, reduced exercise tolerance, dysphagia, dysphonia, etc.

Q: What is the recommended training protocol ? What is the training load?

A: Please have a look at our website for specific use case protocols. Our standard training protocol recommends 2 to 3 sets of 10 breaths twice a day at around 70% of maximum effort. However, clinical judgement should be used to tailor the protocol to each individual patient. Several SLPs that we are closely working with recommend for example 5 sets of 5 breath at target effort, if that feels more achievable for the patient. In addition, many patient benefit from a few breaths as a warm up before eating to improve swallow function and reduce aspiration.



Questions



Answers

Q: Does it make sense to vary the inspiratory and expiratory part of RMT (ie do inspiratory or expiratory only)?

A: In most cases it is beneficial to train both parts of the breath cycle. For example, if your inspiratory muscles get stronger by doing inspiratory muscle training and you start increasing your exercise tolerance and being more active, you also want your expiratory muscles to be strong, to then excrete the CO₂ that you're producing, because expiration usually is just passive. So it's really good to get those muscles strong as well. Or for example, if you want to improve your cough effectiveness, you need really strong expiratory muscles, but you also need really strong inspiratory muscles to draw the air in before you produce an effective cough.

However some patients with dysphagia or swallow problems may prefer in some instances to only train the expiratory muscles to really focus on these, your muscles. So before they have a meal, they try to warm up and engage those expiratory muscles just in order to, if they aspirate, really cough out effectively. And it might make sense to do maybe one or two sets of five breaths on a really high expiratory setting. But in general we would recommend to train both parts of the respiratory cycle.



Questions



Answers

Q: I am wondering if you would be able to compare The Breather to EMST-150, specifically in terms of improving swallowing physiology?

A: In contrast to the EMST-150, the Breather strengthens both inspiratory and expiratory muscles to improve swallow physiology. Breather and Breather Fit offer a wider range of pressures that can be generated and may therefore be suitable for a more expansive patient range. Based on these assessments, benefits of both devices should be comparable, with the added benefit of strengthening the inspiratory muscles, causing reduction in dyspnea and increasing exercise tolerance, by the Breather. The Breather has been used extensively in patients with swallow impairment.

Q: Are you aware of any community support groups that help discharge patients be successful? My thought is around a community chronic disease support group.

A: The American Lung Association has support groups across the nation. Info can be found on their website and they may have a local chapter for you. Many senior centers offer groups related to diagnosis as well.



Questions



Answers

Q: How does the Breather compare to Incentive Spirometry (IS)?

A: IS helps you to breathe deeply and to learn the proper breathing pattern again, to really take a deep breath. And that helps clearing the lungs and to establish a breathing pattern. But what incentive spirometry doesn't do is to actually improve respiratory muscle strength. So incentive spirometry you doesn't provide any of the benefits that you get from RMT. So you don't get reduced dyspnea, you don't get the exercise tolerance, you don't improve your cough effectiveness.

And it is also been shown the incentive spirometer is used in most institutions still to prevent postoperative pulmonary complications (PPC) such as pneumonia and atelectasis, and that evidence actually is really outdated now. It has been shown that RMT provides much better results here if you use it before surgery or after surgery as soon as possible, upon extubation, that you can really reduce the incidence of PPC by up to 50%. That has been shown. RMT reduces the length of stay, and the length of stay in the ICU. So especially in the perioperative setting the incentive spirometer should really be replaced by RMT. If your patients really like to use the incentive spirometer, by all means continue using it. But we really recommend that you maybe have a respiratory muscle training as an adjunct therapy there, and to actually get them to improve the respiratory muscle strength.



Questions



Answers

Q: Can RMW be determined without using a manometer?

A: While a bona fide diagnosis of RMW can not be confirmed without establishing MIP or MEP using a manometer, the underlying diagnosis, patient history and present symptoms can give a good indication of RMW. While dyspnea and exercise intolerance are good indicators for RMW, additional symptoms such as fatigue and reduced hr QOL may also imply the presence of RMW. Dr Aldarondo may want to elaborate on that.

Thank you Nina, the presence of increased respiratory muscle work as well as cachexia may be predictors of established RMW. As RMT has no side effects, it should be considered in all cases of suspected RMW due to its beneficial effects.



Questions



Answers

Q: What is the difference between resistive and threshold devices?

A: With a threshold device, you have to overcome an initial pressure to open a valve, and that's the target pressure. Once the valve is opened, there is no resistance to the airflow anymore.

The difference to resistive devices like The Breather is that the resistance that your muscles are working against is constant throughout the entire breath cycle, so your inspiratory and expiratory muscles are working for the entire 2 to 3 seconds during inhale and during exhale. This puts a more sustained workload on the muscles.

In 2019, this was demonstrated in a study commissioned by Dr Watts of **Texas Christian University**. They confirmed considerable muscle activation using sEMG during both inspiration and expiration through The Breather. [Texas Christian University Clinical Study \(Poster\)](#)

Direct comparisons between both methods have shown that both threshold and resistive devices strengthen the respiratory muscles, but that the curve of activation looks different, confirming this sustained muscle activation with resistive devices such as the Breather.

[Read The Evidence Of Resistive Vs Threshold](#)



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Questions



Answers

Q: Benefit of RMT To Reduce The Work Of Breathing Work of Breathing?

A: RMT reduces the work of breathing by improving respiratory muscle strength and ventilation. Direct evidence for reduced work of breathing due to Respiratory Muscle Training (RMT) has been provided by studies in COPD patients (<https://www.physiology.org/doi/abs/10.1152/jappl.1988.65.6.2726>) and in healthy individuals (<https://www.ncbi.nlm.nih.gov/pubmed/20187286>).

Q: Do you need a prescription?

A: No prescription needed. The Breather is a medical grade product and registered as a Class 1 device with the FDA. Click here for quick access to the Breather: <https://www.pnmedical.com/product/the-breather/>

Q: Is it covered by Medicare?

A: Medicare does not cover The Breather or any other RMT device; however, RMT may be covered if prescribed by a healthcare provider (used for therapeutic exercise; treatment of speech, language, voice, communication; group treatment) Stay tuned to PN Medical emails for an upcoming webinar regarding documentation and reimbursement changes (PDPM and PDGM).



Questions



Answers

Q: Evidence for use of the Breather in Dysphagia?

A: Expiratory muscle strength is essential for optimal cough and swallow function. Strengthening of the expiratory muscles by regular application of the Breather can alleviate the symptoms of dysphagia by improving cough volume and acceleration, and reduces the risk of penetration and aspiration associated with dysphagia. Please see our website for further evidence:

<https://www.pnmedical.com/category/therapeutic-use/speech-swallow/>

Q: How is this related to SLP scope of practice to increase participation with PT if dysphagia and effective communication isn't the target?

A: In the example, the SLP evaluated the patient and determined breath support was a deficit impacting communication and quality of life. Communication is within the SLP scope of practice. Further, treating this underlying impairment also impacted their functional endurance increasing PT and OT participation.

Q: In order to maintain a consistent pressure within the airway, do you encourage a nose clip with the mouthpiece, or a mask to seal off the nose?

A: We recommend using nose clips and monitoring a tight seal of the lips around the mouthpiece to ensure consistent airway pressure.



Questions



Answers

Q: Are there any studies related to using the RMT with a partially paralyzed diaphragm?

A: Yes, there are 2 case studies demonstrating the benefits of RMT on diaphragmatic paralysis:

<https://www.ncbi.nlm.nih.gov/pubmed/19111633>,

https://www.atsjournals.org/doi/10.1164/ajrccm-conference.2019.199.1_MeetingAbstracts.A3744, as well as a clinical study showing that RMT effectively reverses diaphragm asymmetry after stroke: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4668180/>.

Q: Why is Breather not recommended for patients with Myotonic dystonia and how can it be modified for this client group?

A: There have been no clinical investigations in the use of RMT for myotonic dystonia. Use of the Breather for respiratory muscle strengthening is only recommended under strict supervision of the attending physician in order to prevent respiratory muscle fatigue or overexertion.

Q: Contraindications

A: During initial training, we recommend careful monitoring for episodes of acute exacerbation or excessive fatigue. Caution is advised before initiation of therapy for: active hemoptysis, untreated pneumothorax, recent esophageal surgery, acute upper airway stenosis (true vocal fold mass, vocal fold paralysis in adducted position, subglottic stenosis), recent oral, facial or skull trauma / surgery, acute sinusitis, epistaxis, hemodynamic instability, tympanic membrane rupture or acute middle ear pathology (otitis, labyrinthitis).



Questions



Answers

Q: What about issues of having the Breather stick?/Whistle sounds/defective device?

A: Most issues of “sticky” diaphragms on the Breather or whistle sounds derive from inadequate or insufficient cleaning of the device. Please visit our website for manufacturer’s recommended cleaning:

<https://www.pnmedical.com/lessons/breather-how-to-clean/> Should the problem persist, please contact our customer service.

Q: I have pulmonary hypertension which is presumed to have been caused by undiagnosed sleep apnea. Will the Breather help? I do use a CPAP machine now.

A: Yes, RMT has been shown for sleep apnea, improving both quality and quantity of sleep, especially in mild to moderate cases: <https://www.pnmedical.com/therapeutic-use/other-diseases/effect-of-rmt-on-sleep-architecture-in-obstructive-sleep-apnea/>.

In addition, RMT has proven effective in Pulmonary Hypertension (https://erj.ersjournals.com/content/52/suppl_62/PA1718), so the Breather may offer a holistic approach to both disorders here.



Questions



Answers

Q: I have a hole in my neck from the removal of a trach. is it safe for me to use the Breather? If you were intubated 2+ years ago and the opening in your neck has not completely closed, is it still okay to use the Breather? The hole from the intubation will eventually need surgery. Should The Breather training be put off until the surgery can be completed? Would it be harmful to use The Breather before the surgery ?

A: Use of The Breather may be possible if you are able to cap or close the trach stoma during RMT. Please discuss with your surgeon/physician for confirmation related to your individual condition and guidance.

Q: How does the patient know when they are using 60% capacity. I have a breather and don't know how to measure effort.

A: For accurate measurement, a manometer can be used in series with the Breather. Accessory kits are available from: (<https://voiceaerobicsdvd.com/product/rmt-accessory-kit/>). However, subjective effort perception is normally sufficient for training success: AT 60% of maximum capacity, one set of 10 reps through the Breather should feel “somewhat hard”, with the potential of doing another 3 to 4 reps at the same setting before getting out of breath. If you can do another 10 reps without break, the settings are too low, if you can't finish a set of 10, it's too high. Always remember that inspiratory and expiratory setting should be determined and set independently of each other, as inspiratory muscles often gain strength quicker than expiratory muscles.



Questions



Answers

Q: How can a multidisciplinary team screen for possible benefit from respiratory muscle training and identify which discipline would be best to target it? (without tools to assess)

A: Best guidance is the primary diagnosis or chief complaint. For example, in the case of dysphagia as chief complaint, Speech Therapy would be the most suitable discipline to apply RMT. In the case of dyspnea and exercise intolerance due to COPD or heart failure, PT, OT or RT may be suitable - dig deeper to determine what function the intolerance is impacting. There may be times any of the disciplines could address RMW. As an interdisciplinary team, determine which discipline will integrate RMT in treatment while others may play more of a supportive role. For example no RT available, PT provides training in RMT, OT reinforces carryover of use of Breather and logging use with ADL training. For quick access to the training log visit: <https://www.pnmedical.com/wp-content/uploads/2019/03/The-Breather-Training-Journal-4-Week-Version-1.pdf>

Q: Could you compare/contrast with the emst150?

A: Devices that provide EMT only, which are predominantly used for cough, airway clearance and swallow problems (EMST-150, Resistex), fail to address the importance of the inspiratory muscles for these functions.

While EMT undoubtedly has a beneficial effect on dysphagia and swallowing, studies on people with neurological disease have shown that “(the) number of swallows per bolus and swallowing time correlated to maximal inspiratory pressures (MIPs) but not to maximal expiratory pressures (MEP).” Inspiratory muscle strength therefore is essential for swallowing function, a fact that is widely neglected. The Breather provides both IMT and EMT and offers a more balanced effect, training all respiratory muscles, increasing both MIP and MEP, which should enhance the effect on swallowing function in dysphagia.

Questions



Answers

Q: Would you recommend The Breather to be used with IOPI? Or use one before the other?

A: IOPI measures tongue and lip pressures, which may improve in tandem with respiratory muscles strengthening when RMT is carried out. However, RMT can only establish direct impact on respiratory muscles, not in the tongue and or lip muscles, as there are too many anatomic and functional variables to correlate the two muscle groups.

Q: Would this be recommended for Passy Muir users ?

A: We recommend integrating RMT with using a Passy Muir Valve, since improving RMW and glottic function is expected to improve phonation further.

Q: Is the pressure itself measurable?

A: The pressure generated can be measured by using a manometer in series while using the Breather. Manometer kits for use with the Breather are available from <https://voiceaerobicsdvd.com/product/rmt-accessory-kit/>.



Questions



Answers

Q: Why can't you hold The Breather by your teeth? How does that affect the training?

A: The mouthpiece is ergonomically designed to support people with poor lip strength, and to prevent air leakage due to tighter lip seal. It also stimulates the muscle network around the lips. Holding the mouthpiece by the teeth puts undue pressure on the jaw and makes it harder to achieve lip seal around the mouthpiece.

Q: I've had my Breather for awhile now and I am at setting 6 inhale & 5 exhale. I assumed I should simply just continue, at these settings, for my maintenance, correct?

A: Congratulations on getting your respiratory muscles into great shape!

Good news, you can continue improving your strength! We offer the Breather Fit for athletes and people who start RMT from a higher baseline. **Breather Fit** offers higher training intensities due to increased resistance at each setting, which could take your respiratory muscle strength to the next level. Check it out here: <https://www.pnmedical.com/product/breather-fit/>



NEXT EPISODE



Algorithm for the Application of RMT During Mechanical Ventilation Liberation

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