

# Multiple Sclerosis and Respiratory Muscle Weakness

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## Fact Sheet

Impairment of respiratory muscles, or muscles that control breathing, in people with Multiple Sclerosis (MS) is common. It has been found that 64% of people with moderate disability and no difficulty walking having respiratory muscle weakness. However, respiratory muscle weakness and impairment in lung function typically occurs later in the disease process/advanced stages and is associated with more severe disability and difficulty walking. Respiratory muscle weakness can lead to worsening performance with coughing. People with MS may also have difficulty swallowing (dysphagia) which combined with respiratory dysfunction may result in aspiration pneumonia.

### Respiratory function is important to keep your body strong

- Neck and chest wall muscle strength is required to expand the chest wall to allow the lungs to expand when you breathe in. When the lungs fill with air, the blood vessels in the lungs absorb oxygen necessary for your body to function well. If the muscles that expand the chest wall are weak, the lungs cannot expand fully, and less oxygen gets into our blood.
- Abdominal muscle strength is required to achieve a forceful cough. This is necessary to remove mucus from the lungs when you have a respiratory infection. Also, abdominal muscle strength, different from the kind of strength achieved with sit ups, is needed for loudness and endurance of speech.

Respiratory muscle weakness in persons with MS is caused by neurological impairment, physical inactivity and/or respiratory complications. Postural changes such as contractures of the joints in the ribs and changes to the spine may also lead to decreased space for air exchange. It is helpful to determine the cause of the respiratory muscle weakness to seek the proper treatment.

### When should respiratory muscle strength be tested?

If you have MS and have trouble breathing, shortness of breath, or have a weak cough on a regular basis, testing of respiratory muscle strength is indicated. It could also be helpful to have respiratory muscle strength tested prior to feeling these symptoms to help monitor changes in your breathing over time.

### How is respiratory muscle strength tested?

Physical therapists and respiratory therapists test respiratory muscle strength and endurance. The amount of air you breathe in and out will be measured as you breathe into or out of a large tube that is placed in your mouth.

### Overall, the benefits of respiratory muscle strength training are

- Better strength of the muscles that help you breathe
- Better muscle endurance of the muscles that help you breathe
- Less overall fatigue
- It may contribute to:
  - better walking endurance
  - better cough ability to prevent aspiration pneumonia

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## How can physical therapy improve respiratory muscle strength and endurance?

Just like other muscles in your body, the muscles you use for breathing can be strengthened with exercises. Your physical therapist can assist you in putting together an exercise program that fits your needs. The rehabilitation for breathing might be called expiratory or inspiratory muscle strength training. This program will include the following steps:

1. Selection of an inspiratory or expiratory trainer.
  - Resisted inspiratory training is recommended if you have shortness of breath or low oxygen levels in your blood.
  - Resisted expiratory training is recommended if you have a weak cough.
  - A trainer offering low resistance is recommended in most cases. Such as:
    - Threshold Inspiratory Muscle Trainer from Phillips®
    - Powerbreathe (LR) Level 1 from Power-breathe®
    - PowerLung Breatheaire®
    - The Breather® from PN Medical
2. Determine the resistance level needed.
3. Instruction on how to progress the resistance training.

Most respiratory muscle training programs take only 10 minutes/day to do.

If you are already experiencing signs of difficulty breathing, weak cough or difficulty clearing secretions it is recommended to seek medical evaluation to begin appropriate training. It has been shown that earlier evaluation can improve your breathing over time.

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