

Breath stacking is a breathing exercise that can benefit people who are losing lung capacity due to muscle weakness or other restriction in chest movement.

### **What are the benefits?**

- Breath stacking serves to increase the amount of air that can be moved in and out of the lungs. It works by opening up areas of the lung that are prone to collapse while exercising the lung tissue and chest wall, keeping them flexible. If more air can be taken into the lungs it results in improvements in ability to cough and speak.
- Preventing lung collapse is important for preventing infection. Areas of the lung that are not properly opened are prone to developing pneumonia.
- Collapsed lung tissue will not perform as needed. If no air is able to reach the end of the airway, then oxygen will not be taken in and carbon dioxide will not be released, resulting in an added burden on the body.

### **What do I need?**

Breath stacking can be done using a resuscitator that has been modified. A resuscitator, commonly known as a “bag,” is a simple device used to give artificial breaths to people who are too ill to breathe on their own. A one-way valve, an extension tube, and either a mask or mouthpiece are added to modify the bag for breath stacking. With these extra attachments, the bag is no longer suitable for resuscitation, and can ONLY be used for breath stacking.

### **Caution:**

If you experience dizziness, chest discomfort or chest pain, stop breath stacking and rest. If done properly, breath stacking should not result in any of these symptoms.

### **How is it done?**

- It is best done sitting, but can be done reclining or lying flat. Whichever position is used, there should be no slouching.
- Nose clips can be used to prevent air from escaping.
- Take a deep breath.

- Place lips tightly around the mouthpiece or have your caregiver hold the mask firmly on your face.
- Take more air in as the bag is squeezed.
- Try to take in even more air as the bag is squeezed again.
- When your lungs are at maximum capacity you should feel a stretch across the front of your chest.
- Hold the air in as long as is comfortable, then let it go. You can use this air to generate a cough.

### **Assisted cough technique:**

Once the lungs are at maximum capacity a more powerful cough can be generated using this technique.

This can be done with a helper who performs an abdominal thrust in coordination with your cough. If an abdominal thrust can't be done, then the helper's hands can be placed around the lower rib cage and pressure can be applied as you cough.

## Caution:

If you are sitting in a chair, make sure it is secure prior to the abdominal thrust being performed. It may even be wise to put the back of the chair up against a wall so there is no chance it will tip over.

## When should breath stacking be done?

Breath stacking is best done before meals and at bedtime. An empty stomach allows the diaphragm to move more easily and more comfortably. Also, performing an abdominal thrust on a full stomach could result in vomiting.

## How often should it be done?

Breath stacking should be done three to five times daily, inflating the lungs maximally three to five times at each session. Breath stacking should not be done more than every ten minutes since hyperventilation may occur.

## Helpful hints:

If a helper is needed to squeeze the bag, maintain eye contact to help him/her coordinate squeezing the bag with your inhalation and/or coordinate assisting your cough. Regular breath stacking is of benefit even when an assisted cough is not added. You may find with regular breath stacking that an assisted cough is needed as little as once daily.

## Resources:

**A Manual For People living with ALS, 3<sup>rd</sup> Ed.** Jane McCarthy, Ed. ALS Society of Canada, Copyright 2005 [www.als.ca](http://www.als.ca)

Ottawa Rehabilitation Center,  
[www.rehab.on.ca](http://www.rehab.on.ca)  
(Online Education, Respiratory Care Protocols, Interventions)

# Breath Stacking and Assisted Cough Techniques

Information provided by the ALS Clinic of  
McMaster University Medical Centre  
Hamilton, Ontario  
(905) 521-2100 X73731



McMaster University  
Medical Centre

Caution: If you have emphysema or other lung disease, please discuss this information with your health care professional before proceeding

