

## CPT – Educational Group Effective Breathing/ Coughing

### **Purpose**

- To conserve energy and decrease fatigue
- To remove mucus from airways
- To prevent respiratory complications
- To increase expiration of air
- To decrease air trapping
- To increase lung expansion
- To decrease shortness of breath

### **Admission Criteria**

Free of communicable disease / isolation precautions

Stable Vital Signs

Able to sit for at least 30 min

Able to follow 2 step commands

### **Suggested Materials**

Handouts- COPD Huff cough technique

Computer screen with audio if watching Huff cough technique video (2 min)

Pillows

Patients with incentive spirometers can bring their devices to group

Tissues, Small Basin

Pulse oximeter

Printed picture of Lungs, review anatomy/ physiology

### **Suggested Activities:**

Review Airway Anatomy

Watch video of Huff technique

Return demonstration of breathing and/or coughing techniques

Practice use of incentive spirometer if previously prescribed/issued to patients in group

**Procedure for diaphragmatic or abdominal breathing:**

- Lie on your back with a pillow under your head and with knees slightly bent over a pillow
- Clear airway passages first with coughing
- Press one hand lightly on abdomen and rest the other hand on the chest
- breathe in slowly through your nose letting abdomen protrude
- The hand on the stomach should rise during inspiration and fall during expiration while the hand on the chest should be almost still

**Procedure to demonstrate and practice pursed lip breathing:**

- Breathe in slowly through the nose, counting to three while keeping mouth shut
- Exhale through pursed lips (as if blowing out a candle), counting to seven
- Breathing out should take at least twice as long as breathing in
- When doing pursed lips breathing during an activity, breathe in before exertion and breathe out doing the activity
- The client/caregiver can list methods to practice
  - ◆ Blow bubbles / or through a straw into a glass of water to form bubbles
  - ◆ Blow a tennis/ ping pong ball across a table at a steady pace
  - ◆ Incentive spirometer (if patient has one assigned)

**Procedure to demonstrate and practice counted breathing:**

- Assess usual pattern of breathing by counting seconds required for inspiration and seconds required for expiration
- Breathe out slowly, attempting to increase expiration time
- Then breathing should be coordinated with walking by counting steps taken with inspiration and counting steps taken for each expiration

**Positioning methods for effective coughing:**

- Sit upright on a chair or edge of bed with feet firmly on the floor, leaning forward slightly
- If unable to sit upright, elevate head of bed and flex knees, or lie on the side keeping upper body flexed forward and knees bend toward body

**The client/caregiver can demonstrate controlled coughing:**

- Take a deep breath, placing your hands on your stomach while allowing stomach to expand
- Hold breath for two seconds
- Cough twice with mouth open (the first cough loosens mucus and the second cough helps to remove it)
- Cough mucus into a tissue and dispose of it
- Breathe in slowly through nose (fast mouth breathing can drive mucus back into lungs)

**Demonstrate Cascade coughing, another version of controlled coughing:**

- Take a slow deep breath and contract abdominal muscles
- Hold breath for two seconds

- Open mouth and perform a series of coughs from the beginning to the end of the expiration. This clears large and small airways
- Then breathe slowly through the nose and rest

**Demonstrate Recovery Techniques**

- Stay calm
- Lean forward in sitting or standing to expand diaphragm
- Begin pursed lip breathing- exhale as long as you can
- Attempt Diaphragmatic Breathing

**Other general measures to promote effective coughing and clearing of airways:**

- Take pain medication as needed
- Support Incision with a pillow to decrease pain when coughing
- Increase fluids to 2000ml per day, unless contraindicated, to thin mucus
- Use medications as directed

**Complications of ineffective coughing:**

- Collapse airway
- Rupture alveoli
- Pneumothorax

## **THE HUFF COUGH TECHNIQUE**

### **Watch short 2-minute video prevention:**

<https://www.bing.com/videos/search?q=huff+cough+video+instructions&view=detail&mid=8A132EE8907FDB7461F68A132EE8907FDB7461F6&FORM=VIRE>

Coughing is one of the most important lung defense mechanisms, and unfortunately it is significantly impaired in COPD. While the nasal passages provide a mechanism to warm and humidify the incoming air, and trap dirt particles and germs, inevitably some undesirable foreign material penetrates down into the lungs. Coughing is needed to clear undesirable material from the bronchial tubes. This module will teach you a more efficient way to do a COPD cough, called “**Huff Coughing**.” To understand Huff Coughing you first need to have some understanding of normal coughing.

### **The Normal Cough**

With normal coughing you take in a deep breath, then close the vocal cords in your throat “**Voice Box**” (called the “**Glottis**”) to shut off air flow from the lungs. Then, straining with your chest and abdominal muscles you build up a high expiration pressure in your lungs. At this juncture the “**Cough Center**” in the brain initiates an abrupt opening of the Glottis, which then produces an explosive blast of air from the lungs that propels the mucus (called “**Phlegm**” or “**Sputum**”) out as an expectoration.

### **The Impaired Cough of COPD and Emphysema**

Unfortunately with COPD / Emphysema the cough is typically weak. Not only are the muscles building up pressure usually weakened, the airways are narrowed and distorted. Therefore the necessary explosive rush of air for effective mucus clearing cannot be generated. In addition, and very important, your airways are particularly prone to premature collapse. High pressure straining therefore causes rapid and excessive bronchial closure, further impairing the rapid blast of air flow necessary for an effective cough. The Huff Cough technique will teach you a new and more efficient method of coughing.

### **The Huff Cough for COPD and Emphysema**

In contrast to the normal cough, Huff Coughing is a low pressure cough, which uses a series of several “mini-coughs” instead of a typical single big cough. Here is how it is done.

First, it is crucial that you get an adequate volume of air deep into your lungs, past the mucus or phlegm. Without an adequate preparatory volume of air deep in the lungs and behind the phlegm, to force the phlegm out, your cough isn’t going to move much. To get a good breath in, remember the basic rule, that every breath of air must begin by first getting the old stale air out of your lungs. Here there is a special need to get an adequate breath in, though it is not necessary to take in a maximal inspiration breath for coughing. A comfortably large breath should be adequate. If you are feeling the need to cough, it is commonly associated with the condition of

lung over inflation. This is why it is particularly important for you to first have a good exhalation, and then take in that initial deep breath of air for the Huff Cough.

In addition, these deep inspirations and expirations have a massaging or “milking” effect on the bronchial tubes, to further loosen-up and dislodge the phlegm, and prepare it for the Huff Cough to finally remove it from the lungs.

### **The Huff Cough Technique**

To deflate the excess air from your lungs, slow your breathing way down, and do a gentle and prolonged exhalation over three or four breaths. In doing this series of preparatory deflation breaths, don't breathe in a full breath, or you will re-inflate your lungs again. Breathe in only about 75 to 80% of a normal inspiration breath. “Breathing Belt” exercises and the “Respiratory Squeeze” technique, described elsewhere, may be used to advantage here.

Now, take in a slow, comfortably deep breath (but not a maximum deep breath).

At this juncture you must now concentrate on keeping your Glottis (“Voice Box”) open, and with your mouth open and shaped like a loose “O.” With the Glottis and above-glottis structures now kept open, it is impossible to build-up a high pressure cough.

Now, give a short, abrupt, relatively gentle “mini-cough” by a sudden contracting of your upper abdominal muscles. Try to imagine contracting centrally, from just below your ribs down to your umbilicus. If you do this correctly you should produce a soft exhalation sound like word “huff,” hence the name Huff Cough. You should not speak the word Huff, but rather make the “huff” noise. Note how different this is from the typical sharp, barking, explosive sound of a normal cough. The character of the huffing sound is a good indication to you and your caregivers as to your effectiveness in performing the technique properly.

Remember, the moment you produce the Huff Cough you will also initiate some excessive bronchial compression, which will immediately impair phlegm clearing. This is why the Huff Cough must be kept very short. But this bronchial compression is not as bad as with a traditional hard cough, particularly if it is a repetitive cough, as this “normal” cough will cause much more dynamic bronchial closure, and therefore wasted energy with little further mucus production.

Now, at the end of the Huff, take in a quick partial breath of air, and try to feel this being sucked into the bottom of your chest. This is to again put some air out past the offending mucus, and to open up the collapsed airways, in preparation for the next Huff Cough. Do not take in a deep breath as you did at the beginning of this exercise.

Now, repeat the Huff Cough a second time, this time with this smaller breath.

Again, abruptly take in a still smaller partial breath, and repeat the Huff Cough for a third time. Some times patients may feel difficulty in getting-in that third Huff Cough, and if so then do only two Huff Coughs.

At this juncture, at the end of the Huff Cough sequence, with progressively smaller cough volumes, you should feel that most all of the air is out of your lungs. This is because you were not taking in the same sized deep breaths between the Huff Coughs. Note that by doing this series of decreasing lung volumes you will help to further “milk” and squeeze phlegm from your lungs.

Next, take in a forced, full (but not maximally full) breath of air deep into the bottom of your lungs.

Now, keeping the Glottis open, give a single, hard, **FORCED** Huff Cough. This forced breath should result in phlegm being produced to where it can be expectorated.

What has happened here is, the two or three (preferably three) Huff mini-coughs have loosened peripheral small bronchial mucus, and progressively brought it into the large bronchial tubes, and the single larger **FORCED HUFF** cough results in final expectoration.

### **Failure to finally expectorate your phlegm**

Sometimes the final forced Huff Cough brings sticky mucus only part way up, where it “hangs-up” in your large airways and causes a further coughing attack. This can be hard to control and very distressing. If you are in this situation, don’t panic and try to force the phlegm out with a series of hard coughs.

Stay calm, and try to suppress your coughing spasms. Concentrate on doing slow, deep breaths with a long expiration time. You may also do Pursed Lip Breathing to help your dyspnea. Rest yourself, and regain your strength. A sip or two of water often helps with cough control.

Almost always this situation produces a temporary state of lung overinflation, so it is very important for your recovery that you concentrate on lung deflation as noted above. Then, repeat the Huff Cough sequence as needed.

As sticky phlegm is often the culprit causing this problem, increase your clear fluid intake for the next few days, until your urine becomes consistently less yellow, as an indication of adequate general hydration. This is done to moisten the phlegm and encourage looser sputum.

Remember, always immediately examine your sputum at least twice a day, and particularly the first morning sputum. This should be done in a tissue to enable close inspection. If you suspect you are developing a “Chest Cold” bronchial infection you should examine all of your phlegm for signs of progressive infection.

It is very important that you know what your “normal” phlegm looks like. This must be done to permit recognition of early bronchial infections. Examine all sputum if it is suddenly getting less in amount, or thicker or stickier, or if it becomes slightly opaque, or dirty yellowish or greenish appearing. This may be the warning signal of early bronchial infection, a so-called “Bronchitic Exacerbation.” This may require prompt medical attention to prevent a more serious bronchial or lung infection. More on this important topic in another module.

### **Huff Cough technique Summary**

In summary, the sequence of the Huff Coughing technique is:

- Lung Deflation (several breaths, or with Breathing Belt and/or Respiratory Squeeze assist).
- Deep breath in.
- Huff Cough #1, with lung deflation, followed by rapid partial inspiration.
- Huff Cough #2, with further lung deflation, followed by rapid partial inspiration.

- Huff Cough #3, with still further lung deflation, down to near the bottom of your lungs.
- Deep breath in.
- Single abrupt FORCED HUFF cough, for final expectoration.
- Repeat as necessary after a brief rest if clearance is not complete.
- Examine your sputum in a tissue, at least twice a day.

Reference:

<https://www.copdsupport.ie/about-copd/how-to-manage-with-c-o-p-d/controlled-coughing/cough-technique>