

## Patient Info

### Manually Assisted Cough (MAC)

#### What is MAC?

Manually assisted cough (MAC) is a technique using strong arms to assist your cough. MAC may be helpful if you have a neuromuscular disease or spinal cord injury with weak breathing muscles. MAC is applied when your lungs feel full and usually will increase the strength of your cough.

You must be alert when using MAC. If you use it when not alert, you may cause physical pain.

#### Why would you do MAC?

You use MAC to:

- + Start a stronger cough to help clear or prevent mucus from collecting in your lungs; and
- + Prevent lung infections.

MAC is best when your lungs feel full with maximum air volume. Breathe in air volume beyond what you can achieve on your own, using lung volume recruitment (LVR) techniques. These include the LVR bag (breath-stacking bag), the mechanical coughing machine, a breathing machine (ventilator) with a mouthpiece or glossopharyngeal breathing (frog breathing).

If you have a lower spinal cord injury a deep breath on your own before MAC may be all you need.

#### When do you do MAC?

You can do MAC once or twice a day. More often if mucus is present. It is best to do MAC before you eat and at bedtime to avoid the flowing back of liquid from your stomach. Ask your doctor if you are a candidate for the MAC technique.

If you have to do MAC to the point of fatigue, notify your doctor. You may have an infection.

#### How should you do MAC?

The following MAC techniques are most common:

- A. Abdominal Thrust;**
- B. Lateral Costal Compression** (side by side rib squeeze); and
- C. Self-assisted Cough.**

- + **Abdominal thrust and lateral costal compression techniques** are best when you are sitting or semi-lying with your head slightly elevated;
- + If sitting in your wheelchair, position your chair against the wall, lock the wheels and make sure hips are as far back in the chair as possible;
- + Your back and head are stable, and your body is in a straight position; and
- + If necessary, place a rolled towel or pillow just below the shoulder blades to open up your chest.

## A) Steps for Abdominal Thrust

1. Before starting, explain to your helper how to assist with your cough. It is important that when doing the abdominal thrust, the pressure exerted by the forceful arms is firm, quick and coordinated with a cough.
2. The helper moves in position as follows:
  - a) places index fingers on the individual's hip bones;
  - b) slides the thumbs towards the belly button;
  - c) places the heel of one hand, one inch above the belly button;
  - d) places the other hand on top of the first hand with fingers interlocked with straight elbows, and fingers away from ribs or chest.
3. Once your helper is in position, take a deep breath or add as much air as possible to your lungs using a lung volume recruitment technique. When your lungs feel full, hold your breath.
4. At your helper's command of "cough", start a strong cough while your helper applies one quick, forceful push inward and upward through the abdomen.
  - + The helper must shift their body weight forward with straight elbows.
  - + If the thrust is not strong enough, mucus may be difficult to cough or spit from your throat or lungs.
5. Spit out and wipe the mucus with a tissue or remove with a suction tip.



### **DO NOT use abdominal thrust in the following conditions:**

- + **Abdominal aneurysm:** abdominal aortic aneurysm is an enlarged area in the lower part of the aorta, the major blood vessel that supplies blood to the body
- + **Acute bleeding ulcer:** open sores in the upper part of the digestive tract that can cause stomach pain or stomach upset, or internal bleeding
- + **Pregnancy**
- + **Recent abdominal surgery**

### **Consult your doctor if you have a:**

- + **Vena cava filter:** A vena cava filter is a device placed into a major vein to prevent a blood clot from entering the lungs; the thrust may move the filter
- + **New feeding tube:** inserted less than 48 hrs

## B) Steps for Lateral Costal Compression (side by side rib squeeze)

1. Consider this method if the abdominal thrust is not possible. The side by side rib compression method is best if you have belly fat.
2. To apply the lateral costal compression (side by side rib squeeze), the helper places hands on your lower ribs with fingers pointing to the back.
3. Once your helper is in position, take a deep breath or add as much air as possible to your lungs using a lung volume recruitment technique.
4. At your helper's command of "cough", start a strong cough while your helper squeezes the ribs up and in.
5. Spit out and wipe the mucus with a tissue or remove with a suction tip.



**DO NOT use the side by side rib squeeze if you have one of the following conditions:**

- + **Osteoporosis:** brittle and fragile bones
- + **Rib injuries:** fractures, bruising or cancer

**Caution, side by side rib squeeze may be less effective if you have:**

- + **Kyphoscoliosis:** permanent curve in the spine

## C) Steps for Individual Self-Assisted Cough

You must have strong arms and good balance to do the self-assisted cough technique. Tie your seat belt if you use a wheelchair.

1. Take a deep breath or add as much air as possible to your lungs using a lung volume recruitment technique.
2. When your lungs feel full, hold your breath. Cough forcefully and throw your upper body forward over your arms while hugging the abdomen.
3. Spit out and wipe the mucus with a tissue or remove with a suction tip.



Visit our website and watch a video demonstration

[www.canventottawa.ca](http://www.canventottawa.ca)