



**SPIROMETRY:** COPD'S MAIN DIAGNOSTIC TOOL .....1



**UNDERSTANDING OXYGEN AND THE BODY:** HOW THE OXYGEN TRANSPORTATION SYSTEM WORKS. ....1



**COPD PEOPLE:** MARY LAYTON—FORMER MEDIA DIRECTOR AND CO-FOUNDER OF COPD CANADA. ....7

# Living with COPD

## Understanding oxygen and the body

The process of getting oxygenated blood to the muscles and tissues and then returning the partially de-saturated blood to the lungs is often referred to as the oxygen transport system.

**T**his system includes the airways, lungs, pulmonary circulation, heart, blood and peripheral circulation. It involves diffusion, gas exchange, and oxygen extraction. If any portion of this process fails or is limited in its efficiency the system will try to compensate for the impairment. The body is very responsive to changes in oxygen consumption and as such it maintains a considerable reserve of oxygen. This reserve can be severely compromised by disease. Oxygen consumption is normally 23 per cent of oxygen delivery—to meet resting metabolic demands.

The rate of oxygen consumption and carbon dioxide production varies with one's level of activity. Vigorous exercise can increase the demand of the muscles and tissues for oxygen by 20 to 25 times. This increased demand is met by increasing the rate and depth of breathing. The major role in regulating breathing is a rising concentration of carbon dioxide, not a declining concentration of oxygen. The concentration of CO<sup>2</sup> is monitored by a part of the brain stem called the medulla oblongata. The medulla oblongata is

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## Chronic Obstructive Pulmonary Disease Spirometry: The Primary Diagnostic Tool for COPD

**A** spirometry test is the primary diagnostic tool in COPD. Spirometry (meaning the measuring of breath) is the most common of the pulmonary function tests (PFTs), measuring lung function, specifically the amount (volume) and/or speed (flow) of air that can be inhaled and exhaled.

The spirometry test is performed using a device called a spirometer, which comes in several different varieties. Most spirometers display graphs, called spirograms, which graphically depict the rate of airflow on the Y-axis and the total volume inspired or expired on the X-axis.

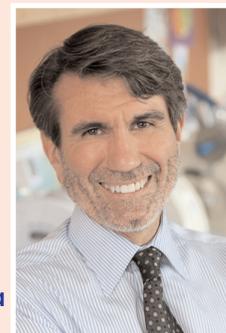
The basic forced volume vital capacity (FVC) test varies slightly depending on the equipment used. Generally, the patient is asked to take the deepest breath they can, and then exhale into the sensor as hard as possible, for as long as possible, preferably at least six seconds. It is sometimes directly followed by a rapid inhalation (inspiration), in particular when assessing possible upper airway obstruction. Sometimes, the test will be preceded by a period of quiet breathing in and out from the sensor

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### Ask Dr. Chapman

by Kenneth R. Chapman, MD, MSc, FRCPC, FACP

Director of the Asthma and Airway Centre of the University Health Network, Toronto



**Q** Last winter, I had a bad bout of bronchitis that made my COPD much worse for two or three months. My family doctor has told me to "get in touch right away" if that happens again so that he can treat the problem quickly. At a recent visit with my respirologist, I was told that I should have medicine available—an antibiotic and prednisone—to allow me to start treatment on my own. I have the prescriptions now but don't know when I should use them.

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## Ask Dr. Chapman

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**A** This question highlights one of the more controversial issues in the COPD field. Those “bouts of bronchitis” are what lung specialists call exacerbations or sometimes “lung attacks”. When patients with COPD have frequent exacerbations, we know that they are at risk of losing lung function more rapidly, developing disability more rapidly and losing their lives to the disease. An exacerbation may be mild and respond to outpatient treatment with simple prescription medicines. Even then, patients may find that they are more disabled than usual for two or three months afterwards. More severe exacerbations may require an emergency room visit, hospitalization or even a stay in the intensive care unit. We know that treating these episodes earlier can make them milder and shorter in duration. Typically, doctors will use antibiotics and prednisone for these episodes. These medicines have small but useful effects.

There is evidence that treating earlier is better than treating later. Although doctors may have the best of intentions when they instruct patients to “get in touch right away” it’s often difficult for patients to see their family physicians soon after the symptoms have begun. A delay of even two or three days can make a big difference to the outcome of an exacerbation. Giving patients medicine in advance can allow them to start such medicine as soon as they recognize an exacerbation is underway. The benefit of this strategy was established in a research trial by Dr. Jean Bourbeau and his colleagues nearly a decade ago. They showed that patients with a self-management plan and access to a nurse coordinator by telephone had 40 per cent fewer hospitalizations due to their COPD. However, it’s not clear that we can achieve the same benefits by giving medicine to patients without also giving them access to healthcare professionals to guide them through the assessment and treatment process. Some studies of self-management plans have shown no benefit and even the potential for worse outcomes.

### Action plans in COPD

If your physician has advised you to begin treatment with medicine as soon as you detect an exacerbation is underway, you should clarify with your physician exactly what symptoms you should be looking for and how long you should wait before initiating the treatment. In general, the advice is for patients to consider self-treatment when sputum production changes in an important way—increasing or decreasing in volume, increasing in stickiness (viscosity) or, most important, changing in color. If these changes in sputum are accompanied by breathlessness and the changes persist for longer than 48 hours, you may be at the beginning of an important exacerbation that needs early treatment. Follow the instructions you were given and see a physician as soon as is reasonable to make sure that you are on the mend and that the recommended treatment is doing the job. It may also be helpful to bear in mind that not all increases in breathlessness are due to an infection triggering exacerbation and that antibiotics

and prednisone are not always the right treatment for an increase in breathing difficulties. That is why the instructions from your doctor should be clear and detailed. You can suggest to your doctor that he or she help you to take the correct steps by completing a COPD action plan such as the one that can be downloaded from the Canadian Thoracic Society/Canadian Lung Association website: <http://www.respiratoryguidelines.ca/updated-cts-copd-action-plan>.

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**Dr. Chapman is Director of the Asthma and Airway Centre of the University Health Network, President of the Canadian Network for Asthma Care and Director of the Canadian Registry for Alpha1 Antitrypsin Deficiency. A graduate of the University of Toronto and a former member of the faculty at Case Western Reserve University, he is now a Professor of Medicine at the University of Toronto.**

*We invite your questions. Please mail questions to: Ask Dr. Chapman, c/o COPD Canada, 555 Burnhamthorpe Road, Suite 306, Toronto, Ont. M9C 2Y3. Or you can e-mail questions to: AskDrChapman@gmail.com*

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**Spirometry continued from Page 1** (tidal volume), or the rapid breath in (forced inspiratory part) will come before the forced exhalation.

During the test, soft nose clips may be used to prevent air escaping through the nose. Filter mouthpieces will also be used to prevent the spread of microorganisms.

### Limitations of Test

The test is highly dependent on patient cooperation and effort, and is normally repeated at least three times to ensure reproducibility. Also, due to the patient cooperation required, spirometry can only be used in patients who are able to understand and follow instructions—thus, these tests are not suitable for patients who are unconscious, heavily sedated, or have limitations that would interfere with vigorous respiratory efforts. Other types of lung function tests are available for unconscious persons. A sudden decrease in FEV1 or other spirometric measure in the same patient can signal worsening control, even if the raw value is still normal. Patients are encouraged to record their personal best measures. Although spirometry is the primary diagnostic tool in COPD, your doctor will likely perform other investigational studies during their initial assessment.

### Other Pulmonary Function Tests

In addition to spirometry, there are two other pulmonary function tests important when evaluating lung function in COPD: lung diffusion tests and body plethysmography. These tests measure the diffusing capacity of the lungs for carbon monoxide and the volume of air in the lungs at different stages of breathing, respectively.

### Chest X-ray

A chest X-ray alone does not establish a diagnosis of COPD. Your doctor may order one initially, however, to rule out other reasons for your symptoms or to confirm the presence of an existing comorbid condition. A chest X-ray may also be used periodically throughout your treatment to monitor your progress.

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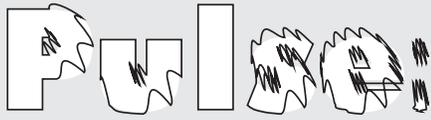
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# News about COPD

## Women Smokers Face Increased Risk of Lethal Stroke

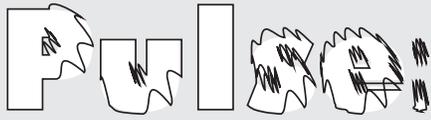
■ **Queensland, Australia** / Men and women who smoke face similar stroke risks, but female smokers may be at greater risk for a more deadly and less common type of stroke, according to a new study. Researchers examined data from more than 80 international studies published between 1966 and 2013 and found that smoking is associated with a more than 50 per cent increased risk of ischemic stroke in both men and women. An ischemic stroke is the most common type of stroke, and occurs when a blood clot blocks blood flow to the brain. But women who smoked were 17 per cent more likely to suffer a bleeding (hemorrhagic) stroke than men who smoked, according to the findings. Hormones and the way nicotine affects blood fats may explain the increased risk for bleeding strokes among women who smoke, the study authors said. They noted that women who smoke have greater increases in fats, cholesterol and triglycerides than men who smoke. "Cigarette smoking is a major risk factor for stroke for both men and women, but fortunately, quitting smoking is a highly effective way to lower your stroke risk," said study lead author Rachel Huxley, a professor in the School of Population Health at the University of Queensland, in Australia. Although the research showed an association between women smoking and an increased risk of hemorrhagic stroke, it did not prove a cause-and-effect relationship.

 <http://tinyurl.com/jw3hb5y>

## COPD Tied to Tiny Brain Bleeds

■ **Ghent, Belgium** / People with COPD are at increased risk for bleeding in the brain, a new study finds. Researchers looked at 165 people with COPD and 645 people with normal lung function and found that those with COPD were more likely to have what are called cerebral micro-bleeds. The more severe a patient's breathing problems, the more likely they were to have micro-bleeds, according to the study, published online July 19 in the *American Journal of Respiratory and Critical Care Medicine*. Cerebral micro-bleeds are an indicator of disease in the brain's small blood vessels (cerebral small vessel disease), which is an important cause of age-related mental decline and disability. It was known that people with COPD are at increased risk for large vessel disease, but these new findings "indicate that COPD might affect both large and small vessels," study author Lies Lahousse, of Ghent University Hospital in Belgium, said in a journal news release. The results also show that methods of preventing cerebral micro-bleeds in COPD patients need to be developed, Lahousse said. Although the study found a link between having COPD and higher risk of cerebral micro-bleeds, it did not establish a cause-and-effect relationship.

 <http://tinyurl.com/lch5d2a>



## Viral Infection and Specialized Lung Cells Linked to COPD

■ **St. Louis** / Investigators at Washington University School of Medicine in St. Louis have described another link in the chain of events that connect acute viral infections to the development of COPD. Their discovery points to a new therapeutic target for COPD. It is well established that smoke exposure is a major risk factor for COPD, but in this new research, investigators show that the cells that line the airways also can respond to viruses in a way that leads to long-term lung inflammation and mucus production that are typical of COPD. The research reported that a signalling molecule called interleukin-13 (IL-13) was the key driver of excess production of chronic airway mucus after viral infection. The research suggests that previous viral infections of the lung may worsen COPD by stimulating a particular type of lung cell that over-activates the immune system.

 <http://tinyurl.com/l3ejw2>

## New Drug for Patients Covered by Provincial Plans

■ **Dorval, Que.** / Ontario patients suffering from COPD now have access to SEEBRI BREEZHALER (glycopyrronium bromide) 50 mcg with its listing as a General Benefit on the Ontario Drug Benefit (ODB) Formulary. The drug is available in pharmacies province-wide. Glycopyrronium bromide is a long-acting anticholinergic (LAAC) indicated for long-term, once-daily maintenance bronchodilator treatment in patients with chronic bronchitis and emphysema. As an inhaled, steroid-free COPD treatment, it is not indicated for the relief of acute deterioration of COPD. The Ontario government recognized the therapeutic value of Seebri leading to its inclusion on the list of recommended drugs reimbursed by the Ontario Public Drug Program. Other provinces are also providing access to this new treatment; most recently BC and the Yukon have approved coverage.

 <http://tinyurl.com/nhnzv44>

## Homeless Face Hidden Epidemic of Smoking

■ **Boston** / The rate of addiction to cigarettes is extremely high among Americans who are homeless, experts say, and this population needs better access to methods of helping them quit. There are up to 3.5 million homeless people in the United States and three-quarters of them smoke cigarettes, a rate that's four times higher than in the general population. As a consequence, "homeless people seem to be dying of smoking-related causes at high rates," said Dr. Travis Baggett, an instructor of medicine at Harvard University. Baggett has been tracking the health problems of 28,000 homeless people in Boston for more than six years. "Cancer is the second leading cause of death overall [for homeless people] and heart disease is the third leading cause of death overall," he said. "The leading type of cancer death was lung cancer."

 <http://tinyurl.com/pxso5q4>

# COPD and Sleep Apnea

Sleep is the period of greatest physiologic disturbance in COPD and the time of greatest danger as it aggravates the abnormalities of gas exchange and can cause secondary pulmonary hypertension and cardiac arrhythmia.

Typically, individuals with severe COPD have decreased sleep time, less rapid eye movement sleep, and more changes in sleep stage. Poor sleep quality is probably a major factor in the chronic fatigue and impaired quality of life reported by patients with severe COPD. Nevertheless, sleep duration and quality are frequently overlooked in studies that evaluate the effectiveness of therapy on quality of life in individuals with COPD.

The increased prevalence of sleep apnea in COPD is almost certainly the consequence of breathing interruptions having greater impact on oxygen levels in COPD. When healthy individuals snore and snort and don't breathe for 20 seconds at night, their normal oxygen level doesn't change. By contrast, the patient with COPD may start with borderline oxygen levels and the same interruption to breathing leads to a significant drop.

It has not been clear whether or not COPD and the sleep apnea hypopnea syndrome (SAHS) are related. Some studies have found a prevalence of sleep apnea in individuals with COPD that is higher than would be expected in the general population.

Individuals with COPD may demonstrate gas exchange abnormalities when asleep. The mechanism, extent, and significance of these abnormalities have been the subject of much investigation. Sleep desaturation occurs in all sleep stages, but maximum desaturation usually occurs during rapid eye movement sleep.

Another important factor is the change in muscle tone. When we dream, our bodies protect us by paralyzing our skeletal muscles. Otherwise, our dreams would have us crashing into walls and fighting with bed partners. Paralysis in sleep is no problem for the individual with normal lungs—the diaphragm continues to move and the air moves in and out of the chest as needed. For the patient with significant COPD, the trapped air pushes the diaphragm down and flattens it. When it contracts, it doesn't do a very effective job of moving air. During the daytime, this isn't a problem as the skeletal muscles pitch in to help with the movement of air. During REM sleep, the skeletal muscles can't pitch in and the ineffective diaphragm struggles to move enough air.



**Understand Oxygen** continued from Page 1 responsible for controlling several major autonomic functions of the body. If the CO<sup>2</sup> level rises, the medulla responds by increasing one's breathing rate. The smooth muscle in the walls of the bronchioles is very sensitive to the concentration of carbon dioxide. A rising level of CO<sup>2</sup> causes the bronchioles to dilate. This lowers the resistance in the airways and assists in increasing the flow of air in and out.

Under normal conditions, when red blood cells pass through the lungs, 95 to 100 per cent of them are loaded, or "saturated," with oxygen. Oxygen then passes readily from the lungs into the bloodstream and is pumped by the heart to all parts of the body. If you have lung disease or other types of medical conditions, fewer of your red blood cells will be carrying their usual load of oxygen and your oxygen "saturation" will be lower than 95 per cent. When lung disease occurs, oxygen may not be able to pass as readily into the bloodstream. And, if the heart is diseased, it may not be able to pump as much oxygen-carrying blood to the body.

## Supplemental Oxygen

The air around us is made up of 21 per cent oxygen as well as some other gases. Supplemental oxygen that your doctor prescribes is almost 100 per cent medically pure. Because of this, it's considered a drug. Not all COPD patients require supplemental oxygen and your doctor can determine if oxygen will help. Some patients may only need to use extra oxygen during a disease flare-up or infection, and may be able to reduce or stop its use if their condition improves. However, most patients who require extra oxygen to treat their chronic illness will need to continue their oxygen therapy for life. Although long-term oxygen therapy has myriad benefits, it is expensive and intrusive. Effective therapy requires thorough patient education and a steadfast commitment by the patient and often by their caregiver. Many patients need extensive counselling to overcome their reluctance to wearing a nasal cannula, especially in public. Only a small percentage of the millions of people with lung or heart problems can benefit from supplemental oxygen. The only way to know for sure if you need supplemental oxygen is to measure the amount of oxygen in your blood with an Arterial Blood Gas test or Oximetry. Your physician will evaluate your test results and symptoms to determine if you might benefit from additional oxygen. If so, a specific flow (litres per minute) of pure oxygen will be prescribed as well as the length of time you should use oxygen. Be aware that if not taken as prescribed oxygen can cause serious medical problems.

## Before making medical decisions

Your physician should be consulted on all medical decisions. New procedures or drugs should not be started or stopped without such consultation. While we believe that our accumulated experience has value, and a unique perspective, you must accept it for what it is...the work of COPD patients. We vigorously encourage individuals with COPD to take an active part in the management of their disease. You can do this through education and by sharing information and thoughts with your primary care physician and respirologist. Medical decisions are based on complex medical principles and should be left to the medical practitioner who has been trained to diagnose and advise.

**Spirometry** continued from Page 2

### Computerized Tomography (CT) Scan

Although a CT is not routinely recommended when making a diagnosis of COPD, your doctor may order one when it's indicated (infection is not resolving, change of symptoms, consideration for surgery etc.) While a chest X-ray shows larger areas of density in the lungs, a CT scan is more definitive, showing fine details that a chest X-ray does not. Sometimes, prior to a CT scan, a contrast agent may be injected into the vein. This allows your doctor to see the abnormalities in your lungs more clearly.

### Complete Blood Count (CBC)

A CBC will alert your doctor to an infection as well as telling him, among other things, how much hemoglobin is present in your blood. Hemoglobin is the iron-containing pigment in your blood that carries the oxygen from your lungs to the rest of your body.

### Arterial Blood Gases (ABGs)

In COPD, the amount of air that you breathe into and out of your lungs is impaired. Arterial blood ABGs measure the oxygen and carbon dioxide levels in your blood and determine your body's pH and sodium bicarbonate levels. ABGs are important in forming a diagnosis of COPD as well as in determining the need for, and adjusting the flow rate of, oxygen therapy.

### Pulse Oximetry

Pulse oximetry is a non-invasive method of measuring how well your tissues are being supplied with oxygen. A probe or sensor is normally attached to the finger, forehead, earlobe or bridge of the nose. Pulse oximetry can be continuous or intermittent. A measurement of 95 to 100 per cent is considered normal. Along with ABGs, measuring your oxygen saturation level by way of pulse oximetry helps your doctor assess your need for oxygen therapy.

### Alpha-1-Antitrypsin Deficiency Screening (A1AT)

A1AT is a genetic condition that can lead to COPD. It is estimated that about one per cent of all COPD patients actually have A1AT. Thus, testing should be performed for all patients with air-flow obstruction. The initial test performed is serum A1AT level. A low level of A1AT confirms the diagnosis and further assessment with A1AT protein phenotyping and A1AT genotyping should be carried out subsequently. Being diagnosed with COPD at a relatively young age (less than 45 years old) should also alert doctors to the possibility that A1AT deficiency may be the underlying cause. It is believed that this genetic condition remains undiagnosed in many patients.

## Pain and COPD

### A study presented at this year's American Thoracic Society (ATS) meeting reported that patients with COPD are at high risk for persistent pain.

The risk of persistent pain is second only to that of patients with osteoarthritis or rheumatoid arthritis. "Once you adjusted for all other factors to include depression, anxiety, and psychoses, COPD was still very predictive of chronic pain, and in particular, chronic use of opioids, both short acting and long acting," said Melissa Roberts, MS, senior research associate at the Lovelace Clinic Foundation and a doctoral candidate at the University of New Mexico College of Pharmacy in Albuquerque.

It was reported that patients with COPD use a variety of classes of pain medications and a wide variety of antidepressants and anxiolytics. Their use of short-acting opioids is also quite high. According to Roberts, COPD patients used 24 per cent more short-acting opioids compared with other patients as well as more long-acting opioids. Patients with COPD who have chronic pain were more likely to be female, have more comorbid conditions, and have more inflammatory pain than other patients with chronic pain. Interestingly, chronic pain did not correlate with the degree of lung function impairment in the patients with COPD.<sup>1</sup>

Chronic pain is unlike acute pain that accompanies a sudden injury. Chronic pain persists long after an injury has healed. It is pain that is often constant, and one that dramatically interferes with one's daily life. Pain, in and of itself, is not a symptom of COPD; rather, it is often musculoskeletal in nature and commonly associated with the work of breathing. Patients with COPD can often have multiple sources of pain, including neuropathic, muscle, inflammatory, and mechanical or compressive.

Approximately 45 per cent of all COPD patients report chronic pain. Moreover, people with COPD often report their pain as moderate to severe and located primarily in the chest, shoulders, neck and upper arms. And, as if pain is not bad enough, a vicious cycle of symptoms often accompanies pain associated with COPD. These symptoms negatively affect one another and include breathlessness, sleep disturbance and anxiety.

<sup>1</sup>American Thoracic Society (ATS) 2013 International Conference: Abstract A5703. Presented May 22, 2013

## Join today:

The COPD Canada web site is your portal to our association, new and varied educational materials, medical resources and community interaction. **Membership is free of charge** but is restricted to individuals living with COPD or their caregivers. Joining is fast and easy.

Just visit our web site [www.copdcanada.info](http://www.copdcanada.info) and click on membership and follow the step by step instructions. **Once you've joined** you will begin receiving our quarterly "Living with COPD" newsletter and will have complimentary access to all COPD Canada seminars, on-line discussion forums and our member chat section.

**COPD CANADA**, 555 Burnhamthorpe Rd., Suite 306, Toronto, Ont. M9C 2Y3. **For more information contact Henry Roberts, email [henry.copdcanada@gmail.com](mailto:henry.copdcanada@gmail.com), telephone 416-465-6995**



# people

## Mary Layton

An avid athlete, Mary Layton taught skiing, curled, sky-dived, golfed, and enjoyed swimming, going to the theatre, and jogging.

She loved her active lifestyle but she smoked two and a half packs of cigarettes a day for 25 years. Mary is an emphysema patient who was forced to take early retirement in 2001. After living such an active life, she has found it difficult to slow her pace down.

Through speaking to other people with COPD, she recognized the need for an organizing body that could provide information to patients and increase awareness of COPD amongst Canadians. Mary's role within the organization is multifunctional—she is the founder of COPD Canada, an educator and a spokesperson.

Her mission is to get COPD patients to become more proactive in advocating for themselves, to promote the benefits of early diagnosis and treatment, and to get young people to stop smoking.

### Where were you born?

**S**herbrooke, Quebec. We moved to Montreal when I was two.

### Do you still visit Montreal?

As often as I can, I have friends and family there.

### Were you an outdoor enthusiast?

I taught skiing in St. Sauveur, Quebec and Banff, Alberta as I lived and worked in Calgary for six years.

### Competitive skiing—like racing?

No, downhill—pleasure skiing.

### Why did you feel you were qualified to instruct?

I got my skiing teaching certificate at Mount Tremblant, north of Montreal.

### How did you end up in Toronto?

I was a Media Director for an advertising agency in Montreal and was transferred at the request of our largest client.

### What kind of accounts did you handle?

Mostly pharmaceutical accounts although I started my career looking after the Olympic Coin Program for the '76 Olympics. My first television buy was for 6 million dollars—for the Olympic coin program. That was exciting, plus I spent a lot of time at the Olympic Village where I got to meet all the athletes.

### When did you discover you had a problem with your lungs?

I was living with a chiropractor who didn't smoke—who kept telling me that there's something wrong with my breathing. That I was wheezing all the time.

### Were you still smoking at the time?

Yes, I actually had two packs of smokes in

my purse when I was told of my condition by the respirologist.

### What was the diagnosis?

I was told that I have emphysema.

### Did that surprise you?

My first reaction was—no I don't! I was devastated. But, my mother had emphysema. It runs in the family—so I accepted the reality pretty quickly.

### You were pretty active before. What do you miss most?

The winter sports activities.

### Is winter still your favorite season?

It used to be winter but because of my lung condition, I would say that my favorite season now is summer. But I used to enjoy winter. I also curled and loved skating. I was with the Montreal Figure Skating Club for a number of years. Skating was very important in my family. My dad was a professional hockey player. I inherited his "Hockey Legs" and I inherited my mother's emphysema—hey you can't win them all!

**Mary Layton passed away in June of this year having fought a long and courageous battle against the debilitating effects of emphysema. She will be missed. It was her goal to increase awareness of COPD and to build a national patient advocacy association made up of people with the condition. The work that Mary started as a co-founder of COPD Canada continues. COPD People is a regular feature of "Living with COPD". In tribute to Mary, we have repeated her profile from the Summer 2007 edition.**



Oscillating Positive  
Expiratory Pressure Therapy System

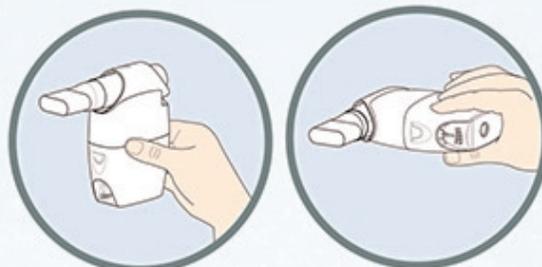
## What is an Oscillating Positive Expiratory Pressure Therapy System?



An Oscillating Positive Expiratory Pressure Therapy System or OPEP device is designed to aid in the loosening and removal of mucus build-up in the lungs. You may need OPEP treatments if you have a lung disease such as cystic fibrosis or COPD where your lungs need help keeping up with the amount of mucus produced each day. OPEP therapy is done by inhaling and exhaling through the device several times, then 'huff coughing' to remove the loosened mucus.

### Oscillating PEP treatments may improve patient compliance and acceptance

- Shorter treatment times than traditional chest physiotherapy
- Easy to learn for independent use
- Inexpensive, quiet and portable device
- Little interruption to daily living
- At least as effective as manual chest physiotherapy



Vertical OR Horizontal

*Hold in the most  
comfortable position*



Watch the Aerobika\* Oscillating PEP video:  
<http://www.youtube.com/watch?v=iy2oYadhF9Q>

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