

# The Human and Economic Burden of COPD:

A Leading Cause of Hospital Admission in Canada



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## Defining COPD –

The Canadian Thoracic Society defines COPD as: “a respiratory disorder largely caused by smoking, characterized by progressive, partially reversible airway obstruction and lung hyperinflation, systemic manifestations, and increasing frequency and severity of exacerbations.”<sup>[14]</sup>

COPD is characterized by persistent inflammation of airways, lung parenchyma and its vasculature. The inflammatory process in COPD is different from that in asthma.

Expiratory flow limitation is the patho-physiological hallmark of COPD. Expiratory flow limitation with dynamic collapse of the small airways compromises the ability of patients to expel air during expiration, resulting in air trapping and lung hyperinflation. Acute-on-chronic hyperinflation has been shown to contribute to shortness of breath during exercise and acute exacerbation in COPD.<sup>[14]</sup>

# The Human and Economic Burden of COPD: A Leading Cause of Hospital Admission in Canada

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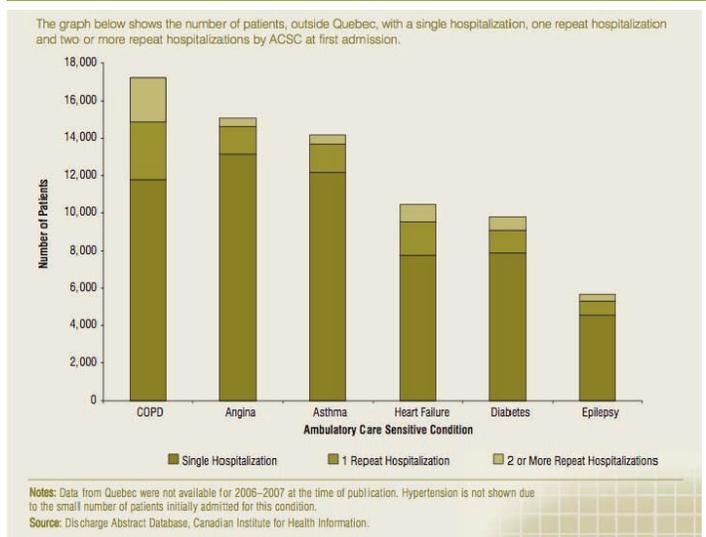
Chronic obstructive pulmonary disease (COPD) is among the most overlooked and misunderstood chronic conditions in Canada.

Too frequently, both in Canada and around the world, patients are diagnosed as having bronchitis, cough or respiratory tract infection, when in fact they may have progressive lung disease – and the acute infection is actually a flare-up of the underlying illness. Failing to recognize and neglecting to treat the underlying condition has contributed to escalating numbers of hospital admissions and early deaths in Canada, and those numbers continue to rise.

COPD is a debilitating and degenerative lung disease. The airways in sufferers narrow, airflow becomes limited and lung function is reduced, leading to disability and premature death. While not curable, COPD is treatable, especially if diagnosed early and preventive treatments are prescribed.

And yet, the most recent statistics on hospital admissions in Canada, collected by the Canadian Institute for Health Information (CIHI), show that COPD now accounts for the highest rate of hospital admission among major chronic illnesses in Canada.<sup>[1]</sup>

## Repeat Hospitalizations by Condition at First Admission



More patients are being admitted to hospitals because of COPD than heart attacks and that figure has been increasing dramatically over the years.<sup>[2]</sup>

Not only is COPD the leading cause of hospital admissions, it also has a much higher readmission rate than other chronic illnesses. In the CIHI report, 18% of COPD patients were readmitted once within the year and 14% twice within the year. These numbers are far greater than for angina, heart failure, diabetes, or hypertension. For example, only 7% of patients admitted to hospital for hypertension were readmitted once and only 2% readmitted twice within the year.<sup>[1]</sup>

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The CIHI data may come as a surprise to many physicians and healthcare administrators in Canada, but they reflect similar statistics now being recorded in the US and Europe.

The spiking hospital admissions rate for COPD also comes as deaths from coronary artery disease, stroke and hypertension have fallen dramatically over the past 40 years.<sup>[3]</sup> COPD is the only chronic disease in which mortality is still increasing.<sup>[4,5]</sup>

This report reviews emerging evidence about COPD and exacerbations, the psychosocial costs to Canadian patients and the burden on the healthcare system. It highlights the fact that exacerbations or COPD lung attacks are the principal cause of hospitalizations in Canada. Over and above that, it shows, COPD lung attacks hasten progression of the disease, lead to rapid deterioration in health and even cause premature death. But, the report also emphasizes, COPD lung attacks can be reduced if the condition is properly treated.<sup>[6,7,8]</sup>

The report demonstrates that the condition must be diagnosed and managed optimally in order to reduce hospitalizations, improve patient quality of life, and provide more complete health care while using health resources most efficiently and effectively.

It concludes with a call to action for the healthcare community to prioritize the diagnosis and treatment of COPD in a similar manner that is currently applied to hypertension and diabetes. An action plan to manage the ongoing care of individuals with COPD is also strongly advised.

### The Burden on Patients and Caregivers

COPD is a low-profile, insidious illness that proceeds almost imperceptibly, gradually depriving individuals of their health and vitality. It frequently affects people in their most productive years, causing shortness of breath, persistent cough, and fatigue. Sufferers feel old before their time, finding normal daily routines such as shopping, housework and even leisure activities an uphill struggle.

Even as their lives become more restricted, they may still be unaware that they have a progressive disease, attributing their symptoms to the normal signs of aging, or being “a bit out of shape”.

### The Burden on Physicians and Canada’s Healthcare System

The new evidence on hospitalizations caused by COPD has direct implications for family physicians and emergency room doctors, as well as specialists. It highlights the need for early and complete diagnosis of patients with COPD to reduce the number of COPD lung attacks requiring hospitalization and improve the effectiveness of health care spending.

Hospital admissions for COPD lung attacks averaged a 10-day length of stay at a cost of \$10,000 per stay.<sup>[9]</sup> A Canadian article published in 2008 conservatively estimated the total cost of COPD hospitalizations at \$1.5 billion a year.<sup>[9]</sup>

According to a Canadian article published in 2008, hospital admissions for COPD lung attacks averaged a 10-day length of stay at a cost of \$10,000 per stay.<sup>[9]</sup> The same Canadian article conservatively estimated the total cost of COPD hospitalizations at \$1.5 billion a year.<sup>[9]</sup> And yet an article published by Mittman et al. states that the simplest way to reduce hospital admissions for COPD is to prevent lung attacks by treating the disease appropriately.<sup>[9]</sup>

A recent international epidemiological study found that the disease is twice as prevalent as previously believed with a full 10% of the population now known to be suffering from it. It is also known that 50% of people who have the condition remain undiagnosed, thus the total could soon rise substantially.<sup>[10, 11]</sup>

Saskatchewan Respiriologist Dr. Darcy Marciniuk, Chair of the Canadian Thoracic Society’s COPD Committee, confirms that hospital admissions for COPD are increasing among patients.

COPD is the number one chronic medical condition reason for hospital admission in his health region, and has been since he started monitoring the data in 2002.

“COPD outstrips all the other comparators—heart failure, ischemic heart disease, diabetes and renal failure—as the cause of hospital admissions,” said Dr. Marciniuk, Professor of Medicine at the University of Saskatchewan, and Head of the Division of Respiriology, Critical Care and Sleep Medicine.

But while he and his respiratory physician colleagues have managed to reduce readmissions and days spent in hospital/ICU by 40% among their diagnosed COPD patients, it is the new and undiagnosed patients who continue to push the COPD admissions rate up.

One way to reduce hospital admissions, respirologists agree, is to discover undiagnosed COPD patients in the first place, so that they may be started earlier on appropriate therapy.

That is where the biggest awareness gap is among family physicians, according to Dr. Jean Bourbeau, Director of the Respiratory Epidemiology and Clinical Research Unit at the Montreal Chest Institute. He confirms that the new evidence, both from his respiratory physician colleagues and the CIHI data, demonstrates that *undiagnosed* and *uncontrolled* COPD is a leading cause of hospitalization in Canada.

He recommends physicians learn to recognize that what might look like an isolated infection—such as acute bronchitis—is likely to be a complication of underlying COPD.

“Dyspnea, sputum change, and a cough are symptoms of an exacerbation of COPD,” says Dr. Bourbeau, who confirms that COPD is the number one cause of admission at his hospital.

Lung attacks are to COPD what heart attacks are to coronary artery disease—when they result in hospitalization they have similar mortality. Observational studies have reported 8% of patients dying in hospital and one-in-four patients dying within one year of being hospitalized. [8, 12, 13]

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In Canada, the one-year mortality rate has been reported to be even higher, points out Dr. Marciniuk, with almost one-in-three elderly patients dying within 12 months of a hospital admission for COPD according to findings from an Ontario database (2000-2004) study. [13]

“The death rate after a COPD lung attack is as least as high as the mortality for a heart attack in Canada,” said Dr. Marciniuk.

The reason for this high mortality incidence is that attacks are not just a symptom of COPD, they actually cause the disease to progress, points out Dr. Bourbeau.

“These attacks cause lasting damage--the patient’s lung function will never be the same again.”

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The way to prevent further damage to the lungs is to treat the underlying illness:

“We have to treat the acute event then initiate long-term COPD treatment to prevent further attacks.”

This strategy then needs to be backed up by an action plan, adds Dr. Bourbeau:

“In addition to prescribing the appropriate medications, we have to teach the patient to recognize his or her own exacerbations and work out an action plan for them.”

Physicians have to learn to do the same for patients presenting with possible lung attacks as they do when they come across a patient presenting with a heart attack, he concludes.

### **Underlying Diagnosis Missed at Hospital Admission: A Real Concern**

Dr. Ron Grossman, respiratory physician at Credit Valley Hospital in Mississauga, Ontario, and Professor of Medicine at the University of Toronto, agrees that COPD is frequently not diagnosed even when patients are hospitalized for an exacerbation.

“An exacerbation is in fact what Respirologists call a ‘lung attack’, which has the same consequences as a heart attack in terms of the patient’s quality of life, future hospital admissions and mortality.”

“There is no doubt that patients come into hospital with diagnoses other than COPD, such as pneumonia or congestive heart failure, and yet COPD is underlying them and contributing to the severity of the illness.”

These patients rarely get to see a respirologist, so they continue to be undiagnosed and prone to preventable lung attacks of COPD. They remain undertreated for the underlying condition of COPD, and are at risk for experiencing further damage to their lungs through subsequent lung attacks. In fact, most patients with COPD are not diagnosed until the disease is well advanced. [14]

Dr. Grossman recommends physicians be proactive in screening patients for COPD. He states that this is the way to reverse the escalating rate of hospital admissions for a disease he describes as being “under the radar.”

Spirometry is a simple—and in fact is the only—way to diagnose COPD, points out Dr. Grossman.

“You need an objective measure of lung function - spirometry is the only way to get that measure and determine whether a patient has COPD.”

“If spirometry is done early, at-risk patients can be identified and be advised to take preventive measures that will help to alter the natural course of the disease.”

The Canadian Thoracic Society’s 2008 Guidelines recommend spirometry for anyone over 40 who smokes or used to smoke and has just one symptom, such as breathlessness, wheezing, cough or persistent phlegm.<sup>[14]</sup>

As Dr. Grossman puts it: “You wouldn’t dare to look after a patient with hypertension without measuring their blood pressure. And you wouldn’t dare look after a diabetic patient without measuring their blood sugar. So why do we allow physicians to look after patients with COPD without measuring lung function? It doesn’t make sense.”

Some family physicians do spirometry in their offices, although most don’t, and many specialists, including cardiologists, neglect to test for the condition even though it has been shown that more than 50% of cardiac patients also have COPD. Receiving the right treatment for COPD will improve a patient’s outcome over and above being treated for the cardiac illness, says Dr. Grossman.

**The right medications, coupled with a patient-education plan to enable patients to use inhalers properly and how to anticipate and deal promptly with exacerbations (or COPD lung attacks), have been shown to improve life for patients and reduce hospitalizations.**

## **COPD Exacerbations or ‘Lung Attacks’ can be Prevented.**

Progressive airway obstruction and decline in lung function have a profound effect on patients’ quality of life, limiting their ability to work, engage in social activities, and look after themselves and their families. COPD gradually leads to disability, depression and shorter life expectancy.

But COPD is treatable at any stage of the illness, according to the Canadian Thoracic Society.<sup>[14]</sup>

The right medications, coupled with a patient-education plan to enable patients to use inhalers properly and how to anticipate and deal promptly with exacerbations (or COPD lung attacks), have been shown to improve the quality of life for patients and reduce hospitalizations.

**“COPD is treatable at any stage of the illness.”**

Dr. Grossman: “The evidence is overwhelming that patients with COPD of a moderate to severe degree, when treated, improve—their exercise tolerance improves, their quality of life improves, their lung function gets better. They have fewer exacerbations and fewer hospitalizations.”

Dr. Bourbeau stresses the written action plan that helps the patient learn to recognize a lung attack and to treat it promptly with a self-administered prescription of antibiotic and prednisone, with follow-up by a health professional to ensure that the patient is responding.

Unfortunately, according to a recently published survey of 389 patients living with COPD, only one-in-three patients had a written action plan.<sup>[15]</sup>

## **Comprehensive Care is the Gold Standard**

Full care of the patient includes drug therapy for both the acute event and the underlying illness, as well as education and follow-up, adds Dr. Bourbeau:

“The patient needs proper pharmacologic treatment for the acute episodes AND the underlying chronic disease.”

“They also need non-pharmacologic treatment including pulmonary rehabilitation, as well as education in self-management and the right way to take their medications. A health professional needs to be in charge of educating patients, ensuring that they have had the right vaccines and help with smoking cessation.”

These are the core elements of a comprehensive care team approach that works to reduce lung attacks, confirms Dr. Marciniuk.

“Comprehensive care is a team approach; you build in support around the patient, their family, and their family physician and appropriately resource it, so you have the right person doing the right job at the right time.”

There is, he says, growing evidence that a comprehensive chronic disease management model targeted to optimize care, reduces hospital admissions and saves lives.

“The evidence from Ontario is that when patients are followed by a COPD specialist together with a family physician, the outcomes are better than just the family physician by themselves,” Dr. Marciniuk stresses.<sup>[13]</sup>

“It helps to connect the dots, preventing the current disconnect and gaps we now see between acute and chronic care.”

## Recommendations for Change

The purpose of this report is to focus attention on an alarming and escalating trend in higher hospital admission rates for COPD and improve the management of patients with COPD, who may currently be under-diagnosed and undertreated.

Physicians, hospital administrators and health regions throughout Canada all have an important role to play in reducing hospital admissions and optimizing the management of COPD patients.

Physicians need to be aware of the high incidence and prevalence of the disease, and to test for it. They can then follow up with regular assessment of patients and forge links with comprehensive care provision.

Hospital administrators can monitor the causes of hospital admissions and flag these to the health region.

Health regions can invest more resources in chronic care teams and appoint case managers where possible.

## Conclusion

COPD, while serious and life-threatening, is treatable at any stage of the illness. COPD exacerbations or lung attacks can be prevented if patients are diagnosed and prescribed the right medications. These treatments have been demonstrated to diminish COPD lung attacks, improve lung function, improve quality of life and prevent hospitalizations. Smoking cessation and regular vaccination for influenza and pneumococcal disease are also advised.

A full pulmonary rehabilitation program increases patients' energy levels and ability to complete day-to-day activities.

Comprehensive care of COPD patients, including all medical interventions listed in the Canadian Thoracic Society guidelines and patient education in self-management, has been demonstrated to be the best approach and should be the gold standard of care. Patients should expect no less.

## Testing for COPD

Spirometry (breathing test) is the only sure way to diagnose COPD. A forced expiratory volume (FEV<sub>1</sub>) to forced vital capacity ratio (FVC) of less than 0.7 indicates the patient has COPD.

Once diagnosed, patients' symptoms must be assessed regularly; spirometry is an important tool to help measure disease progression.

## CALL TO ACTION

### Patients:

- Be aware that COPD is preventable and treatable;
- If you smoke, you should stop;
- If you have ever smoked and have persistent respiratory symptoms (cough, shortness of breath, phlegm) or frequent lung infections, see your doctor and ask for spirometry (breathing test).

### Physicians:

- Be aware that COPD incidence and prevalence is increasing;
- Be aware that COPD is preventable and treatable;
- The most important action is to help your patients to stop smoking;
- Suspect and test for COPD with spirometry in any patient over 40 who smokes or used to smoke, and has persistent respiratory symptom(s) or chest infections;
- Understand that COPD exacerbations (lung attacks) are a major indicator of worsening COPD; [6]
- Prevent disease exacerbations with optimal pharmacologic and non-pharmacologic management; [14]
- Pulmonary rehabilitation and patient education are important non-pharmacologic interventions;
- Where possible, link your patient with a comprehensive care, chronic disease management team.

### Hospitals:

- A comprehensive and coordinated care map must become the standard of care for all patients with COPD.

### Health regions:

- Comprehensive and coordinated disease-state management programs, which include Pulmonary Rehabilitation, must become the standard of care for all patients with COPD.



### For More information

<http://www.lung.ca>  
[www.respiratoryguidelines.ca](http://www.respiratoryguidelines.ca)

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