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Accelerated lung aging may play a role in COPD

Lung aging refers to the natural physiological changes that occur in the lungs as a person grows older.

The aging process affects all organs and tissues in the body, including the lungs, and can result in various structural, functional, and cellular changes in the respiratory system.

One of the most noticeable changes in lung aging is a reduction in lung capacity, which refers to the maximum amount of air the lungs can hold. With age, the lung tissues lose elasticity and become stiffer, which can lead to a decrease in lung compliance, or the ability of the lungs to expand and contract efficiently. This can result in a reduced ability to take in deep breaths and fully exhale, leading to a decrease in lung function.

Cellular aging, or senescence, results in a series of alterations in cell morphology and function, including the loss of the ability to proliferate. A number of molecular and cellular mechanisms are associated with cellular aging, including accumulation of DNA damage, impairment of DNA repair, altering the activity of genes without changing their structure, increased production of free radicals and protein damage, and telomere attrition. Cellular aging and cell arrest not only occur after exhaustion of a predetermined proliferative capacity, but also can be induced by external stresses, such as oxidative stress.

An enhanced or abnormal inflammatory response to the lungs to inhaled particles and gases, usually from cigarette smoke, is considered to be a general pathogenic mechanism in chronic obstructive pulmonary disease. The

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Chronic Obstructive Pulmonary Disease
www.copdcanada.info

What is ChatGPT and why should we care?

It is very likely that ChatGPT, a new artificial intelligence (AI) platform, will be used in the dissemination of medical information for patients. Many in tech world believe it will overtake “Dr Google” as the go-to search application. We decided to take a ride on the ChatGPT train to see where it will take us. But first an overview.

According to OpenAI, ChatGPT is “an artificial intelligence trained to assist with a variety of tasks.” More specifically, though, it is a language model OpenAI designed to produce human-like text and is designed to converse with people, hence the “Chat” in ChatGPT. The “GPT” in ChatGPT comes from the learning model that the ChatGPT application utilizes. GPT stands for Generative Pre-trained Transformer and what has been recently introduced to the world is the fourth iteration of this language model. Practically, this means

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Ask Dr. Bourbeau

Jean Bourbeau is a respirologist and full professor in the Department of Medicine and Epidemiology and Biostatistics, McGill University, Montreal



Q I'm a 70-year-old retired person, diagnosed about two years ago with COPD. I have six stents in my heart and had two heart attacks in two years. Lately the phlegm is so bad in the morning it feels like it's filled up my windpipe to the point where it's hard to take a breath when I first wake up. Do you have any advice to help me manage my phlegm issue?

A You have not told me if you were still a smoker? I will presume you are not but if you are, this will be the

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Ask Dr. Bourbeau

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first thing to act on, stop smoking. COPD can be associated with chronic bronchitis and this can explain the production of secretions that is more than in the normal individual. Airway clearance is more problematic and it is not as effective during the night compared to daytime while we are wide awake. Airway clearance devices can help loosen and clear mucus in the lungs. Those devices called OPEP (Aerobika, flutter) can be used at bedtime and when you wake up, just before getting out of bed. However, before doing anything, you need to speak with your respirologist. Your respirologist will make sure you have a chest X-ray done, will exclude other chronic lung conditions or congestive heart failure, and will review, if needed, your current medication.

Q I have just been diagnosed with MAC. They discovered this bacterium in my sputum cultures following months of pneumonia and recovering from a pseudomonas infection. Should I be worried about MAC or is it treatable?

A MAC (Mycobacterium avium complex) can be due to contamination, a contaminant of the airway, or a bacterium that causes a lung infection. Only the last one needs to be treated and this usually will be taken care of by an infectious disease specialist or respirologist. Often in COPD, MAC is an airway contaminant and not causing lung infection. The diagnosis can be difficult to make and the treatment is very intensive (many antibiotics, perhaps four, and for 18 months). This is why it needs to be carefully investigated and seen by a

specialized physician. Talk to your doctor or respirologist; they will know what it is needed for you or refer you as needed.

Q I recently started O₂ at night. Shortly after I started, I developed severe earaches in both ears, loud tinnitus, and dizziness. I went to the doctor thinking it was a sinus infection, but he said my sinuses were good and sent me to a physical therapist for vertigo treatment. That helped but I recently had another episode while using oxygen. Is this common? I need the oxygen at night so it's a bit of a dilemma.

A There is no direct relationship between earaches, vertigo, and using oxygen at night. However, ear infections can cause inflammation and affect the balance system of the inner ear, leading to vertigo. COPD patients who use oxygen therapy at night may develop ear infections due to the increased humidity in the nasal passages. This can cause discomfort and ear pain. Continue to check in with your healthcare professional so they can help you address the situation.

Q I am 58, female, never had any health issues in my life, non-smoker, no alcohol, was physically active. I was recently diagnosed with Alpha 1. My level of anxiety is huge, not knowing what I will face moving forward. Doing any kind of physical activity is currently challenging due to chest discomfort. Please share any tips or advice on how I can achieve best lung health and

hopefully a long life while dealing with this condition.

A The first and most important thing to do is to have lung function tests to find out if you have any lung disease such as COPD/emphysema. Remember that the A1ATD makes you at risk but it doesn't mean that you have the disease. The Living Well with COPD series (see website www.livingwellwithcopd.com) has an education module specifically written for A1ATD that might be interesting for you. Make sure you are seen/guided by a physician, that a diagnosis is made with respect to COPD/emphysema, and appropriate treatment is implemented as needed.

Dr. Jean Bourbeau is director of the Center for Innovative Medicine (CIM) of the Research Institute of the McGill University Health Centre (MUHC) and director of the Pulmonary Rehabilitation Unit. He is the past president of the Canadian Thoracic Society (CTS) and is a member of the scientific committee of GOLD.

We invite your questions. Please mail questions to: Ask Dr. Bourbeau 1460 The Queensway, Suite 212, Etobicoke, Ont. M8Z 1S4—or you can e-mail questions to: AskCOPDCanada@gmail.com. General inquiries: COPD Canada Tel: 416-465-6995 E-mail: exec.copdcanada@gmail.com

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Pulse: News about COPD

Study shows that most older patients with COPD are in good mental health

■ **Toronto**/A majority of adults older than 50 years with COPD had no psychiatric disorders and had good mental health, according to a study published in *International Journal of Environmental Research and Public Health*. “Most of the previous research on COPD, including my own, has focused on those who are not doing well with respect to depression and anxiety,” said Esme Fuller-Thomson, PhD, director of the Institute for Life Course and Aging at the University of Toronto and professor in the Factor-Inwentash Faculty of Social Work. “The nationally representative findings of our current study are good news that should be shared with patients and their families. Knowing that most people with COPD are happy and mentally healthy may be very reassuring for the newly diagnosed,” said Fuller-Thomson.

 <https://tinyurl.com/2pnhmbex>

2023 GOLD reports COPD outcomes are improving


■ **Philadelphia**/The 2023 Global Initiative for Chronic Obstructive Lung Disease report defines several changes regarding definitions, assessment tools and treatments for COPD, all of which underscore recent advances in the field. “COPD is not a stagnant disease,” said Gerard J. Criner, MD, FACP, FACC, director of the Global Initiative for Chronic Obstructive Lung Disease (GOLD). “The report identifies disease-modification therapies because we’re improving outcomes and we’re changing mortality, which should give patients and clinicians hope that the field is improving on a trajectory for the better.” One overarching significant change in the report is a revised definition of COPD that is more all-encompassing of the demographic that can develop COPD, according to Dr. Criner. “The modification of the definition acknowledged that it’s not just people who have been exposed to cigarette smoke but other types of exposures, such as biomass fuels,” Dr. Criner said. “The definition also includes people who work in jobs that expose them to a variety of conditions or poor climate. “The hope is to determine factors that may contribute to COPD earlier in life, so we can intercede and maybe transform the development or alter the trajectory,” he added.

 <https://tinyurl.com/y5zi4dy5>

Pulse: News about COPD


Chest sensors allow remote six-minute walk testing for lung patients

■ **Rochester, N.Y./**Chest sensors that measured heart rate and accelerometry enabled patients with pulmonary artery hypertension to undergo six-minute walk tests remotely with data similar to that collected in clinic, according to study results published in *CHEST*. Measuring cardiac effort rather than distance walked can overcome prior limitations of exercise tolerance home assessment, according to researchers. “We think this home six-minute walk test could complement telemedicine or help when assessing clinical status or titrating a drug,” said Daniel J. Lachant, DO, assistant professor of medicine at the University of Rochester Medical Center. “We were happy to find out that after adjusting for heart rate there was a similar measurement obtained in the clinic and home setting. In terms of future studies, this data opens the idea of doing decentralized clinical trials with physiologic assessment remotely,” Lachant added.

 <https://tinyurl.com/yk67x6yv>

Europe strives for tobacco-free environment

■ **Geneva, Switzerland/**The European Respiratory Society (ERS) is supporting an ambitious goal of the European Citizens’ Initiative to achieve a tobacco-free environment and the first European tobacco-free generation by 2030. ERS calls on its network to join the new campaign, launched recently by the European Citizens’ Initiative, which urges European Union citizens to get behind calls for a tobacco-free environment and generation. The campaign has until January 2024 to gather one million signatures across the European Union. Once it reaches one million validated signatures, the European Commission is obliged to respond and take action. Any EU citizen who is old enough to vote in European Parliament elections can sign. The campaign aims to achieve several key objectives, including ending the sale of tobacco and nicotine products to citizens born since 2010. The WHO estimates that the proportion of deaths from non-communicable diseases attributable to tobacco use in Europe was 18% in 2015, meaning that almost one in every five deaths from non-communicable diseases could be avoided if tobacco use was eliminated altogether from the region.

 <https://tinyurl.com/fyv6wajr>

Link between signs of lung aging and smoking

Lung aging continued from page 1

persistence of chronic inflammation in the lungs in COPD may involve the aging of cells and their inability to divide. There are features of accelerated aging in COPD patients, particularly in emphysema. In addition, COPD is associated with systemic features such as increased risk of osteoporosis and cardiovascular disease, which also may be linked to accelerated aging. This suggests a close relationship between the pathogenesis of COPD and aging processes.

Those older than 65 years have a higher disease rate than younger groups, independent of their history of exposure to tobacco smoke. The aging lung shows progressive distal air space enlargement, with loss of gas-exchanging surface area and the support of the alveolar attachments for peripheral airways. Although these structural changes are thought to be non-destructive, in contrast with smoking-induced emphysema they do have functional consequences resulting in a loss of elastic recoil of the lungs, an increase in residual volume and functional residual capacity or over-inflation of the lungs. In addition, there is associated elastin fibre fragmentation. This loss of elastin fibres is similar to that which occurs with aging in the skin, resulting in loss of elasticity and skin wrinkling which is enhanced by smoking. Interestingly, the degree of skin wrinkling correlates with quantitative measurements of emphysema by CT (computed tomography) scanning. Thus, cigarette smoking produces a loss of elasticity both in the lungs and systemically in the skin, suggesting that cigarette smoke may accelerate the aging process.

Cigarette smoking also results in cellular aging. Cigarette smoking is an important risk factor in many age-related diseases and is associated with increased systemic inflammation and oxidative stress. This is thought to contribute to the other manifestations of COPD, such as muscle wasting, cardiovascular disease and osteoporosis, which are also characteristics of aging.

There has been a recent focus of interest on the mechanisms

of aging and cellular aging and their role in the development of chronic diseases. The links between signs of aging in smokers and patients with COPD, particularly those with emphysema, are striking. A number of animal models and exposure of human cells in vitro provide evidence that cigarette smoking results in cellular aging. Markers of cell senescence and accelerated aging can be found in both lung cells and circulating leucocytes in patients with COPD. Anti-aging molecules have also been shown to be decreased in the lungs of COPD patients. Suffice it to say, there is considerable evidence that quitting smoking is not only good for your health, but also for your looks.

For more information: <https://tinyurl.com/2vjhf6>

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.

PRINTED BOOKLETS NOW AVAILABLE ON AMAZON!

Get a printed booklet delivered right to your doorstep by ordering your copy today (search for Living Well with COPD).

Learn skills to adopt healthy new lifestyle behaviours. This successful program has been scientifically proven to help improve the lives of people suffering from COPD.

Visit our website and download our **FREE** patient **ACTION PLAN**

www.livingwellwithcopd.com



Is OpenAI useful when learning about COPD?

ChatGPT continued from page 1

that to use ChatGPT, you ask ChatGPT a question by entering it into a text box. The artificial intelligence program then processes your question and responds to it in a conversational format based on the information that it has available. The developers of this technology are OpenAI.

“The AI lab's mission is to ensure that artificial intelligence benefits humanity in a safe and ethical way”

OpenAI is an artificial intelligence research laboratory consisting of a team of researchers, engineers, and domain experts working towards advancing artificial intelligence in a safe and beneficial way. It was founded in 2015 by a group of prominent figures in the technology industry, including Elon Musk, Sam Altman, Greg Brockman, Ilya Sutskever, John Schulman, and Wojciech Zaremba, among others.

The AI lab's mission is to ensure that artificial intelligence benefits humanity in a safe and ethical way. To achieve this, OpenAI conducts research in a wide range of areas of artificial intelligence, including deep learning, natural language processing, robotics, and reinforcement learning. The organization also works on developing new tools and technologies to advance the field of AI, as well as engaging in outreach and education initiatives to promote public understanding of the technology. OpenAI is a non-profit organization and is committed to making its research findings and software tools widely available to the public, with the goal of advancing the field of artificial intelligence and maximizing its benefits to society.

COPD Canada ran ChatGPT through its paces asking simple questions related to Chronic Obstructive Pulmonary Disease. The COPD Canada questions and ChatGPT answers follow:

COPD Canada: Some COPD patients believe that salt air, particularly near the

seashore, helps with their breathing. Is salt therapy a valid thing?

ChatGPT: Salt therapy, also known as halotherapy, is a complementary therapy that involves breathing in salt-enriched air in a controlled environment, such as a salt cave or a salt room. The idea behind this therapy is that the salt can help to clear

mucus from the airways and reduce inflammation.

While some individuals with COPD may find that salt therapy helps to alleviate their symptoms, there is currently limited scientific evidence to support the effectiveness of this therapy for COPD.

A few small studies have suggested that halotherapy may improve lung function in people with COPD, but more research is needed to confirm these findings and to determine the optimal dose and duration of therapy.

It's important to note that salt therapy should not be used as a substitute for conventional medical treatment for COPD and should always be discussed with your healthcare provider before starting any kind of complementary therapy.

COPD Canada: Where is the science regarding stem cell treatments related to lung disease?

ChatGPT: Stem cell therapy is a promising area of research for lung diseases such as COPD, idiopathic pulmonary fibrosis (IPF), and lung cancer. Studies in animal models have shown that stem cells can differentiate into lung cells and potentially repair damaged lung tissue. However, the majority of these studies have been pre-clinical and more research is needed to understand the safety and efficacy of stem cell therapy in humans.

A few small clinical trials have been

conducted on patients with IPF and COPD, and they have shown some promising results with respect to lung function improvement and quality of life, however, the evidence is still limited, and more research is required to confirm the safety and efficacy of these treatments.

It's important to note that stem cell therapy for lung diseases is currently considered experimental and is not widely available or approved for use. Patients should consult with their physicians before considering any stem cell therapy and be aware of the risks and uncertainties associated with this type of treatment.

COPD Canada: How do you test for chronic obstructive pulmonary disease?

ChatGPT: There are several tests that can be used to diagnose chronic obstructive pulmonary disease (COPD), including:

- **Spirometry:** This test measures how much air a person can inhale and exhale and how quickly they can exhale.
- **Lung Function Tests:** These tests measure how well the lungs are working and can include tests such as diffusion capacity and arterial blood gases.
- **Chest X-ray:** This test can show if there is any damage to the lungs or if there are any other conditions that may be causing symptoms similar to COPD.
- **CT scan:** A CT scan can provide more detailed images of the lungs and can help to identify specific areas of damage or other conditions.
- **Blood tests:** Blood tests can be used to check for certain biomarkers that may indicate the presence of COPD.
- **Pulse oximetry:** A simple test that measure the level of oxygen in your blood.

A combination of tests may be used to confirm the diagnosis of COPD. Your doctor will also take into account your symptoms and medical history to determine the best course of action.

ChatGPT is clearly an application that will emerge as a major contender in healthcare “search” technology. It's so promising that Microsoft has invested \$10 Billion US into ChatGPT, changing how it will compete with Google, Apple, and other tech giants. ChatGPT has recently been integrated into Microsoft's search engine BING.—HR



COPD people

Barbara Moore

Barbara Moore was born in Hamilton, Ont. where she and her husband still live. The youngest of five, she grew up with three sisters and a brother. Barbara has three children of her own, two boys and one girl. She's delighted to be a grandmother with three grandchildren who bring her a lot of joy. Professionally, she taught accounting and finance at a community college. She also operated a small bookkeeping business for many years. Barbara is retired now, for the most part. A few of her client/friends will not let her go, so she still completes a few tax returns each year. A couple of years ago she was asked to join the Committee to Evaluate Drugs for the Ontario Ministry of Health, and she continues with that work. In 2016, she started the online patient advocacy and support group called CatchYourBreath60. Her goal was to create a community of patients who are experiencing the burdens of COPD; an online place where people could go to learn about their condition and to share tips and knowledge. The group has recently moved from Facebook to YouTube. To learn more about the group: <https://tinyurl.com/3tnue9eh>

Barbara was diagnosed with chronic obstructive pulmonary disease in 2015 but has had symptoms since 2002.

Were you a smoker?

I smoked for over 20 years.

Do you recall why you started smoking?

We all had to be as slim as possible in those days. Smoking helped you lose weight and keep it off. I was a bit overweight, so it was almost impossible to quit. I didn't want to gain the 10 pounds back.

Did your husband smoke?

He quit in 2015 because he had a heart attack.

When did you realize that something may be wrong with your health?

I knew that something was going on with my breathing, but I ignored it because I didn't want to quit smoking. My daughter, who is a social worker, told me that I may have COPD. It was the first time I realized what I was going through may be a bigger problem than I let on.

Was your diagnosis confirmed by spirometry?

At first, my family doctor did not want me to have a spirometry test. I told him that to get to this appointment I had to take three rests to catch my breath. I was so short of breath. That convinced him to send me for a spirometry test. When the results came, I was told that I had Stage 3 COPD.

Do you have a respirologist?

I'm with the Firestone Clinic in Hamilton.

Have they specified if you have emphysema or chronic bronchitis?

I've been diagnosed with COPD/Asthma overlap. The COPD is emphysema. I've been treated all my life for bronchitis.

Do you have panic attacks or flares very often?

I experienced horrible panic attacks that sent

me to emergency more times than I could count. During the pandemic I was introduced to a respiratory therapist who noticed that I wasn't breathing properly. He taught me deep breathing exercises that help me manage my panic attacks.

Do you use a rescue inhaler?

I don't like to use the rescue inhaler because I have had heart issues, arrhythmia. The rescue inhaler makes my heart go really fast, which is a concern.

Have you attended pulmonary rehab?

I was an inpatient for a month and graduated to the day program for three months.

Do you have any advice for people dealing with COPD?

My mantra is: Exercise, have a clean diet, and practice mindfulness.

Can you explain what you mean by mindfulness?

By mindfulness I mean paying attention to what you are doing right now. Stop thinking about what's coming, what's gone. Be in this moment. In this moment you can control everything that is happening. You can focus on yourself. If you feel a panic attack coming on, you can focus on your breathing. Get it under control. It's easier to do if you are in the moment.

Do you have any hobbies?

I'm a gardener. In the winter my house is full of succulents. I love being outside getting my hands dirty, dealing with plants.

Do you have a favorite smell?

Lavender. I love the smell of lavender. Scents have a big effect on me.

Meet Darlene



Darlene has had a hard couple of years - her husband died, she lost her housing, and then her dog died.

Then, Darlene's lung condition worsened and suddenly she couldn't breathe.

When she was introduced to ProResp, Darlene was living in an unheated trailer behind her sister's house

Darlene's RT, Sarah, used her contacts to find Darlene a new place to live, in an affordable housing building for seniors.

Today, Darlene has a new Dog, Bentley, and is doing much better.

"Sarah is a blessing. I am so lucky to have her," Darlene told us.

Helping people breathe right, at home.

