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pharmacy PRACTICE + BUSINESS

eCortex.ca

A primer on managing Asthma and COPD

by Trevor Shewfelt, B.Sc.,B.Sc. Pharm,CRE

Learning objectives

After completing this lesson, the pharmacy technician participant will be able to:

1 Describe differences in presentation between asthma and COPD
2 Describe approaches to managing asthma and COPD
3 Identify the technician's role and opportunities for technicians to enhance the care of people with asthma and COPD
4 Compare inhalation devices to treat asthma and COPD and match devices to people's needs

Introduction

"When you can't breathe, nothing else matters." This American Lung Association tag line encapsulates the importance of respiratory health. Most people presenting with breathing problems in pharmacies will have asthma or chronic obstructive pulmonary disease (COPD). These conditions, their treatment, and how technicians can help are the focus of this CE lesson.

Asthma

Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by a history of respiratory symptoms

TABLE 1 - The Differences between Asthma and COPD[3,4]

	Asthma	COPD
Age of onset	Usually < 40 years old	Usually > 40 years old
Smoking history	Not causal (a person with asthma may smoke and smoking may make the asthma worse, but smoking doesn't cause asthma)	Usually > 10 pack-years (for example, if someone smoked 1 pack a day for 10 years, that would be 10 pack years, if someone smoked 2 packs per day for 5 years that would also be 10 pack years)
Sputum production (coughing up mucus, phlegm)	Infrequent	Infrequent
Disease course	Stable (with exacerbations)	Progressive worsening (with exacerbations)
Spirometry (breathing tests to assess lung function)	Results often normalize with treatment	Results may improve with treatment, but never normalize
Clinical symptoms (for example, cough, shortness of breath)	Intermittent and variable	Persistent
Airways affected	Large and small	Small
Airway constriction reversible with bronchodilator?	Yes	No
Cause of airway obstruction	Smooth muscle spasm	Smooth muscle contraction
Immune system involvement	Eosinophilic and Th2 inflammation	Neutrophilic and CD8 lymphocytes inflammation

CD8–cluster of differentiation 8; COPD–chronic obstructive pulmonary disease; Th2–T-helper cell type-2

such as wheeze, shortness of breath, chest tightness, and cough that vary over time and in intensity, together with variable expiratory airflow limitation.[1] Simply, people diagnosed with/having asthma will say sometimes they have trouble breathing and sometimes not. People diagnosed with/having asthma will have attacks (worsening of symptoms) when they encounter triggers. Some attacks will be mild, like a cough. Some will be severe and life-threatening, with signs such as being unable to recite a seven-digit phone number. Asthma triggers can originate outside the body (for example, cat dander, dust mites) or within the body (for example, emotional turmoil, changing hormones).[1]

COPD

COPD is a common, preventable, and treatable disease, characterized by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities in the lungs. It is usually caused by exposure to noxious particles or gases and influenced by personal factors including abnormal lung development. COPD is caused mostly by smoking. COPD can be prevented by avoiding smoking. Lung changes in COPD are irreversible and worsen over time. COPD is not curable; however, symptoms and exacerbations can be controlled with treatment.[2]

Epidemiology

Asthma is a common disease, affecting 3.8 million Canadians.[5] Asthma prevalence increases in childhood, peaking at age 10–14 for males (22.2%) and age 15–19 in females (17.0%). Asthma prevalence declines after age 30–34 and remains steady until age 60–64. After age 64, prevalence increases in both males and females.[5]

COPD affects 2 million Canadians over the age of 35. It is a major cause of death and disability worldwide. The World Health Organization estimates COPD to be the world's third leading cause of death.[5]

The prevalence of COPD among Canadians ≥35 years old increases steadily across the life span. The prevalence of COPD is similar among males and females, but beyond the of age of 60–64, it is consistently higher among males than females.[5]

Morbidity and mortality

Asthma morbidity and mortality are surprisingly high. Mild asthma (for example, ≤1 exacerbations per week), according to the Global Initiative for Asthma (GINA), represents 50%–75% of people diagnosed with/having asthma.[1] Even patients with mild asthma are at risk of serious adverse events. Of adults needing emergency care for asthma exacerbations, 30%–37% had mild asthma. In addition, 16% of near-fatal asthma and 15%–20% of deaths of people with asthma had symptoms occurring less than weekly in the previous three months.[6]

COPD all-cause mortality in those ≥35 years old is consistently two to three times higher than those without COPD. Canadian statistics from 2011–2012 showed the 35–39 age group with COPD had a 3.1 chance in 1,000 of dying versus a 0.7 chance in 1,000 for people without COPD. A person ≥85 years old with COPD had a 156.3 chance in 1,000 of dying versus an 89.5 chance in 1,000 for a person without COPD.[5]

COPD is associated with co-morbidities such as cardiovascular disease, depression, lung cancer, anxiety, metabolic syndrome, osteoporosis, nutritional disturbances leading to weight loss, skeletal muscle dysfunction, and exercise intolerance. Mortality rates of people with COPD increase with pneumonia, influenza, and complications of other chronic conditions such as diabetes and cardiac conditions.[7]

Diagnosis

Diagnosis of asthma and COPD is often based solely on symptoms. However, both GINA guidelines for asthma and Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines for COPD recommend spirometry to confirm diagnosis.[1,2] Spirometry can be done in a physician's

office, if equipped, but is often done by respiratory therapists. Spirometry involves measurements such as forced expiratory volume in one second (FEV1), forced vital capacity (FVC), and change in lung function after bronchodilator use. Some people have symptoms of both asthma and COPD. This group is said to have asthma-COPD overlap syndrome (ACOS).[4]

Technicians can ask respiratory patients if they have had specialized breathing tests. If they haven't, alert the pharmacist to bring it to the physician's attention so this testing can be completed.

Approach to treatment – Asthma

Aim for the person's asthma to be well controlled (see Table 2).[8] Well-controlled asthma criteria changed in the 2021 recommendations. For example, control was <4 daytime symptoms per week or <4 doses of reliever per week. It is down to <3 of each. The asthmatic's environmental triggers should be reduced or eliminated (for example, by using pillow and mattress covers to reduce dust mite exposure).

Asthma pharmacotherapy has evolved as well. A big change involves reliever medications. For safety, GINA guidelines no longer recommend short-acting beta-agonists (SABAs, for example, salbutamol) alone as relievers for mild asthma in adults and adolescents.[1] SABA treatment alone increases the severe exacerbation risk. All asthmatic adolescents and adults should receive inhaled corticosteroids (ICS) daily or, in mild asthma, an as needed (PRN) low-dose ICS-formoterol combination inhaler. (As they become available, future GINA guidelines will recommend other combination inhalers as relievers.) Even in very mild asthma, (symptoms ≤2 per month,) GINA guidelines recommend a PRN ICS-formoterol as a reliever. The reason again is safety. High SABA use almost doubles the risk of exacerbation versus low SABA use, whether the patient has mild, moderate, or severe asthma.[9] SABINA (the SABa use In Asthma program) defines low SABA use as 0–2 canisters per year. How many asthma

TABLE 2 - Criteria for Well-Controlled Asthma[8]

Characteristic	Frequency or Value
Daytime symptoms	≤2 days/week
Nighttime symptoms	<1 night/week and mild
Physical activity	Normal
Exacerbations	Mild and infrequent
Miss work, school, or activities due to asthma	None
Need for a reliever (SABA or bud/form)	≤2 doses/week
FEV1 or PEF	≥90% of personal best
PEF variation from day to night	<10%–15%
Sputum eosinophils	<2%–3%

TABLE 3 - Summary of Asthma Treatment–Adults & Adolescents 12+ years[1]

	Step 1 (Very Mild)	Step 2 (Mild)	Step 3 (Moderate)	Step 4 (Severe)	Step 5 (Very Severe)
Preferred Controller	PRN low-dose ICS-formoterol combo	Daily low dose ICS or PRN low dose ICS-formoterol combo	Low dose ICS-LABA	Medium dose ICS-LABA	High-dose ICS-LABA. Specialist assessment and possible add-on therapy e.g., tiotropium, anti-IgE, anti-IL5/5R, anti-IL4R
Other Controller Options	Low dose ICS taken whenever SABA is taken	Daily LTRA or low dose ICS taken whenever SABA is taken	Medium dose ICS or low dose ICS+LTRA	High dose ICS, add-on tiotropium or add-on LTRA	Add low dose OCS, but consider side effects
Preferred Reliever	PRN low dose ICS-formoterol combo		PRN low dose ICS-formoterol combo for patients prescribed maintenance and reliever therapy		
Other Reliever Options	PRN short acting SABA				

TABLE 4 - Summary of Pharmacological Treatment of Stable COPD[2]

	Group A	Group B	Group C	Group D	Note:
Signs and Symptoms	0-1 moderate exacerbations/year that don't require hospitalization and otherwise mild symptoms	0-1 moderate exacerbations/year that don't require hospitalization but increased dyspnea	≥2 exacerbations or ≥1 exacerbations that require hospitalization/year but otherwise mild dyspnea	≥2 exacerbations or ≥1 exacerbations that require hospitalization/ year and severe dyspnea	As exacerbations increase, prescribers can add ICS such as triple therapy with LABA/LAMA/ICS. Care must be taken because ICS increases pneumonia risk.
Treatments	SAMA	LABA or LAMA	LAMA	LAMA/LABA combo	

TABLE 5 - Inhaled Medication Alphabet Soup

Beta-Agonists	Anticholinergics (also called Antimuscarinics or Muscarinic Antagonists)	Corticosteroids	Combinations
Short-Acting Beta-Agonist (SABA) • Salbutamol • Terbutaline	Short-Acting Muscarinic Antagonist (SAMA) • Ipratropium	Inhaled Corticosteroids (ICS) • Beclomethasone • Budesonide • Ciclesonide • Fluticasone • Mometasone	SABA/SAMA • Salbutamol/ipratropium
Long-Acting Beta-Agonist (LABA) • Formoterol • Indacaterol • Salmeterol	Long-Acting Muscarinic Antagonist (LAMA) • Aclidinium • Glycopyrronium • Tiotropium • Umeclidinium	Oral Corticosteroids • Prednisone	LABA/LAMA • Formoterol/aclidinium • Indacaterol/glycopyrronium • Olodaterol/tiotropium • Vilanterol/umeclidinium
			LABA/ICS • Formoterol/budesonide • Formoterol/mometasone • Salmeterol/fluticasone • Vilanterol/fluticasone
			LABA/LAMA/ICS • Indacaterol/glycopyrronium/mometasone • Vilanterol/umeclidinium/fluticasone

patients in your pharmacy use two or fewer SABA canisters per year? Maybe it is time to start flagging them for pharmacist follow-up.

When asthma symptoms occur >2 per month but less than daily, GINA recommends a daily low-dose ICS or PRN ICS-formoterol as a controller and reliever. When symptoms occur on most days of the week, GINA recommends a low-dose ICS-long-acting beta-agonist (ICS-LABA) combination as a controller and ICS-formoterol as a reliever. When the person has nighttime symptoms, GINA bumps the asthma medication recommendation to a medium-dose ICS-LABA as a controller and ICS-formoterol as a reliever. Sometimes combination inhalers are used to increase ease of administration. Medications like tiotropium (a long-acting anti-muscarinic antagonist [LAMA]) and an oral leukotriene receptor antagonist (LTRA) (montelukast) may be considered. Severely uncontrolled asthma may need short courses of oral corticosteroids (for example, prednisone) in addition to a high-dose ICS-LABA plus add-on therapy like tiotropium, or an injectable anti-IgE (omalizumab), anti-IL5/5R (e.g., mepolizumab) (immune modulating monoclonal antibody medications).

Every asthmatic should have a written asthma action plan.[8] If a patient doesn't have a written plan, inform the pharmacist. The pharmacist can write one in conjunction with the patient's prescriber, especially if the pharmacist is an asthma or respiratory educator.

Approach to treatment – COPD

The goal of COPD therapy is to reduce symptoms and the number and severity of future exacerbations.[2] All COPD risk factors (for example, occupational exposure, air pollution) should be reduced, but the most important COPD risk factor is smoking tobacco. To prevent and treat COPD, smoking cessation is key.[2] Nicotine replacement, varenicline, bupropion combined with smoking cessation counselling all reduce smoking rates. Influenza (annual) and pneumococcal immunizations reduce infections in people with COPD, which reduces their morbidity and mortality. Pulmonary rehabilitation improves symptoms, exercise tolerance, and quality of life. In patients with severe resting chronic hypoxemia, long-term oxygen therapy improves survival. Pharmacological therapy can reduce COPD symptoms and the frequency and severity of exacerbations, improve health status, and improve exercise tolerance. Inhaler technique should be checked regularly.[2]

The GOLD guidelines classify COPD patients into groups according to their symptoms, number of exacerbations, and hospitalizations. Group A have 0-1 moderate exacerbations per year that don't require trips to the emergency department and otherwise have mild symptoms. They start with a short-acting bronchodilator, usually ipratropium (a short-acting muscarinic antagonist [SAMA]). Short-acting bronchodilators manage symptoms only and don't improve disease progression. Group B has 0-1 non-hospital admission exacerbations per year, but their shortness of breath (dyspnea) is worse. They get a long-acting bronchodilator, such as a long-acting beta-agonist (LABA) or a long-acting muscarinic antagonist (LAMA). Group C has ≥2 exacerbations or ≥1 exacerbation requiring hospital admission per year, but otherwise mild dyspnea. They get a LAMA because LAMA alone prevents more exacerbations than LABA alone. Group D has ≥2 exacerbations or ≥1 exacerbation requiring hospital admission per year, and severe dyspnea. This group should get a combination of LAMA and LABA.[2]

As exacerbations become more of a problem, prescribers can add an ICS, such as triple therapy with LABA/LAMA/ICS. Addition of ICS should be reserved for when other treatments fail because ICSs increase pneumonia risk.[2]

In COPD, LABAs and LAMAs are preferred over short-acting agents unless the patient has very mild and occasional shortness of breath.[2]

Table 5 provides examples of SABAs, SAMAs, LAMAs, LABAs, and ICSs available in Canada.

Medications used to treat asthma and COPD

Most asthma or COPD medications are inhaled. These medications either open the airways or reduce inflammation in the lungs. Inhalation devices are equally effective when used properly. However, 70%–80% of patients may be using them improperly.[10,11,12] This gives technicians an opportunity to teach inhaler technique and improve the lives of people with respiratory problems. Non-inhaled medications are also highlighted below.

How to choose an inhalation device

Choose an inhalation device based on the person's physical capabilities (for example, inhalation strength, hand strength, dexterity, eyesight), preferences, and device cost.[2,11,12] MDIs tend to be the least expensive devices, but require coordination between actuating the device and inhaling, which can be surprisingly difficult.[17] Spacers can help.[13] Soft mist Inhalers require more hand strength to set up and use.[14] Dry powder inhalers are breath-activated, which eliminates the coordination part, but can require more inhalation strength.[15] Some people won't be able to breathe in enough volume or with enough force to use these devices properly.[16] Dry powder devices can be quite complicated to use.[18] Ask the person with the device open-ended questions and show them demo inhalers if possible. Showing online inhaler instructional videos can be helpful, because the person can review them at home later.

Table 6 summarizes key facts about devices used to deliver medications for asthma and COPD.

Short-acting beta-agonists (SABAs)

The most common SABA is salbutamol. It is usually inhaled through a metered-dose inhaler (MDI), but can be administered through nebulizer, orally, or intravenously. It opens up the airways quickly, but it doesn't last long. Salbutamol starts reducing airway resistance in five to 15 minutes. Peak pulmonary function improvement occurs in 60 to 90 minutes. Bronchodilator action lasts three to six hours.[17] SABAs are used in both asthma and COPD.

Long-acting beta-agonists (LABAs)

LABAs include formoterol, salmeterol and vilanterol. They can be be administered via MDIs, dry powder inhalers (Turbuhaler, Ellipta, Diskus) and soft mist inhalers (Respimat). LABAs' onset varies from four to over 30 minutes. Unlike SABAs, they open airways for eight to 12 hours.[18] LABAs are used for asthma and COPD. LABAs shouldn't be used without an ICS in asthma because of increased risk of death.[19]

Anticholinergics (SAMAs, LAMAs)

Anticholinergics open the airways, but differently than the beta-agonists. They have several names including anticholinergics, antimuscarinics and muscarinic antagonists. They are used more often in COPD than in asthma, but their role in moderate to severe asthma is increasing.

Short-Acting Muscarinic Antagonists (SAMAs)

Ipratropium is the SAMA available. Its onset

TABLE 6 - Devices used to deliver asthma and COPD medications

Device	How it works	Advantages	Disadvantages	Examples of medications available in this format*	Instructions for use*
Metered dose inhaler (MDI)	Propellant sprays a propellant/ medication mixture out of an actuator. Must coordinate spraying and inhaling.	Often less expensive, small, light, portable, many medications available, can be used with spacer.	Difficult to coordinate inhalation with device actuation. Most do not have a dose counter.	Single ingredient: salbutamol, fluticasone, salmeterol, beclomethasone, ipratropium, ciclesonide Combinations: fluticasone & salmeterol combo, formoterol & mometasone combo	Instructional video (MDI without spacer): http://www.lung.ca/lung-health/get-help/how-use-your-inhaler/mdi-no-spacer
Valved spacer	Valved spacers are partnered with MDIs for patients who have difficulty coordinating spraying a puff of medication from an MDI and inhaling at the same time. Almost any MDI user could benefit from using a valved spacer.	Makes MDIs easier to use, allows MDIs to be used in the very old and very young, med delivery to the lungs is similar with an MDI-spacer compared to a nebulizer. When spacers are used with ICSs, they can also reduce the chance of thrush (oral candidiasis).	Large and inconvenient to carry around; another item to purchase.	Any medication available in MDI format (see above)	Instructional video (MDI with spacer): http://www.lung.ca/lung-health/get-help/how-use-your-inhaler/mdi-spacer-adult
Soft mist inhaler	Medication released in fine, slow moving mist. Slower, smaller particles than MDI.	Small, slow droplets get deeper into lungs than MDIs.	Set up and use can be very difficult if person has limited hand strength or arthritis.	Respimat salbutamol & ipratropium combo, tiotropium & olodaterol combo, tiotropium	Instructional video (Respimat): https://www.lung.ca/lung-health/get-help/how-use-your-inhaler/respimat

Dry powder inhaler	Breath activated. Medication is only released when patient inhales. Depending on device, amount of powder inhaled varies from tiny to quite large.	Diskus, Ellipta, Turbuhaler, Twisthaler: fairly easy to use, only inhale small amounts of powder. Patients may or may not taste or feel the powder. Remind patients not to use an extra dose if they don't taste or feel the medicine.	Often more expensive than MDIs and can't use with spacer HandiHaler, Aerolizer, Breezhaler: complicated to use, must inhale large amounts of powder, require more inspiratory flow.	Diskus: salmeterol, salmeterol & fluticasone combo, salbutamol, fluticasone Ellipta: umeclidinium & vilanterol combo, fluticasone, fluticasone & vilanterol combo, umeclidinium, fluticasone & umeclidinium & vilanterol combo Turbuhaler: terbutaline, formoterol, budesonide, formoterol & budesonide combo Twisthaler: mometasone HandiHaler: Tiotropium Aerolizer: Formoterol Breezhaler: indacaterol & mometasone combo, indacaterol & glycopyrronium & mometasone combo, indacaterol, glycopyrronium, indacaterol & glycopyrronium combo Genuair: aclidinium & formoterol combo, aclidinium	Instructional video (Diskus): http://www.lung.ca/lung-health/get-help/how-use-your-inhaler/diskus Instructional video (Ellipta): http://www.lung.ca/lung-health/get-help/how-use-your-inhaler/ellipta Instructional video (Turbuhaler): http://www.lung.ca/lung-health/get-help/how-use-your-inhaler/turbuhaler%C2%AE Instructional video (Twisthaler) http://www.lung.ca/lung-health/get-help/how-use-your-inhaler/twisthaler Instructional video (HandiHaler): http://www.lung.ca/lung-health/get-help/how-use-your-inhaler/handihaler Instructional video (Aerolizer): http://www.youtube.com/watch?v=VvKi7OEKQYk Instructional video (Breezhaler): https://www.lung.ca/lung-health/get-help/how-use-your-inhaler/how-use-breezhaler Instructional video (Genuair) https://www.lung.ca/lung-health/get-help/how-use-your-inhaler/genuair

* If any device contains an inhaled corticosteroid (ICS), rinse the mouth out with water after use to help prevent thrush (oral candidiasis). Refer to each device's product monograph for specific instructions, as this table can't include all the instructions for use for every device. Please consult product monograph in addition to the videos for complete device instructions.

is 5-15 minutes, and its effect can last 2-6 hours. It can be given by MDI and soft mist inhaler. Used alone in very mild COPD or as a reliever in asthma and COPD.

Long Acting Muscarinic Antagonists (LAMAs)

LAMA's onset is 15-30 minutes and lasts 24 hours. LAMAs may take days to weeks of daily dosing to achieve steady state and maximum effect. Tiotropium is a LAMA given via a Handihaler or Soft Mist Inhaler. Aclidinium is in the Genuair format, glycopyrronium in the Breezhaler format, and umeclidinium in the Ellipta format.

Corticosteroids

Corticosteroids reduce lung inflammation, a driving force behind asthma. Instruct people on ICS to rinse mouth out with water after use to decrease the risk of thrush or oral candidiasis. For all devices, tell people to hold their breath for 10 seconds after inhaling, then exhale slowly. For ICS inhalers, I tell people to exhale slowly through their nose. I find telling people to exhale nasally forces them to slow their exhalation and I believe some of the corticosteroid may be retained in the nasal cavity. This may help the allergic rhinitis that many patients with asthma have, but I have no evidence to support this claim.

Inflammation is less problematic in COPD, but ICS can reduce COPD symptoms. However, ICS can increase pneumonia risk in COPD patients, so it should be added cautiously. Corticosteroids are often administered via inhalation in asthma and COPD. Corticosteroids like beclomethasone, budesonide, fluticasone, and mometasone can be administered via MDI, Turbuhaler, Diskus, Twisthaler and Ellipta. In severe flare-ups of either asthma or COPD, corticosteroids can be given orally. The most common oral corticosteroid is prednisone. In hospital, corticosteroids like methylprednisolone can be given intravenously. We try to avoid long-term oral corticosteroid use due to their many side effects.

Combination inhalers

ICS-formoterol (ICS/LABA) is the recommended reliever for all adults and adolescents with asthma, including very mild cases.[1] ICS-formoterol can be used as a controller in asthma as well.

COPD treatment starts SAMA or SABA and then escalates to LAMA alone. LABA/LAMA is second-line therapy, as severity increases. ICS/LABA can be used second-line in COPD and LABA/LAMA/ICS can be used third-line, but ICS therapy increases pneumonia risk and cost.

Leukotriene receptor antagonists

Medications like montelukast reduce

inflammation in the lungs by a different mechanism than corticosteroids. They are given orally and only used in asthma.

Theophylline

Theophylline is a methylxanthine that opens up the airways. It can be given orally or intravenously. It has a narrow therapeutic index and potential toxicities and requires blood level monitoring. It is no longer a recommended treatment in asthma or COPD. [1,2]

Other medications

Biologics

Expensive injectable medications, with names ending in "mab," are monoclonal antibodies that modify the immune system. Examples include omalizumab and mepolizumab. They are prescribed by specialists for severe asthma.[2]

Phosphodiesterase-4 inhibitors

These are used as add-on therapy to bronchodilators for COPD. They prevent the destruction of intracellular molecules and cyclic AMP, leading to airway inflammation reduction (for example, roflumilast, a daily oral tablet). Common side effects include diarrhea, abdominal pain, headache, backache, and sleep problems.[2]

Mucolytic agents

These drugs (for example, N-acetylcysteine) are used infrequently in COPD. They may be used in patients not receiving ICS and might reduce exacerbations. Side effects include diarrhea, vomiting, headache, taste disturbance, and rash.[2]

Antibiotics

Antibiotics, often macrolides (for example, azithromycin), are given to some people with COPD, with instructions to start when an exacerbation begins. Antibiotic use should be infrequent and only in severe cases of COPD with the most exacerbations, because every additional dose of antibiotic increases the risk of antibiotic-resistant infections.[2]

Poor Inhaler Technique

Metered-dose inhalers, dry powder inhalers and soft mist inhalers are all difficult to use without training. A 2011 article in *Respiratory Medicine* found critical mistakes widely distributed among users of all the devices they surveyed including MDIs, Diskus, HandiHaler and Turbuhaler. Inhaler misuse was associated with increased risk of hospitalization, emergency room visits, and poor disease control. Independently of the inhaler, they found the strongest association between inhaler misuse and older age, lower formal education and lack of instruction of proper device use by a healthcare provider.[23]

Immunizations

Immunizations can prevent respiratory problems. All asthma and COPD patients over the age of six months, including pregnant women, should get a flu shot yearly.[20] If working in a permissible jurisdiction, technicians should obtain qualifications to give immunizations. Pneumococcal vaccine is probably more important in COPD patients but can help patients with asthma.[21] With their older age and probable smoking history, COPD patients will often qualify for a pneumococcal vaccine that is paid for by the province, but this varies across Canada. It is crucially important that patients with asthma or COPD receive a COVID-19 vaccine, as they become more available.[22]

Role of the pharmacy technician

Pharmacy technicians need to have a general understanding of asthma and COPD and their treatments. Screening people with asthma and COPD to ensure if they are vaccinated, having signs of poor disease control, or filling their SABA too often will help patients. Alert the pharmacist if a COPD patient (or any patient) expresses interest in smoking cessation.

Incorrect use of inhalation devices can lead to treatment failure. Technicians can help by demonstrating the device for the patient and then having the patient demonstrate the device back to them. Use open-ended question like, "What was the most difficult part of using the inhaler for you?" Ideally, in addition to teaching a patient how to use the device when it is first prescribed, ask the patient to demonstrate how they use their device on each refill. Unfortunately, many patients with asthma or COPD falsely believe they are breathing device experts. Tactfully correct them if they are having problems.

Conclusion

Asthma and COPD medications are delivered with devices that require significant education to be used properly. Technicians can play an important role in teaching patients how to use these devices when first prescribed and reviewing their proper use upon refill. Screening people with asthma and COPD for problems like smoking, lack of immunization, overuse of SABAs, and signs of poor disease control provide wonderful opportunities for technicians to enhance patient care. You will find that when you help someone to breathe, you will definitely matter.

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QUESTIONS

Please select the best answer for each question and answer online at eCortex.ca for instant results.

1. Key features that define asthma are:

a) chronic airway inflammation, history of respiratory symptoms (wheeze, shortness of breath, chest tightness and cough), and variable expiratory airflow limitation.
b) persistent respiratory symptoms, airflow limitation due to airway and/or alveolar abnormalities, caused by significant exposure to noxious particles or gases.
c) repeated viral infections causing progressive alveolar destruction and lung deterioration.
d) an enzyme deficiency which increases mucus viscosity over time.

2. Key features that define COPD are:

a) chronic airway inflammation, history of respiratory symptoms (wheeze, shortness of breath, chest tightness and cough), and variable expiratory airflow limitation.
b) persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities, caused by significant exposure to noxious particles or gases.
c) a condition characterized by repeated viral infections causing progressive alveolar destruction and lung deterioration.
d) a condition characterized by an enzyme deficiency which over time increases mucus viscosity.

3. Differences between asthma and COPD include all the following, EXCEPT:

a) Asthma usually begins before the age of 40 and COPD begins after the age of 40.
b) Smoking may make asthma symptoms worse but doesn't cause the disease; COPD patients usually have a >10 pack-year smoking history.
c) Allergies occur at the same rate in people with asthma or COPD.
d) Asthma symptoms are relatively stable over time, with some exacerbations; COPD symptoms get worse over time, with some exacerbations.

4. An example of an anticholinergic medication used for asthma or COPD is:

a) salbutamol
b) fluticasone
c) formoterol
d) tiotropium

5. Metered dose inhalers (MDIs) are:

a) asthma or COPD inhalation devices with a propellant that sprays the medication out of an actuator.
b) asthma or COPD inhalation devices that deliver powdered medication in a breath-activated fashion.
c) devices that CANNOT be used with a valved spacer.
d) considered to be the easiest asthma or COPD device for patients to use properly.

6. All the following are signs that a patient has poorly controlled asthma and should be referred to the pharmacist EXCEPT:

a) Daytime symptoms four times per week.
b) Nighttime symptoms twice per week.
c) Need for a reliever (SABA or bud/form) once per week.
d) Misses work due to asthma once per month.

7. Turbuhalers are:
a) asthma or COPD inhalation devices with a propellant that sprays the medication out of an actuator.
b) asthma or COPD inhalation devices that deliver powdered medication in a breath-activated fashion.
c) devices that must be shaken before every puff.
d) devices that deliver medication deeply into the lungs when combined with a valved spacer.

8. Which of the following acronym definitions is INCORRECT?
a) SABA – short-acting beta-agonist
b) LAMA – long-acting muscarinic antagonist
c) ICS – inhaled catecholamine steroid
d) LABA – long-acting beta-agonist

9. According to the GINA guidelines, which can be used ALONE in adults and adolescents as a reliever in mild asthma
a) salbutamol
b) low-dose ICS-formoterol combination inhaler
c) tiotropium
d) salmeterol

10. Valved spacers make it easier for the very old and very young to use MDIs and help the inhaled medication get deeper into the lungs.
a) True b) False

11. High SABA use almost doubles the risk of exacerbation versus low SABA use in asthma. What does the SABINA group say is low SABA use per year?
a) 0-2 canisters
b) 3-4 canisters
c) 5-6 canisters
d) 7-8 canisters

12. Which of the following is part of the instructions for using an Ellipta?
a) Open the Ellipta cover loads up a dose.
b) Shake the Ellipta before use.
c) Blow into the device.
d) Use a valved space to improve the performance of the Ellipta.

13. Loading the canister into a Respimat is easy and doesn't take much hand strength.
a) True b) False

14. Who should get an annual flu shot?
a) People with asthma
b) People with COPD
c) Pregnant people
d) All of the above

15. What is the main reason ICS use alone (steroid puffers) is avoided in COPD?
a) ICS use increases the chance of thrush or oral candidiasis.
b) ICS use increases the chance of pneumonia.
c) ICS use can stunt the growth of children.
d) ICS use can masculinize female patients.

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3. a b c d	**6.** a b c d	**9.** a b c d	**12.** a b c d	**15.** a b c d

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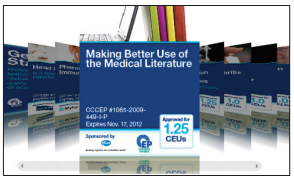

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