

> Statement of Objectives

After reading this lesson you will be able to:

1. Understand the economic burden of asthma in Canada
2. Understand the advantages, disadvantages and age-appropriate recommendations of commonly-used asthma devices in the community (metered-dose inhalers and dry-powder inhalers)
3. Understand types of non-adherence in asthma patients
4. Identify reasons for non-adherence in asthma patients
5. Understand ways in which the pharmacist can play an important role in improving adherence to asthma medications

> Instructions

1. After carefully reading this lesson, study each question and select the one answer you believe to be correct. Circle the appropriate letter on the attached reply card.
2. Complete the card and mail, or fax to (416) 764-3937.
3. Your reply card will be marked and you will be advised of your results in a letter from Rogers Publishing.
4. To pass this lesson, a grade of 70% (14 out of 20) is required. If you pass, your CEU(s) will be recorded with the relevant provincial authority(ies).
(Note: some provinces require individual pharmacists to notify them.)



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ADHERENCE TO ASTHMA THERAPY

by Shelley Diamond, B.Sc.Pharm.

ASTHMA IN CANADA

ASTHMA IS ONE OF THE MOST COMMON chronic conditions affecting Canadians. According to the 1996 to 1997 National Population Health Survey, more than 2.2 million Canadians have been diagnosed with asthma by a physician.¹ It is estimated that 10% of children and 5% of adults have active asthma. The incidence of asthma has been increasing in children over the past 15 years. It is estimated that in Canada, more than 500 people die from asthma every year.²

Asthma mortality rates have decreased in Canada compared to rates in the 1970's and 1980's, except in the 15 to 24 age group. Hospitalization rates have decreased since the mid-1990's, but remain higher than the rate in the 1970's.¹ The decrease in mortality rates, despite the increase in prevalence of asthma, indicates improved management of asthma in more recent years.

ECONOMIC BURDEN OF ASTHMA

ASTHMA PLACES A HEAVY BURDEN ON THE nation's healthcare expenditures, reduces productivity and seriously affects the quality of life for individuals with asthma and their families. Direct costs include inpatient care, emergency services, physician and nursing services, ambulance use, asthma drugs and devices, outpatient diagnostic tests, research and education. Indirect costs include loss of productivity due to absence from work, inability to perform housekeeping activities, need to care for children with asthma who are absent from

school, time spent traveling and waiting for medical care, and premature death from asthma. A study in 1990 estimated that the total cost of asthma at that time was between \$504 and \$648 million dollars (Canadian).³ The largest single component of direct costs was drugs (\$124 million). It is therefore important that patients receive the most appropriate therapy and drug delivery device. Non-adherence can result in increased economic burden as a result of additional physician and emergency room visits, hospitalizations, as well as loss of productivity due to missed days at work. People with difficult-to-control asthma comprise the majority of asthma-associated costs, with 80% of asthma-associated costs driven by 20% of the asthma population.

ASTHMA MANAGEMENT

ASTHMA IS CHARACTERIZED BY PAROXYSMAL OR persistent symptoms such as dyspnea, chest tightness, wheezing, sputum production and cough associated with variable airflow limitation and a variable degree of airway hyper-responsiveness to endogenous or exogenous stimuli. Inflammation and its effects on airway structure are considered to be the main mechanisms leading to the development and maintenance of asthma. The main thrust of asthma therapy is to limit exposure to triggering factors and reduce the inflammatory process using anti-inflammatory agents.⁴

Guidelines in determining parameters for the management of medical conditions are well established. The Canadian

Asthma Consensus Guidelines were initially released in 1995, revised in 1999, and updated in 2001.⁵

The guidelines include several key criteria to assess asthma control. These criteria should be used by health professionals to assess their asthma patients' control. *Acceptable* control, as per the guidelines means:

- Daytime symptoms, not related to exercise, less than 4 days per week
- Night-time awakening less than 1 night per week
- Normal physical activity
- Mild, infrequent exacerbations
- No absenteeism from school or work due to asthma
- Fewer than 4 doses per week of short-acting beta₂-agonist needed+
- FEV₁ or PEF 90% of personal best or greater
- Diurnal variability in PEF less than 10% to 15%

+ = *Apart from 1 dose per day before exercise.*

FEV₁ = *Forced expiratory volume in 1s.*

PEF = *Peak expiratory flow.*

Implementing these guidelines is important and challenging. To make these guidelines widely available, they can be accessed via the Internet at www.asthmaguidelines.com. A survey based on these guidelines and completed in 1999, found that Canadians may not be optimally treated for their asthma and are suffering with a lower quality of life.⁶ As well, there is a significant communications gap between asthma patients and physicians. Over 90% of patients feel their asthma is controlled, and the majority of physicians believe they are obtaining optimal control of their patients' asthma. However, over 50% of patients are poorly controlled.⁶ Most patients do not understand the disease process or the role of medications used to

TABLE 1 RELIEVER MEDICATIONS (for intermittent symptoms)

<i>Short/Fast-Acting Beta₂ Agonist Inhalers</i>	
Salbutamol	MDI, DPI
Terbutaline	DPI
Formoterol	DPI
Fenoterol	MDI
<i>Anticholinergics (rarely)</i>	
Ipratropium	MDI
CONTROLLER MEDICATIONS (maintenance therapy)	
<i>Corticosteroids</i>	
Beclomethasone dipropionate	MDI
Budesonide	DPI
Fluticasone	MDI, DPI
<i>Long-Acting Beta₂ Agonist</i>	
Formoterol	DPI
Salmeterol	MDI, DPI
<i>Corticosteroid/Beta₂ Agonist Combinations</i>	
Budesonide + Formoterol	DPI
Fluticasone + Salmeterol	MDI, DPI
<i>Leukotriene Receptor Antagonists</i>	
Zafirlukast	(oral)
Montelukast	(oral)
<i>Nonsteroidal Anti-Inflammatory Agents</i>	
Sodium cromoglycate	MDI, DPI
Nedocromil	MDI
Ketotifen	(oral)
ADDITIONAL ASTHMA MEDICATIONS	
Theophylline and derivatives	(oral)
(MDI= metered dose inhaler; DPI=dry powdered inhaler)	

treat the disease. This lack of basic knowledge is likely a major reason for poor adherence. Teaching these basics should be done, and reviewed regularly, by all health professionals in contact with people with asthma, including community pharmacists.

ASTHMA MEDICATIONS

INHALATION THERAPY FOR ASTHMA IS THE preferred route due to rapid delivery and

onset of action, excellent therapeutic efficacy, and reduced risk for side effects. Table 1 lists the maintenance medications available to manage asthma and their dosage forms.

ASTHMA DEVICES

Comparison of Inhaler Devices And Appropriate Technique

The delivery device, drug formulation and

FACULTY ADHERENCE TO ASTHMA THERAPY

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REVIEWERS

All lessons are reviewed by pharmacists for

accuracy, currency and relevance to current pharmacy practice.

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patient technique determine the dose of inhaled medication that will ultimately reach the lungs. Currently there are several choices of delivery device. Nebulizers with either a face mask or mouth piece are an option but are now more often reserved for acute episodes of asthma in hospital settings. This discussion will focus on the most commonly prescribed asthma devices. These include the metered-dose inhaler and dry-powder inhalers.

The Metered Dose Inhaler (MDI)

The MDI was the first portable asthma device and continues to be the most widely used asthma delivery system. Recently, the propellant for MDIs has changed from chlorofluorocarbon (CFC) to an alternative propellant, hydrofluoroalkane (HFA). CFCs have been banned as a result of their ability to damage the ozone layer.⁷ The newer HFA formulations have resulted in decreased oropharyngeal deposition, improved fine particulate fraction and increased lung deposition.⁸ Patients switched to HFA inhalers will have noted several changes, such as a warmer, softer spray, a different taste and a lighter canister.^{9,10} Also, there is no “tail-off effect” with HFA formulation as the canister nears empty, and no reduction in the emitted dose at ambient temperatures as low as -20°C.^{11,12} Most MDIs require priming before their first use, or if left unused for an extended period of time. Refer to the product monograph for individual recommendations on priming.

The main challenge of the metered-dose inhaler is the need for good hand-lung coordination, although the addition of a spacer device reduces this significantly. The physical demand of actuating the canister may be a challenge for elderly patients.

Dry Powder Inhalers (DPIs)

Dry-powder inhalers have had significant growth in the asthma market in recent years, largely as a result of the ban on CFC use in metered-dose inhalers.^{12,13} Several dry-powder inhalers are available in Canada (Turbuhaler®, Diskus®, Diskhaler®, Spinhaler®, Aerolizer®). They are all breath-activated and eliminate the coordination problem seen with the MDI alone. The biggest limitation with the use of DPIs is inadequate inspiratory flow rate, but with appropriate training, most of these devices can be used by the major-

TABLE 2 Choice of Inhaler Device for Long-term Treatment in Children ≤12 Years²⁴

Age Group	Preferred Device	Alternative Device
<4 years	Pressurized MDI plus spacer with face mask	Nebulizer with face mask
4-6 years	Pressurized MDI plus spacer with mouthpiece	Nebulizer with face mask
>6 years	DPI or Pressurized MDI plus spacer with mouthpiece	Nebulizer with mouthpiece

ity of asthma patients. This lesson will focus on the two most common devices, the Turbuhaler® and the Diskus®.

The Turbuhaler®

The Turbuhaler is a multiple-dose, dry powder, “breath-activated” device which allows the patient to control medication delivery. This becomes an advantage over the metered-dose inhaler because little hand-lung coordination is required. The Turbuhaler is small and portable, provides advance warning of the remaining dose(s) and a spacing device is not required. It contains 200 doses which may last up to 6 to 8 weeks, depending on the prescribed dose.

Challenges with the Turbuhaler include deep, forceful inspiration required to obtain a dose and the inability to “feel” or taste a dose. As well, humidity (e.g. if stored in a bathroom or left open) may cause the medication to clump, reducing its effectiveness.¹⁴ Lastly, if the patient exhales into the device before inhalation, the dose is lost. It may also affect subsequent doses as a result of the added humidity from the patient’s breath. It is important that patients hold Turbuhaler in an upright (vertical) position to ensure proper dose loading. Patients with an IgE-mediated hypersensitivity to lactose should not use Symbicort® Turbuhaler®, Pulmicort® and Bricanyl® do not contain a lactose carrier.

The Diskus®

The Diskus is another multi-purpose, dry powder, “breath-activated” device. It shares many of the benefits of the Turbuhaler, such as patient-controlled inhalation, ease of use, portability and a dose counter which counts down each dose. The Diskus protects each dose of medication from the environment in sealed, individual blisters so humidity does not affect drug particles. As a result, consistent dosing is provided

each time. It is suitable for patients of various ages and can be used for children as young as 4 years and the elderly since it requires little inspiratory effort to obtain a dose.¹⁵ It uses a lactose carrier, so patients with an IgE-mediated allergic reaction to lactose or milk should not use the Diskus. Since each Diskus contains only 60 doses, a new device is needed each month. A rapid inspiratory effort is required to obtain a dose.

Choosing an Appropriate Asthma Device

Many articles have been published lately about choosing the most appropriate asthma device.^{12,13,16-18} It is essential that the inhalation device that best fits the needs of the individual patient be chosen. The MDI with a spacer device can be used for all age groups. A spacer with an appropriately sized face mask can be used in children as young as 2 months.^{19,20} It is important to ensure that children using an MDI and a spacer with face mask can tolerate the device, since drug delivery to the lungs is impaired if the child is afraid, crying, hyperventilating or screaming.^{21,22} Nasal breathing can decrease lung deposition by up to 67%, therefore, it is recommended that inhalation using a mouthpiece rather than a mask be used as soon as the child is old enough.²³ Dry-powder inhalers can provide adequate drug delivery in some patients by the time they reach 4 years, but generally aren’t used until the child is at least 5 or 6 years old. This is as a result of the difficulty in teaching a younger child to take the required forceful inspiration to obtain a complete dose. Table 2 contains recommendations for choosing an appropriate asthma device for a child.

The elderly are also challenged with coordination issues of certain inhaled asthma medications, but there exists a host of unique considerations for this

patient population: limitations in mobility as a result of neuromuscular disorders, joint pains and deformity, loss of manual dexterity and vision problems.²⁵

In general, there appears to be no difference in the clinical effectiveness between dry-powder inhalers and metered-dose inhalers, with or without a spacer device, when used correctly.^{26,27} However, proper technique with a specific device cannot always be achieved by some patients. Other options need to be considered. Cost-effectiveness favours MDIs, however, portability may be an issue to consider, especially when a spacer device is used with an MDI. Other factors to consider include the incidence of side effects (e.g. candidiasis, dysphonia), coordination or disability issues, effects of temperature on the medication and number of doses per container.

Use of Spacing Devices in Asthma

Spacers are usually used with an MDI to overcome coordination problems and reduce local oropharyngeal side effects (e.g. thrush, dysphonia) when using inhaled glucocorticosteroids. In some cases, it may increase the amount of drug deposited in the airways, possibly as a result of slowing the jet of medication which allows the propellant to evaporate. This results in finer particles which more easily reach the lower airways.

Use of Peak Flow Meters (PFMs) in Asthma

Monitoring peak expiratory flow (PEF) using a home PFM may be useful in some patients, particularly those who are poor perceivers of airflow obstruction.⁴ If PEF monitoring is used, it should be linked to an appropriate action plan. Patients need to know how to use these meters correctly. Pharmacists can play an active role in demonstrating how to use PFMs; how to chart results; and how to incorporate this with an action plan. Many studies have shown that use of a symptom- or PEF-triggered action plan is effective when combined with individual asthma education.^{28,29}

ADHERENCE ISSUES IN ASTHMA

NON-COMPLIANCE OR POOR ADHERENCE IS A significant issue and may be one factor for the failure to improve morbidity in the treatment of patients with asthma.³⁰⁻³³ Compliance with inhaled respiratory

TABLE 3 Factors Involved in Non-Adherence

Patient-Related Factors
Misunderstanding or lack of instruction
Fears about side effects
Unexpressed/undiscussed fears or concerns
Anger about condition or treatment
Cultural issues
Forgetfulness
Religious issues
Attitudes toward ill health
Disease-Related
Inappropriate expectations
Underestimation of severity
Stigmatization
Treatment-Related Factors
Difficulties with inhaler devices
Awkward regimes
Side effects
Cost of medication
Dislike of medication
Distant pharmacies
Health Professional-Related
Dissatisfaction with health-care professionals
Poor supervision, training or follow-up

medication is invariably poor – in the range of 40 to 50%.^{34,35} The terms *compliance* and *adherence* are often used interchangeably, but *adherence* has become a more common term since it suggests a more active role for the patient. *Adherence* implies a voluntary choice by the patient to closely follow a treatment plan, whereas *compliance* implies passive submission to the prescriber's treatment regimen.³⁶

Types of non-adherence

Three types of non-compliance have been described: unwitting non-compliance, erratic compliance, and intentional or so-called "intelligent non-compliance."³⁷

In *unwitting non-compliance*, the patient is unaware that he is not complying. For example, he is using his asthma device incorrectly due to lack of knowledge. Reasons for this type of non-compliance include: poor understanding of the disease, medications and medication regimen; language barriers; social and cultural differences; and in the elderly, dementia.

Erratic compliance occurs when patients

know how and when to take their medications, but fail to follow a health professional's advice. Patient factors include being too busy, too forgetful or too stressed. Complex regimens add to the problem. Therefore, simplifying the regimen, helpful reminders and making medication-taking an integral part of the patient's daily routine may be helpful. For example, taking an inhaled corticosteroid before brushing one's teeth in the morning and at night.

In *intentional* or "*intelligent*" *non-compliance*, the patient deliberately stops or changes therapy for personal reasons. This behaviour is the patient's response to his illness and surroundings, fear of side effects, belief that he is cured, denial, poor knowledge of the chronic nature of asthma, perceived ineffectiveness of the therapy, fear of addiction and, in certain situations, medication cost.^{38,39}

Reasons for non-adherence

Adherence may be influenced by factors related to the patient, disease, treatment and healthcare professional.

a) Patient-Related

- *Lack of knowledge*: Patient factors leading to non-adherence include lack of knowledge about the disease and its management. The patient may be noncompliant because he rejects the diagnosis or because of underlying psychopathology.

- *Acceptance of poor health as the norm*: Many people who have severe asthma symptoms for a long time forget what good health feels like and accept a less than optimal health status. The Asthma in Canada Survey found that many Canadians continue to wake up at night with symptoms and believe this is a normal consequence of asthma. A better approach than emphasizing disease severity is to help them realize just how good they might feel if they do adhere to their medications.

b) Disease-Related

- *Stigma*: Patients may regard asthma as a stigma, e.g. when using inhalers in public, seeking employment or needing time off work. The potentially negative social image of chronic respiratory illness is a particular problem for children and adolescents.⁴⁰

c) Treatment-Related

- *Cost of drugs*: Many asthma medications can be costly if the patient doesn't have health insurance. Encouraging lower-cost medications, where they exist, may help adherence. Temporary assistance may be

available through some manufacturers' access programs. Pharmacists can encourage patients by helping them understand that a lost day from work can be more costly. The cost-benefit must be weighed.

- *Lag time*: It may take days or weeks to feel the benefits of inhaled steroids and this may result in patients stopping asthma medication as they see no benefit early on.
- *Adverse effects*: Although many parents of children on inhaled steroids are concerned about possible side effects, it is equally important to reinforce the risks of not taking medication.

- *Choice of asthma device*: The mode of medication delivery may play a large part in non-compliance seen with asthma medication. Examples include:

- With the Turbuhaler, patient may feel that he is not getting the medication because he can't feel the dose, and may stop using it.
- If 2 or 3 different medications are prescribed with 2 or 3 different delivery methods, (e.g. concurrent use of MDI and DPI), it may add to confusion in technique and lead to poor adherence.
- Some of the new HFA inhalers may not fit older spacing devices.
- If lids and prescription labels are interchangeable for different medications (e.g. Turbuhaler), it can result in the patient taking the incorrect medication.

- *Understanding the roles of medication*: Patients may not understand the difference in the roles of the reliever and preventer medication. Since an immediate effect is obtained with short-acting beta₂-agonists, there is a tendency to overuse these medications. Since the immediate effects of the inhaled corticosteroids cannot be felt, there is a tendency to underestimate their importance.

- *Inappropriate device technique*: It has been demonstrated that many people do not use their asthma device correctly.⁴¹⁻⁴³ Common errors with the MDI include leaving the cap on, not exhaling prior to activation, firing 2 puffs at once, not tilting the health slightly back, and not holding the breath after inhalation. Turbuhaler errors include loading the dose horizontally rather than vertically and mixing up the covers. Problems with technique, such as not exhaling prior to inhalation, are commonly seen with the use of all DPIs. As a result, the medication may not reach the lower airways and asthma symptoms may

TABLE 4 Practical measures to increase adherence to asthma medications

Simplify

- Avoid complex drug regimens
- Use lowest dosage intervals (i.e. once or twice-daily)
- Use combination therapy where appropriate

Educate

- Provide written education material
- Provide written record of medication names and dosages (action plan)
- Check asthma device technique periodically
- Provide appointment-based education

Action Plan

- Include the patient in the process of determining the therapeutic plan
- Positively reinforce specific efforts to improve adherence
- Elicit family support

persist. Patients may feel no added benefit from using the medication and may stop using it. Poor inhaler technique is a major reason for unintentional underdosing and can easily be interpreted as non-compliance.⁴⁴ It is essential that a hands-on demonstration be done for the patient in addition to written material for later reinforcement, to ensure that the patient can use the device correctly.^{45,46}

- *Frequency of administration*: Simplifying medication regimen can have a large impact on compliance.
- *Fear of dependency*: Fear of becoming dependent on the medication is common. For those who have symptom-free periods, they may consider the treatment unnecessary.

d) Health Professional-Related

- *Education and communication*: Although asthma education is important, it is not always enough to increase adherence. Communication between health professional and patient may be more important. It is difficult for a health professional to identify which patients are adherent and which are not. It is important to give patients the opportunity to raise concerns about their medication. This is consistent with research on the determinants of adherence which tells us that patients typically only follow recommendations they really believe in and those they actually have the ability to carry out.³³ Cognition, beliefs, attitudes, values and emotions all play an important role in motivating patients to follow a treatment plan. All of these areas need to be explored with the patient to identify which motivator they will respond to.

Many articles have focused on compli-

ance with asthma medication and can be referenced for further detail. Table 3 lists the factors that need to be considered when assessing patient non-adherence.

AIDS FOR INCREASING ADHERENCE TO ASTHMA MEDICATIONS

MANY OPTIONS ARE AVAILABLE TO PROMOTE patient adherence, however, patient education is not sufficient to promote behaviour change. The patient's degree of readiness to change is also a factor in whether or not the intervention will be successful. The Transtheoretical Model of Change, a theoretical model of behaviour change, has been the basis for developing effective interventions to promote health behaviour change.⁴⁷ Pharmacists interested in theories and principles of health education applied to asthma may find this information valuable to strengthen asthma interventions.^{48,49}

The physical options available to augment adherence include memory aids, which can be as simple as a reminder note or as elaborate as an electronic device; refill reminders which can be manual or automated; and follow-up calls.

Addressing non-adherence in patients

When questioning a patient about adherence, it is more beneficial to ask questions in a neutral, non-judgmental way that makes it "safe" for patients to respond truthfully. By identifying each patient's problem, the pharmacist uses counselling time effectively. Some of the following questions may encourage an honest response.⁵⁰

- Is your breathing waking you up at night?
- Do you have symptoms when you get up in the morning?

- How many times a day do you take your bronchodilator (reliever)?
- What activities make you short of breath?
- What activities have you cut down on?
- When you had your last cold, did it clear up or did you still have symptoms left over?

By identifying each patient's problem, and dealing with one issue at a time, the pharmacist uses counselling time effectively. Assessing patients' medication-taking behaviour during future visits to the pharmacy or with follow-up phone calls is important. Patients' beliefs and concerns about their illness and medication can change over time and affect their adherence. Pharmacists can ensure that those beliefs change positively and result in better health outcomes by regularly discussing their asthma with them.

ROLE OF THE PHARMACIST AND ASTHMA MEDICATION ADHERENCE

APPROPRIATE ASTHMA INTERVENTIONS FOR A pharmacist include:

Education

- Teach correct inhaler technique when patients pick up their asthma medication. Re-assess and reinforce technique periodically. Teaching appropriate technique includes a demonstration by the patient to confirm their understanding, followed by necessary corrections as required.
- Ensure that spacers are recommended to patients who will benefit from this device.
- Ensure patients understand the basic principles of the disease, highlighting inflammation and muscle constriction.
- Ensure patients understand the role of medications. Using inhaled corticosteroids on a regular basis in order to achieve good asthma control is a key message for pharmacists to focus on because it may have a significant effect on the patient's health outcome.

Assessment

- Regular assessment of asthma technique.
- Assess adherence to therapeutic regimen.
- Assess asthma control. This may include asthma symptom review or medication refill review from the patient's profile.
- Ensure the patient understands the use of an asthma action plan.

Advocacy

- Recommend medication changes with the physician where appropriate.
- Recommend environmental changes in the home and community.
- Recommend device changes where

deemed necessary for improved patient outcome.

With respect to the pharmacist's involvement in improving adherence to asthma medications, no single solution will improve compliance in all patients. Simplifying the treatment regimen or providing memory aids will help some patients, while education or psychological counselling will be more appropriate for others. Involving the patient in treatment decisions will set an atmosphere of mutual responsibility and improved adherence to medicine-taking.

Many studies have demonstrated the value of the pharmacist with respect to asthma education.⁵¹⁻⁵³ The strategic position of pharmacists within the community allows frequent interactions with many patients. Pharmacists are, therefore, a valuable resource in educating patients and impacting behavioural change with regard to asthma treatment adherence. A recent study has demonstrated the impact of pharmaceutical care provided to asthma patients by specially-trained community pharmacists.⁵⁴ As a result of this intervention, pharmacists had a significant effect on clinical, economic and humanistic outcome measures in this group of asthma patients. Pharmacists who engage in these intensive programs, usually appointment-based, have an important role in enabling asthma patients to live full, active and productive lives.

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QUESTIONS

1. What is NOT a direct cost of asthma?

- a) nursing care
- b) asthma medications
- c) spirometry
- d) school absenteeism
- e) asthma education

2. What would indicate a loss of asthma control?

- a) using a beta₂-agonist once every week
- b) 5% diurnal variability in PEF
- c) daytime coughing twice weekly
- d) nighttime awakening once weekly
- e) need to use beta₂-agonist every day before exercise

3. Which is NOT a "hallmark" sign of asthma?

- a) wheezing
- b) nasal congestion
- c) shortness of breath
- d) chest tightness
- e) cough

4. Which medication can be used as both a reliever and controller medication for asthma management?

- a) salbutamol
- b) salmeterol
- c) formoterol
- d) terbutaline
- e) fenoterol

CASE STUDY #1

Susan is 25-years old and presents to your pharmacy with a new prescription for budesonide dry powder inhaler, 400 micrograms, one inhalation twice daily and salbutamol HFA MDI 100 micrograms, 1 to 2 puffs every 4 hours as needed). She has had several prescriptions filled in the past for salbutamol for a history of asthma.

Her asthma has been worse lately, and she has been using her salbutamol inhaler at least once daily to relieve her chest tightness and wheezing. She also wakes up at night approximately once or twice a week for the past several weeks. She does not use a peak flow meter to monitor her symptoms. She is otherwise well, does not smoke and takes no other medications. She asks how long it will take as she only has a few minutes to wait since she needs to return to her work and "is a very busy person with very little time to spare."

5. Which is TRUE with respect to Susan's salbutamol HFA MDI?

- a) DPIs are now being used more than MDIs in Canada.
- b) There is no added benefit to using a spacer device with her MDI.
- c) The MDI is an appropriate asthma device for adults only.
- d) The biggest limitation of this device is the need for good hand-lung coordination.

6. Based on what you know so far and Susan's need to get back to her busy life, which type of non-compliance would you suspect may occur in this situation?

- a) unwitting non-compliance
- b) erratic compliance
- c) intentional non-compliance
- d) intelligent non-compliance
- e) it is unreasonable to suspect that she would be non-compliant since most patients take their asthma medications as prescribed.

7. Which is NOT a reason why patients fail to adhere to their medi-

cation regimen?

- a) chronic therapy
- b) forgetfulness
- c) health beliefs
- d) ineffectiveness of medication
- e) increasing age

When Susan returns for a refill of her salbutamol inhaler, you find out that she has not been using her inhaled corticosteroids because she is "far too busy to remember" and finds that when she has asthma symptoms, her "other inhaler works just fine."

8. Which intervention is the most important with respect to impacting Susan's adherence to her medication regimen?

- a) Suggest that her doctor switch one of her medications in order for her to become familiar with only one type of asthma device.
- b) Suggest that she ask her doctor to change her inhaled corticosteroids to once daily to simplify her drug regimen.
- c) Involve Susan in the treatment plan to determine the most suitable time of day for her to take her inhaled corticosteroids.
- d) Ensure that she uses a peak flow meter regularly.
- e) Switch to a combination product in order to reduce the number of devices she needs.

9. To get a true sense of Susan's adherence to her inhaled corticosteroids, which question would be most helpful in getting an informative answer?

- a) Are you using your inhaled corticosteroid?

- b) How often do you take your inhaled corticosteroid?
 c) From my records, I see that you are not using your inhaled corticosteroids. Do you have any concerns you would like to discuss?
 d) I know you are a busy person, and many busy people have difficulty taking medication. Has this been a problem for you?

10. Assuming that you have done an effective job in helping Susan understand her medication and the importance of becoming adherent, yet she still fails to adhere, what is the most likely reason?

- a) patient motivation
 b) failure to communicate
 c) patient knowledge
 d) time limitations
 e) lack of follow-up

CASE STUDY #2

Jamie, a 16-year-old boy comes into the pharmacy with his mother who is very frustrated that her son will not take his current medications which include salbutamol HFA MDI 2 puffs q4h prn, fluticasone propionate 50 mcg/puff 2 puffs bid with a spacing device, and salmeterol 2 puffs bid with a spacing device. He has had a few asthma exacerbations in the past year with missed days from school. He has made the school football team but has had to miss several practices as a result of his asthma symptoms.

11. Which age group has not seen a decrease in mortality rates from asthma in recent years?

- a) less than 5 years of age
 b) 5-14 years of age
 c) 15-24 years of age
 d) 25-45 years of age
 e) >65 years of age

12. What is the most likely issue for Jamie's non-adherence to medications?

- a) He is too young to be responsible for his medication-taking.
 b) He finds the use of the asthma devices too difficult.
 c) He is at the age where the social stigma of using a large asthma device in public is likely to be an issue.
 d) He does not understand the potential consequences of not adhering to his medication regimen.
 e) c and d

13. Initially, which approach might be the most helpful in improving Jamie's compliance with asthma medications?

- a) Consider calling his physician to recommend switching to a more portable, less-conspicuous dry-powdered inhaler.
 b) Explain to him that there are serious consequences if he does not take his asthma medication.
 c) Assess how he uses his metered-dose inhaler and spacer device.
 d) Provide him with written information about asthma.

14. What could you initially simplify with Jamie's medication regimen?

- a) less frequent dosing of his steroid medication
 b) suggest the combination of steroid and long-acting beta₂-agonist
 c) teach him how to use an MDI alone
 d) the regimen cannot be simplified any further

15. Which technique is the most time-efficient and effective for teaching Jamie about MDI use on this visit?

- a) Refer to patient package insert.
 b) Observe patient-use first.
 c) Demonstrate to patient first.
 d) Let patient look at a video.
 e) Provide patient with written instructions.

16. Which measures would NOT be considered important for increasing adherence in this situation?

- a) Written information regarding asthma should be provided.
 b) A review of the patient's device technique should be done every 6 to 12 months.
 c) A written record of the drug names and dosages should be provided.
 d) The mother, rather than the boy, should be involved in the process of determining the "therapeutic plan".
 e) Follow-up to ensure that asthma symptoms are controlled.

CASE STUDY #3

Mr. Thompson and his 5-year-old daughter Laura approach you with a prescription for salbutamol and fluticasone. This is the first time that asthma medication has been prescribed for Laura.

17. Which asthma device could be considered for this age group?

- a) metered dose inhaler and spacer with face mask
 b) metered dose inhaler and spacer with mouth piece
 c) Turbuhaler
 d) Diskus
 e) All of the above

18. Which asthma device is the preferred device for this age group?

- a) metered dose inhaler and spacer with face mask
 b) metered dose inhaler and spacer with mouth piece
 c) Turbuhaler
 d) Diskus

19. Which statement is TRUE with respect to their likelihood to comply with their medication?

- a) The majority of asthma patients comply with their medication regimen if it is a simple one.
 b) Asthma education always results in improved adherence.
 c) There is a great need for patients to understand the role of using inhaled corticosteroids since it will help improve compliance.
 d) Pharmacists are the only health professionals who can have an impact on compliance.

20. Mr. Thompson indicates that he is concerned about his daughter using a steroid-type medication and is worried that it will stunt her growth. Which of the following is NOT a reasonable intervention at this time to encourage adherence to Laura's inhaled steroid medication in this situation?

- a) Suggest that Mr. Thompson purchase an electronic reminder device.
 b) Ensure that they understand that the final height is not affected by inhaled steroid use at recommended doses.
 c) Ensure that Laura can use her medication correctly.
 d) Recommend that they use a spacer device with their inhaled steroid medication.
 e) Ask if they would be agreeable to a follow-up call from you in a few weeks to discuss any issues that may have arisen.

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Feedback on this CE lesson

- Do you now feel better able to provide pharmaceutical care for patients with asthma? Yes No
- Was the information in this lesson relevant to your practice? Yes No
- Will you be able to incorporate the information from this lesson into your practice? Yes No
- Was the information in this lesson... Too basic Appropriate Too Difficult
- Do you feel this lesson met its stated learning objectives? Yes No
- What topic would you like to see covered in a future issue? _____

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