What do patients need to know about their asthma?

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INTRODUCTION — There are a number of publications that describe what patients need to know about their asthma [1-8]. Perhaps the most important and far-reaching document on what to include in an asthma education program has been "the National Asthma Education and Prevention Program: Expert Panel Report 3, Guidelines for the Diagnosis and Management of Asthma -- Full Report 2007" [1]. The full text is available at the website of the National Heart, Lung, and Blood Institute [1].

A comprehensive asthma education program covering all asthma education topics in depth may not be possible in all clinical settings. Based on a series of focus group interviews, the "core elements" necessary in an asthma education program have been identified [9,10]. The **three topics** of primary importance for patient education are the following:

- Function and appropriate use of medication
- Pathophysiology of asthma
- Issues in the prevention and treatment of symptoms

The National Asthma Education and Prevention Program (NAEPP) has emphasized that clinician care is necessary, but not sufficient to achieve asthma control. In addition, the patient must be taught to perform effective self-management [1]. The essentials of what patients need to know about their asthma will be reviewed here. An overview of asthma management and the techniques of using inhaler devices are discussed separately. (See "An overview of asthma management" and "The use of inhaler devices in adults" and "The use of inhaler devices in children".)

EFFECTIVENESS OF EDUCATION — There is ample evidence that asthma education results in a variety of patient- and society-important outcomes, including the following [11-23]:

- Improved quality of life
- Improvement in symptoms
- Fewer limitations in activity
- Improved medication adherence
- Fewer urgent care visits and hospitalizations
- Reduction in asthma-related costs

ESTABLISHING A PARTNERSHIP — The clinician should make efforts to establish open communication and a sense of shared responsibility by doing the following at every asthma visit:

- Involve the patient and family in decision making
- Encourage the patient and family in their self-management efforts
- Ask openly about patient preferences and goals and incorporate these into treatment when possible

- Enquire about patient and family concerns and fears about chronic illness, medication use, dependency, and cost

ASTHMA ACTION PLANS — An "asthma action plan" is a written document that provides instructions for the patient to follow at home. It should include directions about daily self-assessment and baseline medications, as well as a plan for managing exacerbations, including peak expiratory flow (PEF) levels and symptoms for which acute care is needed (form 1 and form 2 and algorithm 1) [1]. The action plan should be simple and formatted for ease of reading and the possibility that a patient's literacy level is low [24]. (See "Literacy and patient care".)

The plan should be individualized during initial visits in consultation with the patient [25]. During a patient's first visit, information regarding medications, treatment goals, how following the plan will help the patient reach these goals, and when to seek urgent care can be incorporated into the plan.

For those patients who have or will be provided with a peak flow meter, the concepts of personal best peak flow rate and how this measurement is used should be discussed. The patient should receive a chart to record peak flow rates. At a subsequent visit, the patient's personal best peak flow can be added to the plan. Specific instructions for creating an individualized asthma action plan, as well as the needed charts for recording peak flows, are reviewed separately. (See "Peak expiratory flow rate monitoring in asthma".)

The plan should be reviewed and refined at subsequent follow-up visits. Emphasizing the patient's personal goals is essential to enhancing adherence. For example, ask, "Have you had any problems taking your bronchodilator immediately before playing basketball? Has it helped you stay in the game?". Question the patient about any aspects of the plan that were confusing or unhelpful.

A written action plan is especially important for patients with moderate-to-severe persistent asthma and patients with a history of severe exacerbations.

Daily asthma care — Patients may monitor the status of their asthma based upon symptoms alone, or by additionally monitoring daily peak flow readings. Peak flow monitoring has not been shown to be superior to symptom-based monitoring, so either approach or a combined approach is acceptable.

The plan should stipulate the patient's daily medications, including doses and frequencies. When patients are instructed to use inhaled medicines "as needed", the maximum number of "puffs" per day should be specifically stated.

Attack management — Patients should understand how to recognize early symptoms and begin therapy [26]. They should understand the signs that are indications for emergency care and they should be encouraged to stay calm during severe exacerbations.

Detecting symptoms and initiating treatment — Stress the importance of recognizing and immediately treating early warning signs and symptoms. These include a drop in peak expiratory flow rate, an increase in asthma symptoms, or other individual patterns related to shortness of breath or tightness in the chest. Give patients written instructions about when to take extra doses of quick-acting reliever medications and when to initiate a course of oral glucocorticoids [1,26]. Recommend that patients try to rest and maintain adequate hydration during periods of increased symptoms [3].

Indications for emergency care — Describe signs that require immediate emergency medical attention, such as cyanosis, failure of medications to control symptoms, or a significant drop in peak flow rate. Stress the importance of understanding the difference between attacks they can manage on their own and those that require a patient to seek medical attention without delay. Emphasize the benefits of staying calm during a severe exacerbation.

The asthma action plan should include emergency telephone numbers for the clinician, emergency department, rapid transportation, and family/friends for aid and support.

PATIENT EDUCATION — Important self-management knowledge and skills can be categorized into four broad areas

[3]:

- Understanding asthma
- Attack management
- Attack prevention
- Communication

The table shows the patient education topics outlined by the NAEPP (table 1).

Understanding asthma — The patient and family should understand the characteristics of asthma, the principles of effective treatment, the effects of various medications, and the resources available. It is recommended that the clinician provide information in the following manner (table 2):

What is asthma? — Explain the three characteristics of asthma:

- Airway inflammation
- Increased airway sensitivity to a number of triggers
- Temporary airflow obstruction leading to breathing difficulty

Characteristic airway changes — Describe the principal variations in airways that cause an asthma exacerbation: inflammation, bronchospasm, and excess mucus; and explain how different medications target these causes.

Treatment — Review the five principles of effective asthma treatment:

- The need for individualized, continuing care
- The way medications work to prevent and/or relieve symptoms
- Medication side effects and how to manage them
- Preventive treatment to reduce inflammation when symptoms are not present
- Early treatment of symptoms when present

Patient fears concerning medication — Discuss and try to alleviate patients' fears about medication. These are generally related to such concerns as long-term adverse effects, toxicity, addiction, and tolerance.

Proper health care resource utilization — Discuss when it is appropriate to call or visit the clinic, as opposed to the emergency department.

Attack prevention — Important issues include understanding the use of medications, avoidance of triggers, proper inhalation technique, the role of monitoring, and the use of premedication in specific situations.

Signs and symptoms of asthma — Instruct how to recognize all possible symptoms of a potential asthma episode, such as shortness of breath, wheezing, chest tightness, and recurrent coughing. Explain how using a peak flow meter can help detect changes before symptoms are present. (See "Peak expiratory flow rate monitoring in asthma" and "Patient information: How to use a peak flow meter (Beyond the Basics)".)

Role of medications — Describe differences in bronchodilators and antiinflammatory medications and the proper use of each. (See "An overview of asthma management".)

Factors that make asthma worse — Explain how to identify, avoid, eliminate, or control asthma "triggers". Stress that treatment measures without environmental control are ineffective. (See "Trigger control to enhance asthma management" and "Patient information: Trigger avoidance in asthma (Beyond the Basics)".)

Correct inhaler use — Provide skills training in using each type of inhaler prescribed (picture 1 and picture 2 and table 3 and table 4 and table 5). Also discuss spacer devices (picture 3) and nebulizers if used. (See "The use of inhaler

devices in adults" and "The use of inhaler devices in children" and "Patient information: Asthma inhaler techniques in adults (Beyond the Basics)" and "Patient information: Asthma inhaler techniques in children (Beyond the Basics)" and "Delivery of inhaled medication in adults", section on 'Nebulizers'.)

Monitoring — Describe the advantages of keeping diaries of medication use, peak flow rates, environmental exposures, symptoms, and actions taken. These data provide a valuable resource to both the clinician and patient in planning attack prevention and management strategies. (See "Peak expiratory flow rate monitoring in asthma" and "Patient information: How to use a peak flow meter (Beyond the Basics)".)

Premedicating to prevent onset of symptoms — Tell patients what medication measures to take when triggers cannot be avoided. For example, premedication with beta-agonist agents or cromolyn sodium prior to exercise or exposure to known allergens or irritants may prevent onset of symptoms. (See "The use of chromones (cromoglycates) in the treatment of asthma", section on 'Clinical use' and "Exercise-induced bronchoconstriction" and "Patient information: Exercise-induced asthma (Beyond the Basics)".)

Evaluation of results of treatment plan — Periodic clinical evaluation is necessary to assess adherence to the management plan and status of therapy goals. Discuss areas where desired outcomes are not being achieved, and change the therapy as necessary.

Communication — Alleviating fears and misconceptions, encouraging family understanding and support, and developing open communication among the patient, the school, the family, and the health care team are critical to optimal management and attainment of as normal a lifestyle as possible.

Fears and misconceptions — Identify and help alleviate patient and family fears and misconceptions about asthma. They may need to be told that asthma is not caused by psychological factors; most asthma fatalities are due to under-treatment; asthma does not have to limit physical activity; and asthma does not necessarily lead to lung disability.

Family support — Encourage patients to inform family members, friends, and co-workers about their asthma, at least to the extent that help can be provided if needed.

Feelings about asthma — Patients may have difficulty accepting that they have a chronic condition that can be treated but not cured. Help patients acknowledge and openly discuss their feelings, and take responsibility for managing their asthma.

Communication with the health care team — Stress that patient input into the treatment plan is essential, and that open, honest communication among those involved will ensure better asthma management.

Communication with the child's school — Encourage parents to inform relevant school personnel about regular and emergency care procedures. Use of a school action plan is advised (student asthma action plan).

Health promotion behaviors — Encourage patients to practice general preventive health practices that can affect physical and mental health [5].

INCORPORATING ASTHMA EDUCATION INTO PATIENT VISITS — It can be challenging to incorporate patient-focused asthma education into patient care visits. To help individualize asthma education, the authors have developed a short questionnaire that is useful in determining a patient's strengths and weaknesses in asthma self-management knowledge and skills [27]. This instrument is provided in the figure (table 6). By using an instrument like this, busy clinicians can identify the most important points to discuss with each patient. The National Asthma Education and Prevention Program Expert Panel also has developed a strategy for building self-management education into patient care visits. This plan is provided in the figure (table 7A-D) [1].

INFORMATION FOR PATIENTS — UpToDate offers two types of patient education materials, "The Basics" and "Beyond

the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "Patient information: Asthma in adults (The Basics)" and "Patient information: Asthma in children (The Basics)" and "Patient information: How to use your metered dose inhaler (adults) (The Basics)" and "Patient information: How to use your dry powder inhaler (adults) (The Basics)" and "Patient information: Avoiding asthma triggers (The Basics)" and "Patient information: Medicines for asthma (The Basics)")
- Beyond the Basics topics (see "Patient information: Asthma inhaler techniques in adults (Beyond the Basics)" and "Patient information: Asthma treatment in adolescents and adults (Beyond the Basics)" and "Patient information: Trigger avoidance in asthma (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- The **three topics** of primary importance for patient education are the function and appropriate use of medication, the pathophysiology of asthma, and the prevention and treatment of symptoms. A comprehensive list of asthma education topics outlined by the National Asthma Education and Prevention Program is provided in the table (table 1). (See 'Introduction' above.)
- The three characteristics of asthma for patients and families to understand are that airways inflammation, sensitivity to triggers, and the temporary occurrence of airflow obstruction leading to shortness of breath are all components of asthma. Understanding these characteristics provides the foundation for an understanding of asthma medications and trigger avoidance. (See 'What is asthma?' above.)
- An "asthma action plan" is developed based on the collaboration between the patient (and family) and asthma care provider and includes information and guidance on routine daily care and management of exacerbations. Examples of action plans are provided in the figures (form 1 and form 2). A school asthma action plan is also useful (student asthma action plan). A written action plan is especially important for patients with moderate-to-severe persistent asthma and patients with a history of severe exacerbations. (See 'Asthma action plans' above.)
- Inhaled medications are a key component of asthma management and correct inhaler use is essential. Patients and their families need clear instructions and demonstration of the correct use of each type of inhaler and spacer or chamber device prescribed (figure 1 and picture 3 and picture 2 and table 8 and table 9 and table 10 and table 4 and table 5). (See 'Correct inhaler use' above and "The use of inhaler devices in adults" and "The use of inhaler devices in children" and "Patient information: Asthma inhaler techniques in adults (Beyond the Basics)" and "Patient information: Asthma inhaler techniques in children (Beyond the Basics)".)
- Asthma education also includes instruction on recognizing the various symptoms of a potential asthma episode, such as shortness of breath, wheezing, chest tightness, and coughing. (See 'Signs and symptoms of asthma' above.)
- Explaining how to use a peak flow meter can help patients detect changes in airflow before symptoms are present and obtain objective confirmation of changes in airflow when symptoms develop. (See 'Monitoring' above and "Peak expiratory flow rate monitoring in asthma" and "Patient information: How to use a peak flow meter (Beyond the Basics)".)

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Topic 566 Version 17.0

GRAPHICS

Asthma action plan

My Asthma Action Plan

Age ≥5 years

Patient Name: _____

Medical Record #: _____

Clinician's Name: _____ DOB: _____

Clinician's Phone #: _____ Completed by: _____ Date: _____

Long-Term Control Medicines	How Much To Take	How Often	Other Instructions
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
Quick-Relief Medicines	**How Much To Take**	**How Often**	**Other Instructions**
		Take ONLY as needed	NOTE: If this medicine is needed frequently, call clinician to consider increasing long-term control medications.

Special instructions when I feel ● *good*, ○ *not good*, and ● *awful*.

GREEN ZONE

I feel *good*.

{My peak flow is in the GREEN zone.}

My Personal Best Peak Flow

PREVENT asthma symptoms everyday:

- ☐ Take my long-term control medicines (above) every day.
- ☐ Before exercise, take _____ puffs of _____
- ☐ Avoid things that make my asthma worse like:

_____

YELLOW ZONE

I do *not* feel *good*.

{My peak flow is in the YELLOW zone.}

My symptoms may include one or more of the following:

- Wheeze
- Tight chest
- Cough
- Shortness of breath
- Waking up at night with asthma symptoms
- Decreased ability to do usual activities
- _____

_____

80% Personal Best

CAUTION. I should continue taking my long-term control asthma medicines every day AND:

- ☐ Take _____

_____

If I still do not feel good, or my peak flow is not back in the *Green Zone* within one hour, then I should:

- ☐ Increase _____

_____

- ☐ Add _____

_____

- ☐ Call _____

RED ZONE

I feel *awful*.

{My peak flow is in the RED zone.}

Warning signs may include one or more of the following:

- It is getting harder and harder to breathe
- Unable to sleep or do usual activities because of trouble breathing

50% Personal Best

Unable

Peak Flow Meter

MEDICAL ALERT! Get help!

- ☐ Take _____

until I get help immediately.

- ☐ Take _____

_____

- ☐ Call _____

Danger! Get help immediately! Call 9-1-1 if you have trouble walking or talking due to shortness of breath or lips or fingernails are gray or blue.

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Graphic 55900 Version 3.0

Child asthma action plan

Child Asthma Action Plan
0 to 5 years of age

Patient Name: _____

Medical Record #: _____

Healthcare Provider's Name: _____

DOB: _____

Healthcare Provider's Phone #: _____ Completed by: _____ Date: _____

Long-Term Control Medicines (Use Every Day To Stay Healthy)	How Much To Take	How Often	Other Instructions (such as spacers/masks, nebulizers)
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
Quick-Relief Medicines	**How Much To Take**	**How Often**	**Other Instructions**
		Give ONLY as needed	NOTE: If this medicine is needed often (_____ times per week), call clinician.

GREEN ZONE

Child is ***well*** and has no asthma symptoms, even during active play.

PREVENT asthma symptoms everyday:
- Give the above long-term control medicines every day.
- Avoid things that make the child's asthma worse:

☑ Avoid tobacco smoke; ask people to smoke outside.

☐ _____

☐ _____

YELLOW ZONE

Child is ***not well*** and has asthma symptoms that may include:
- Coughing
- Wheezing
- Runny nose or other cold symptoms
- Breathing harder or faster
- Awakening due to coughing or difficulty breathing
- Playing less than usual
- _____
- _____

Other symptoms that could indicate that your child is having trouble breathing may include: difficulty feeding (grunting sounds, poor sucking), changes in sleep patterns, cranky and tired, decreased appetite.

CAUTION. Take action by continuing to give regular asthma medicines every day AND:

☐ Give _____

_____ (include dose and frequency)

If the child is not in the *Green Zone* and still has symptoms after one hour then:

☐ Give more _____

_____ (include dose and frequency)

☐ _____

_____ (include dose and frequency)

☐ Call _____

RED ZONE

Child ***feels awful!*** Warning signs may include:
- Child's wheeze, cough, or difficulty breathing continues or worsens, even after giving yellow zone medicines.
- Child's breathing is so hard that he/she is having trouble walking/talking/eating/playing.
- Child is drowsy or less alert than normal.

Danger! Get help immediately!

MEDICAL ALERT! Get help!

☐ Take the child to the hospital or call 9-1-1 immediately!

☐ Give more _____ until you get help. (include dose and frequency)

☐ Give _____ (include dose and frequency)

Call 9-1-1 if:
- The child's skin is sucked in around neck and ribs, or
- Lips and/or fingernails are gray or blue, or
- Child does not respond to you.

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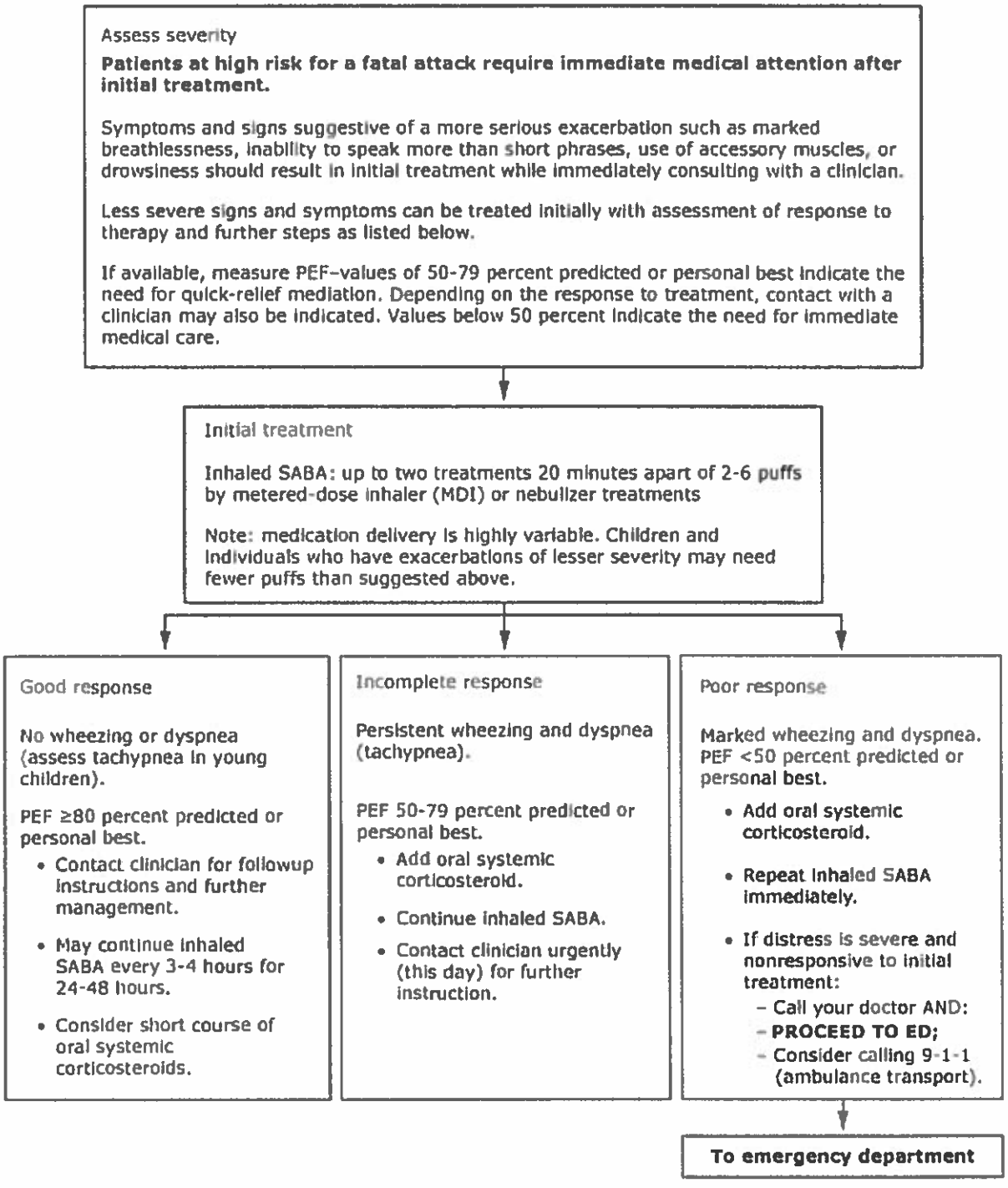
Graphic 71958 Version 3.0

Management of asthma exacerbations: home treatment



ED: emergency department; MDI: metered-dose inhaler; PEF: peak expiratory flow; SABA: short-acting beta$_2$-agonist (quick-relief inhaler).

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Graphic 56621 Version 3.0

National Asthma Education and Prevention Program guidelines for the diagnosis and management of asthma: The content of patient teaching

Definition of asthma
Key points about signs and symptoms of asthma
Characteristic changes in the airways of asthma patients and the role of medication
Asthma triggers and how to avoid or control them
Treatment
Patient fears concerning medication
Use of written guidelines
Use of written diaries
Correct us of inhalers
Criteria for premedicating to prevent onset of symptoms
Optimal use of home peak expiratory flow rate monitoring
Evaluation of results of treatment plan
Fears and misconceptions
Family understanding and support
Communication with the child's school (by parents and clinician)
Feelings about asthma

Graphic 61244 Version 1.0

Delivery of asthma education by clinicians during patient care visits

Assessment questions	Information	Skills
Recommendations for initial visit		
Focus on:	**Teach in simple language:**	**Teach or review and demonstrate:**
• Expectations of visit	• What is asthma? Asthma is a chronic lung disease. The airways are very sensitive. They become inflamed and narrow; breathing becomes difficult.	• Inhaler and spacer or valved holding chamber (VHC) use. Check performance.
• Asthma control	• The definition of asthma control: few daytime symptoms, no nighttime awakenings due to asthma, able to engage in normal activities, normal lung function.	• Self-monitoring skills that are tied to a written action plan:
• Patients' goals of treatment	• Asthma treatments: two types of medicines are needed:	- Recognize intensity and frequency of asthma symptoms.
• Medications	- Long-term control: medications that prevent symptoms, often by reducing inflammation.	- Review the signs of deterioration and the need to reevaluate therapy:
• Quality of life	- Quick relief: short-acting bronchodilator relaxes muscles around airways.	Waking at night or early morning with asthma
"What worries you most about your asthma?"	• Bring all medications to every appointment.	Increased medication use
"What do you want to accomplish at this visit?"	• When to seek medical advice. Provide appropriate telephone number.	Decreased activity tolerance
"What do you want to be able to do that you can't do now because of your asthma?"		• Use of a written asthma action plan that includes instructions for daily management and for recognizing and handling worsening asthma.
"What do you expect from treatment?"		
"What medicines		

have you tried?"		
"What other questions do you have for me today?"		
"Are there things in your environment that make your asthma worse?"		

Recommendations for first followup visit (2 to 4 weeks or sooner as needed)

Focus on:	**Teach in simple language:**	**Teach or review and demonstrate:**
• Expectations of visit	• Use of two types of medications.	• Use of written asthma action plan. Review and adjust as needed.
• Asthma control	• Remind patient to bring all medications and the peak flow meter, if using, to every appointment for review.	• Peak flow monitoring if indicated.
• Patients' goals of treatment	• Self-assessment of asthma control using symptoms and/or peak flow as a guide.	• Correct inhaler and spacer or VHC technique.
• Medications		
• Patient treatment preferences		
• Quality of life		
Ask relevant questions from previous visit and also ask:		
"What medications are you taking?"		
"How and when are you taking them?"		
"What problems have you had using your medications?"		
"Please show me how you use your inhaled medications."		

Recommendations for second followup visit

Focus on:	Teach in simple language:	Teach or review and demonstrate:
• Expectations of visit	• Self-assessment of asthma control, using symptoms and/or peak flow as a guide.	• Inhaler/spacer or VHC technique.
• Asthma control	• Relevant environmental control/avoidance strategies:	• Peak flow monitoring technique.
• Patients' goals of treatment	- How to identify home, work, or school exposures that can cause or worsen asthma	• Use of written asthma action plan. Review and adjust as needed.
• Medications	- How to control house-dust mites, animal exposures if applicable	• Confirm that patient knows what to do if asthma gets worse.
• Quality of life	- How to avoid cigarette smoke (active and passive)	
Ask relevant questions from previous visits and also ask:	• Review all medications.	
"Have you noticed anything in your home, work, or school that makes your asthma worse?"		
"Describe for me how you know when to call your doctor or go to the hospital for asthma care."		
"What questions do you have about the asthma action plan?" "Can we make it easier?"		
"Are your medications causing you any problems?"		
"Have you noticed anything in your environment that makes your asthma worse?"		

"Have you missed any of your medications?"		
Recommendations for all subsequent visits		
Focus on:	**Teach in simple language:**	**Teach or review and demonstrate:**
• Expectations of visit	• Review and reinforce all:	• Inhaler/spacer or VHC technique.
• Asthma control	- Educational messages	• Peak flow monitoring technique, if appropriate.
• Patients' goals of treatment	- Environmental control strategies at home, work, or school	• Use of written asthma action plan. Review and adjust as needed.
• Medications	- Medications	• Confirm that patient knows what to do if asthma gets worse.
• Quality of life	- Self-assessment of asthma control, using symptoms and/or peak flow as a guide	
Ask relevant questions from previous visits and also ask:		
"How have you tried to control things that make your asthma worse?"		
"Please show me how you use your inhaled medication."		

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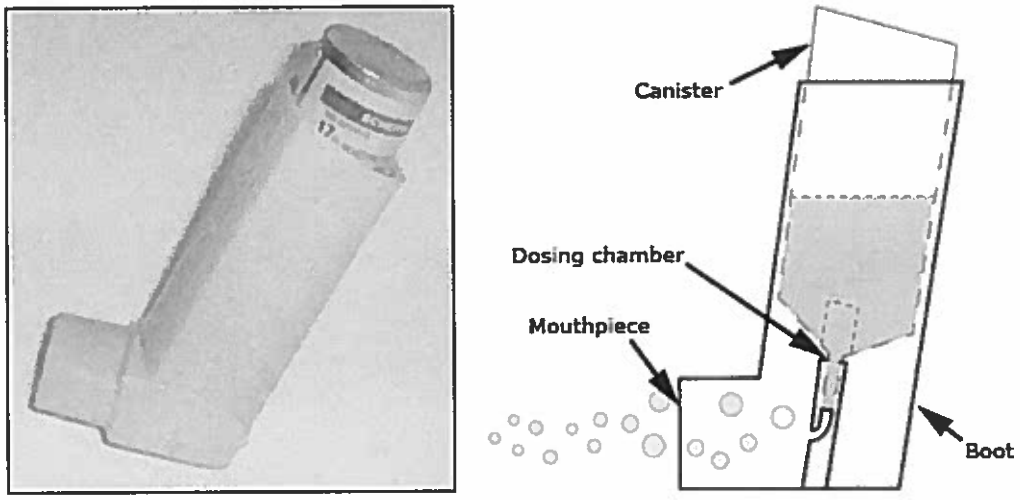
Graphic 82191 Version 1.0

Metered dose inhaler

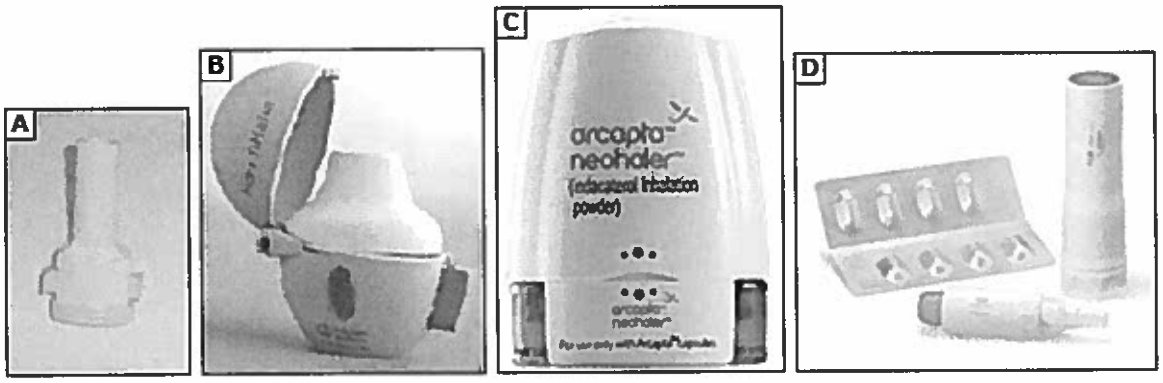


Medication is stored under pressure in the canister and released from the dosing chamber when the cannister is pressed downward.

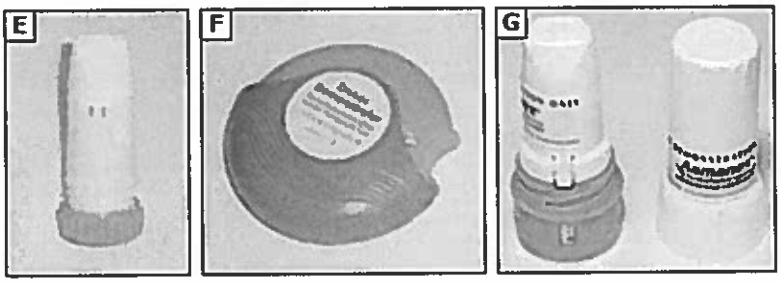
Graphic 62613 Version 3.0

Examples of various dry powder inhalers

Single-dose devices



Multiple-dose devices



With these devices, the patient inhales the medication in the form of a fine powder rather than an aerosol. (A) Aerolizer, (B) HandiHaler, (C) Neohaler, (D) Tobi Podhaler, (E) Flexhaler, (F) Diskus, (G) Twisthaler. With single-dose devices, a powder-filled capsule is placed in the device for each dose. With multiple-dose devices, medication for multiple doses (often a month's supply) is contained within the device.

Graphic 57922 Version 5.0

Technique for use of various dry powder inhalers

Aerolizer
Remove cover and hold the base of inhaler.
Twist mouthpiece in counter-clockwise direction.
Remove capsule from foil blister immediately before use and place capsule in the base of the inhaler.
Hold the base of the inhaler and turn clockwise to close.
Simultaneously press both buttons once to pierce the capsule.
Exhale normally - do not exhale into the mouthpiece.
Tilt head back slightly, hold device horizontal with the buttons on the left and right, place mouthpiece into the mouth, and close lips around mouthpiece.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device.
Open chamber and examine capsule; if powder remains, repeat inhalation process.
After use, remove and discard capsule, and cover mouthpiece; store device in cool, dry place.
Diskhaler
Remove mouthpiece cover and pull tray out from device.
Place disk on wheel with numbers facing up.
Rotate disk by sliding tray out and in.
Lift back of lid until fully upright so that needle pierces both sides of blister.
Keep device level while inhaling dose with a rapid and steady flow.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device.
Brush off any powder remaining within device once every week; store device in cool, dry place.
Diskus
Open the device and slide the lever until it clicks.
Keep device level while inhaling dose.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device; store device in cool, dry place.
HandiHaler
Capsules should be stored in sealed blisters and only removed immediately before use.
Peel back the foil using the tab until one capsule is fully visible.
Open the dust cap by pulling it upwards, then open the mouthpiece.

Place the capsule in the center chamber (it does not matter which end of the capsule is placed in the chamber).
Close the mouthpiece firmly until you hear a click, leaving the dust cap open.
Hold the HandiHaler with the mouthpiece upwards and press the piercing button completely in once and release.
Breathe out completely. Do not breathe into the mouthpiece at any time.
Close your lips tightly around the mouthpiece.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
To ensure you get the full dose, repeat the inhalation from the HandiHaler as described.
After the dose, open the mouthpiece, tip out the used capsule, and dispose. Do not handle used capsules.
Close the mouthpiece and dust cap for storage; store device in cool, dry place.
Turbuhaler
Twist and remove cover.
Hold inhaler upright with mouthpiece facing up.
Turn grip right then left until it clicks.
Inhaler may be held upright or horizontal.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device.
Replace cover and twist to close; store device in cool, dry place.
Twisthaler
Hold the inhaler straight up with the pink portion (the base) on the bottom.
Remove the cap while it is in the upright position to make sure you get the right amount of medicine with each dose.
Hold the pink base and twist the cap in a counter-clockwise direction to remove it.
As you lift off the cap, the dose counter on the base will count down by one. This action loads the medicine that you are now ready to inhale.
Make sure the indented arrow located on the white portion (directly above the pink base) is pointing to the dose counter.
Breathe out normally - do not exhale into the device.
Place the mouthpiece into your mouth, with the mouthpiece facing towards you, and close your lips tightly around it.
Inhale dose with a rapid and steady flow while holding the Twisthaler horizontal.
Remove the mouthpiece from your mouth and hold your breath for 5 to 10 seconds (or as long as you comfortably can).
When you exhale, be sure that you are not exhaling into the device.

Immediately replace the cap and turn in a clockwise direction as you gently press down until you hear a click.
Firmly close the Twisthaler to assure that your next dose is properly loaded.
Be sure that the arrow is in line with the dose-counter window.
Store device in cool dry place.
The dose counter displays the number of doses remaining. When the unit reads 01, this indicates the last remaining dose. When the counter reads 00, the unit must then be discarded.

Graphic 51020 Version 2.0

Technique for use of a metered dose inhaler (MDI) without a spacer or chamber

Prime your inhaler if this is the first time you are using it, if you have not used it for several days, or if you have dropped it. Priming a metered dose inhaler usually involves shaking it and spraying it into the air (away from your face) a total of up to 4 times. See the information that came with your inhaler for exact instructions.
Shake MDI canister vigorously for 5 seconds.
Hold the MDI upright with your index finger on the top of the medication canister and your thumb supporting the bottom of the inhaler.
Breathe out normally.
Put the mouthpiece between your teeth and close your lips around mouthpiece or position mouthpiece about 4 cm (about width of 2 fingers) from your mouth.
Keep your tongue away from the opening of the mouthpiece.
Press down the top of the canister with the index finger to release the medication.
At the same time as the canister is pressed, breathe in deeply and slowly through your mouth until your lungs are completely filled; this should take 4 to 6 seconds.
Hold the medication in your lungs for about 5 seconds before breathing out.
If you need a second puff, wait about 15 to 30 seconds between puffs. Shake canister again before the next puff.
When finished, recap mouthpiece.
If your inhaler contains a steroid medicine (sometimes called glucocorticoid or corticosteroid), rinse your mouth and gargle with water after you use it. Then spit out the water. Do not swallow it.

These instructions do NOT apply to dry powder or soft mist inhalers. Cleaning instructions are provided separately.
More detailed information about individual medication formulations can be found at http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm.

Graphic 72362 Version 6.0

Technique for use of a metered dose inhaler (MDI) with a spacer or chamber*

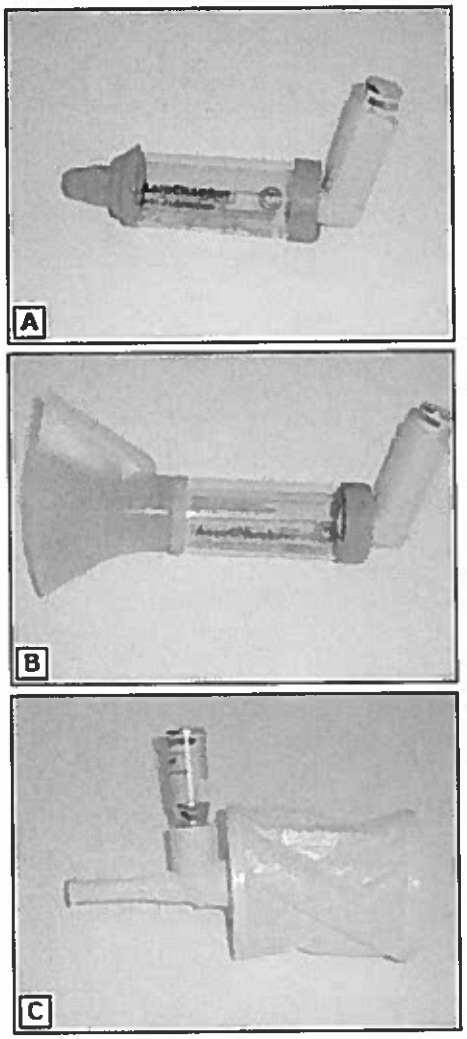
Uncap mouthpiece and check for loose objects in the device.
Prime your inhaler if this is the first time you are using it, if you have not used it for several days, or if you have dropped it. Priming a metered dose inhaler usually involves shaking it and spraying it into the air (away from your face) a total of up to 4 times. See the information that came with your inhaler for exact instructions.
Insert MDI into spacer.
Shake canister vigorously for about 5 seconds.
Hold the MDI upright with your index finger on the top of the medication canister and your thumb supporting the bottom of the inhaler. You may need to use the other hand to hold the spacer.
Breathe out normally through your mouth.
Put the mouthpiece between your teeth and close your lips tightly around mouthpiece of spacer, or, if using a mask attached to the chamber, place the mask completely over your nose and mouth.
Keep your tongue away from opening of spacer.
Press down the top of the canister with your index finger to release the medicine.
At the same time, breathe in deeply and slowly through your mouth until your lungs are completely filled; this should take 3 to 5 seconds.
Hold the medicine in your lungs for about 5 seconds. If you didn't get a full breath or can't hold your breath long enough, you can inhale a second time to fully empty the chamber, and hold your breath again for about 5 seconds.
If you need more than 1 puff, wait about 15 to 30 seconds between puffs. Shake canister again before the next puff. Do **not** load both puffs into the chamber and then empty the chamber with a single inhalation.
When finished, recap mouthpiece.
If your inhaler contains a steroid medicine (sometimes called glucocorticoid or corticosteroid), rinse your mouth and gargle with water after you use it. Then spit out the water. Do not swallow it.
You can use your spacer for more than one medication. Just remove the first MDI and insert the other one.

These instructions do NOT apply to dry powder or soft mist inhalers. Cleaning instructions are provided separately.

* We prefer to use a "valved holding chamber" for the spacer. The valve holds the medicine in the chamber. When you breathe out into the mouthpiece, your breath goes into the room and not into the chamber. This helps get the medicine into your lungs.

Graphic 93619 Version 2.0

Spacers used with metered dose inhalers



(A) AeroChamber, (B) AeroChamber with mask, and (C) InspirEase. These devices can make it easier to use a metered dose inhaler and decrease the amount of drug that lands in the mouth and throat.

Graphic 58957 Version 4.0

Individual patient needs survey*

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I know what asthma is and can recognize the signs and symptoms of asthma.	1	2	3	4	5
I understand how each of my asthma medications works to improve my condition.	1	2	3	4	5
I know what my asthma "triggers" are and how I can avoid them or reduce exposure to them.	1	2	3	4	5
I am confident I can prevent asthma symptoms from occurring in most situations.	1	2	3	4	5
I am confident I can manage asthma symptoms when they occur.	1	2	3	4	5
I know how to monitor my airways with a peak flow meter to detect potential asthma episodes before they occur.	1	2	3	4	5
Having asthma does not prevent me from doing activities that I would do if I did not have it.	1	2	3	4	5
People around me (family, friends, co-workers, school personnel) are familiar with my asthma self-management plan.	1	2	3	4	5

* As used by the author and his staff.

Graphic 81460 Version 1.0

Delivery of asthma education by clinicians during patient care visits: recommendations for initial visit

Assessment questions	Information	Skills
Focus on:	**Teach in simple language:**	**Teach and demonstrate:**
Concerns	What is asthma?	Inhaler and spacer/holding chamber use. Check performance.
Quality of life	A chronic lung disease. The airways are very sensitive. They become inflamed and narrow; breathing becomes difficult.	Self-monitoring skills that are tied to an action plan:
Expectations	Asthma treatments: two types of medicines are needed:	Recognize intensity and frequency of asthma symptoms
Goals of treatment	Long-term control: medications that prevent symptoms, often by reducing inflammation	Review the signs of deterioration and the need to reevaluate therapy:
Ask relevant questions from previous visit and also ask:	Quick relief: short-acting bronchodilator relaxes muscles around airways	Waking at night with asthma
"What worries you most about your asthma?"	Bring all medications to every appointment.	Increased medication use
"What do you want to accomplish at this visit?"	When to seek medical advice. Provide appropriate telephone number.	Decreased activity tolerance
"What do you want to be able to do that you can't do now because of your asthma?"		Use of a simple, written self-management plan
"What do you expect from treatment?"		
"What medications have you tried?"		
"What other questions do you have for me today?"		

Graphic 56749 Version 1.0

Delivery of asthma education by clinicians during patient care visits: recommendations for first followup visit (two to four weeks or sooner as needed)

Assessment questions	Information	Skills
Focus on:	**Teach or review in simple language:**	**Teach or review and demonstrate:**
Concerns	Use two types of medications. Remind patient to bring all medications and the peak flow meter to every appointment for review.	Use of a daily self-management plan. Review and adjust as needed.
Quality of life	Self-evaluation of progress in asthma control using symptoms and peak flow as a guide.	Use of an action plan. Review and adjust as needed.
Expectations		Peak flow monitoring and daily diary recording.
Goals of treatment		Correct inhaler and spacer/holding chamber technique.
Ask relevant questions from previous visit and also ask:		
"What medications are you taking?"		
"How and when are you taking them?"		
"What problems have you had using your medications?"		
"Please show me how you use your inhaled medications?"		

Graphic 63828 Version 1.0

Delivery of asthma education by clinicians during patient care visits: recommendations for second followup visit

Assessment questions	Information	Skills
Focus on:	**Teach or review in simple language:**	**Teach or review and demonstrate:**
Expectations of visit	Relevant environmental control/avoidance strategies:	Inhaler/spacer/holding chamber technique.
Goals of treatment	How to identify home, work, or school exposures that can cause or worsen asthma	Peak flow monitoring technique.
Medications	How to control house-dust mites, animal exposure if applicable	Use of daily self-management plan. Review and adjust as needed.
Quality of life	How to avoid cigarette smoke (active and passive)	Review use of action plan. Confirm that patient knows what to do if asthma gets worse.
Ask relevant questions from previous visit and also ask:	Review all medications.	
"Have you noticed anything in your home, work, or school that makes your asthma worse?"	Review and interpret from daily diary:	
"Describe for me how you know when to call your doctor or go to the hospital for asthma care."	Peak flow measures	
"What questions do you have about the action plan?" "Can we make it easier?"	Symptom scores	
"Are your medications causing you any problems?"		

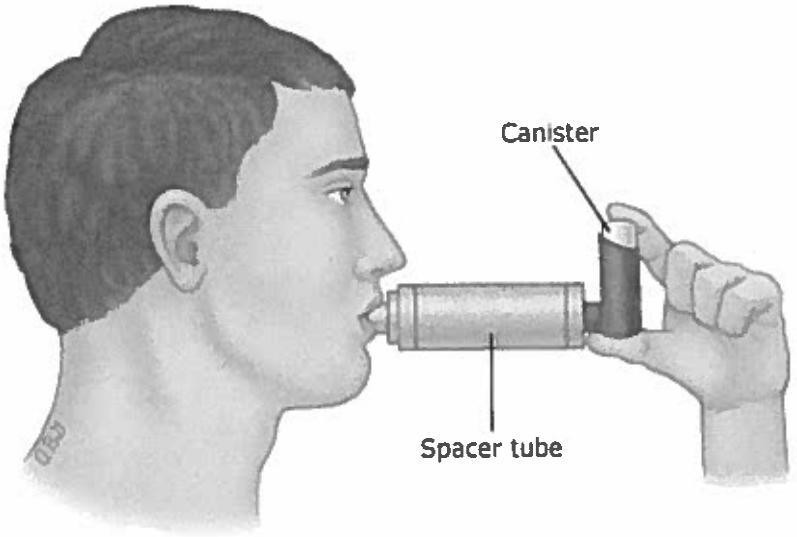
Graphic 75688 Version 1.0

Delivery of asthma education by clinicians during patient care visits: recommendations for all subsequent visits

Assessment questions	Information	Skills
Focus on:	**Teach or review in simple language:**	**Teach or review and demonstrate:**
Expectations of visit	Review and reinforce all:	Inhaler/spacer/holding chamber techique.
Goals of treatment	Educational messages	Peak flow monitoring technique.
Medications	Environmental control strategeis at home, work, or school	Use of daily self-management plan. Review and adjust as needed.
Quality of life	Medications	Review use of action plan. Confirm that patient knows what to do if asthma gets worse. Periodically review and adjust written action plan.
Ask relevant questions from previous visit and also ask:	Review and interpret from daily diary:	
"How have you tried to control things that make your asthma worse?"	Peak flow measures	
"Please show me how you use your inhaled medication."	Symptom scores	

Graphic 64430 Version 1.0

Use of metered dose inhaler



The patient holds the MDI between the thumb and index finger and closes his mouth around the spacer's mouthpiece.

Graphic 72731 Version 2.0

Technique for use of various dry powder inhalers - I

Aerolizer
Remove cover and hold the base of inhaler.
Twist mouthpiece in counter-clockwise direction.
Remove capsule from foil blister immediately before use and place capsule in the base of the inhaler.
Hold the base of the inhaler and turn clockwise to close.
Simultaneously press both buttons once to pierce the capsule.
Exhale normally - do not exhale into the mouthpiece.
Tilt head back slightly, hold device horizontal with the buttons on the left and right, place mouthpiece into the mouth, and close lips around mouthpiece.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device.
Open chamber and examine capsule; if powder remains, repeat inhalation process.
After use, remove and discard capsule, and cover mouthpiece; store device in cool, dry place.
Diskhaler
Remove mouthpiece cover and pull tray out from device.
Place disk on wheel with numbers facing up.
Rotate disk by sliding tray out and in.
Lift back of lid until fully upright so that needle pierces both sides of blister.
Keep device level while inhaling dose with a rapid and steady flow.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device.
Brush off any powder remaining within device once every week; store device in cool, dry place.
Diskus
Open the device and slide the lever until it clicks.
Keep device level while inhaling dose.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device; store device in cool, dry place.

Graphic 69703 Version 1.0

Technique for use of various dry powder inhalers - II

HandiHaler
Capsules should be stored in sealed blisters and only removed immediately before use.
Peel back the foil using the tab until one capsule is fully visible.
Open the dust cap by pulling it upwards, then open the mouthpiece.
Place the capsule in the center chamber (it does not matter which end of the capsule is placed in the chamber).
Close the mouthpiece firmly until you hear a click, leaving the dust cap open.
Hold the HandiHaler with the mouthpiece upwards and press the piercing button completely in once and release.
Breathe out completely. Do not breathe into the mouthpiece at any time.
Close your lips tightly around the mouthpiece.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
To ensure you get the full dose, repeat the inhalation from the HandiHaler as described.
After the dose, open the mouthpiece, tip out the used capsule, and dispose. Do not handle used capsules.
Close the mouthpiece and dust cap for storage; store device in cool, dry place.
Turbuhaler
Twist and remove cover.
Hold inhaler upright with mouthpiece facing up.
Turn grip right then left until it clicks.
Inhaler may be held upright or horizontal.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device.
Replace cover and twist to close; store device in cool, dry place.
Twisthaler
Hold the inhaler straight up with the pink portion (the base) on the bottom.
Remove the cap while it is in the upright position to make sure you get the right amount of medicine with each dose.
Hold the pink base and twist the cap in a counter-clockwise direction to remove it.
As you lift off the cap, the dose counter on the base will count down by 1. This action loads the medicine that you are now ready to inhale.
Make sure the indented arrow located on the white portion (directly above the pink base) is pointing to the dose counter.

Breathe out normally - do not exhale into the device.
Place the mouthpiece into your mouth, with the mouthpiece facing towards you, and close your lips tightly around it.
Inhale dose with a rapid and steady flow while holding the Twisthaler horizontal.
Remove the mouthpiece from your mouth and hold your breath for 5 to 10 seconds (or as long as you comfortably can).
When you exhale, be sure that you are not exhaling into the device
Immediately replace the cap and turn in a clockwise direction as you gently press down until you hear a click.
Firmly close the Twisthaler to assure that your next dose is properly loaded.
Be sure that the arrow is in line with the dose-counter window.
Store device in cool dry place.
The dose counter displays the number of doses remaining. When the unit reads 01, this indicates the last remaining dose. When the counter reads 00, the unit must then be discarded.

Graphic 80125 Version 1.0

Techniques for use of various dry powder inhalers in children

Diskhaler
Remove mouthpiece cover and pull tray out from device.
Place disk on wheel with numbers facing up.
Rotate disk by sliding tray out and in.
Lift back of lid until fully upright so that needle pierces both sides of blister.
Keep device level while inhaling dose with a rapid and steady flow.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device.
Brush off any powder remaining within device once every week; store device in cool, dry place.
Diskus
Open the device and slide the lever until it clicks.
Keep device level while inhaling dose.
Breathe in rapidly and steadily, as deeply as possible; hold breath.
Remove device from mouth and exhale outside device; store device in cool, dry place.
Flexhaler
Prime the inhaler: This is done only with the initial dose. Holding the inhaler in the upright position, twist the brown grip as far as it will go in one direction, then twist it all the way back in the other direction. A click will be heard during one of the turns. This step should be repeated to complete the priming of the device.
Load a dose: Holding the inhaler in an upright position, twist the brown grip as far as it will go in one direction, then twist it all the way back in the other direction.
Inhale the dose: Turn away from the inhaler and breathe out. Then place the mouthpiece in your mouth, close your lips, and inhale deeply.
Twisthaler
Hold the inhaler straight up with the pink portion (the base) on the bottom.
Remove the cap while it is in the upright position to make sure you get the right amount of medicine with each dose.
Hold the pink base and twist the cap in a counter-clockwise direction to remove it.
As you lift off the cap, the dose counter on the base will count down by one. This action loads the medicine that you are now ready to inhale.
Make sure the indented arrow located on the white portion (directly above the pink base) is pointing to the dose counter.
Breathe out normally - do not exhale into the device.

Place the mouthpiece into your mouth, with the mouthpiece facing towards you, and close your lips tightly around it.
Inhale dose with a rapid and steady flow while holding the Twisthaler horizontal.
Remove the mouthpiece from your mouth and hold your breath for 5 to 10 seconds (or as long as you comfortably can).
When you exhale, be sure that you are not exhaling into the device.
Immediately replace the cap and turn in a clockwise direction as you gently press down until you hear a click.
Firmly close the Twisthaler to assure that your next dose is properly loaded.
Be sure that the arrow is in line with the dose-counter window.
Store device in cool dry place.
The dose counter displays the number of doses remaining. When the unit reads 01, this indicates the last remaining dose. When the counter reads 00, the unit must then be discarded.

Graphic 58951 Version 5.0

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