

# Inhaler technique for people with asthma or COPD

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## KEY POINTS



- All patients need individualised, repeated hands-on training in correct inhaler use.
- Most patients with asthma or COPD do not use their inhalers properly, and most have not had their technique checked or corrected by a health professional.
- Incorrect inhaler technique increases the risk of severe flare-ups and hospitalisation for people with asthma or COPD.
- Poor asthma symptom control is often due to incorrect inhaler technique.
- Checking inhaler technique can improve asthma management.
- Inhaler technique should always be checked before considering dose escalation or add-on therapy.
- Incorrect inhaler technique increases the risk of side effects like dysphonia and oral thrush.
- The steps for using an inhaler device correctly differ between brands.

## Most patients use inhalers incorrectly

Incorrect technique when using inhaled medicines is very common among patients with asthma or chronic obstructive pulmonary disease (COPD).<sup>1-3</sup> Australian research studies have reported that only approximately 10% of patients use correct technique.<sup>4,5</sup>

High rates of incorrect inhaler use have been reported among children and adults<sup>1,6-9</sup> including experienced inhaler users.<sup>3</sup> Groups most likely to use inhalers incorrectly include young children,<sup>6,7</sup> older adults,<sup>10-12</sup> people with severe airflow limitation,<sup>11,13</sup> and people using more than one type of inhaler device.

Inhaler designs vary widely (Table 1). No inhaler type is foolproof; high rates of incorrect inhaler technique have been reported with pressurised metered dose inhalers and with various dry powder inhaler designs.<sup>1,2,7</sup> Switching between inhalers, or the use of two different inhaler types, can lead to incorrect use due to confusion between the different techniques needed.<sup>1</sup>

Regardless of the type of inhaler device prescribed, patients of any age are unlikely to use inhalers correctly unless they are given clear instruction, including a physical demonstration, and have their inhaler technique checked regularly.

Visit the *Australian Asthma Handbook* for information about choosing the best type of device for individual patients: [asthmahandbook.org.au](http://asthmahandbook.org.au).

## See inside for checklists

Table 1. Types of inhalers for asthma and COPD medicines

Type	Common medicines	Pharmacological class	Function
Manually actuated pressurised metered dose inhaler (puffer)	<i>Airomir <b>Inhaler</b></i> (salbutamol)	SABA	Reliever
	<i>APO-Salbutamol <b>Inhaler</b></i> (salbutamol)	SABA	
	<i>AsmolCFC-Free <b>Inhaler</b></i> (salbutamol)	SABA	
	<i>Ventolin CFC-Free <b>Inhaler</b></i> (salbutamol)	SABA	
	<i>Symbicort <b>Rapihaler</b></i> (budesonide plus formoterol)*	ICS + LABA	
	<i>Alvesco <b>Metered dose Inhaler</b></i> (ciclesonide)	ICS	Preventer
	<i>FlixotideJunior/Flixotide <b>Inhaler</b></i> (fluticasone propionate)	ICS	
	<i>Flutiform <b>Metered dose inhaler</b></i> (fluticasone propionate plus formoterol)	ICS + LABA	
	<i>Intal CFC-Free <b>Inhaler</b>/IntalForte CFC-Free Inhaler</i> (sodium cromoglycate)	Cromone	
	<i>Qvar <b>Inhaler</b></i> (beclometasone)	ICS	
	<i>Seretide <b>MDI</b></i> (fluticasone propionate plus salmeterol)	ICS + LABA	
	<i>Symbicort <b>Rapihaler</b></i> (budesonide plus formoterol)	ICS + LABA	
	<i>Tilade <b>CFC-Free</b></i> (nedocromil sodium)	Cromone	
	<i>Atrovent <b>Metered Aerosol</b></i> (ipratropium)	SAMA	Other bronchodilator
Breath-actuated pressurised metered dose inhaler	<i>Airomir <b>Autohaler</b></i> (salbutamol)	SABA	Reliever
	<i>Qvar <b>Autohaler</b></i> (beclometasone)	ICS	Preventer



Type	Common medicines	Pharmacological class	Function
Dry powder inhaler (multi-dose)	<i>Bricanyl <b>Turbuhaler</b></i> (terbutaline) <i>Onbrez <b>Breezhaler</b></i> (indacaterol)	SABA	Reliever
	<i>Symbicort <b>Turbuhaler</b></i> (budesonide plus formoterol)*	ICS + LABA	
	<i>Arnuity <b>Ellipta</b></i> (fluticasone furoate)	ICS	Preventer
	<i>Breo <b>Ellipta</b></i> (fluticasone furoate plus vilanterol)	ICS + LABA	
	<i>Flixotide <b>Accuhaler</b></i> (fluticasone propionate)	ICS	
	<i>Pulmicort <b>Turbuhaler</b></i> (budesonide)	ICS	
	<i>Seretide <b>Accuhaler</b></i> (fluticasone propionate plus salmeterol)	ICS + LABA	
	<i>Symbicort <b>Turbuhaler</b></i> (budesonide plus formoterol)	ICS + LABA	
	<i>Anoro <b>Ellipta</b></i> (umeclidinium plus vilanterol)	LAMA + LABA	Other bronchodilator
	<i>Bretaris <b>Genuair</b></i> (aclidinium)	LAMA	
	<i>Brimica <b>Genuair</b></i> (aclidinium plus formoterol)	LAMA + LABA	
	<i>Incruse <b>Ellipta</b></i> (umeclidinium)	LAMA	
	<i>Oxis <b>Turbuhaler</b></i> (formoterol)	LABA	
	<i>Serevent <b>Accuhaler</b></i> (salmeterol)	LABA	
Dry powder inhaler (capsule)	<i>Onbrez <b>Breezhaler</b></i> (indacaterol)	LABA	Other bronchodilator
	<i>Seebri <b>Breezhaler</b></i> (glycopyrronium)	LAMA	
	<i>Spiriva <b>Handihaler</b></i> (tiotropium)	LAMA	
	<i>Ultibro <b>Breezhaler</b></i> (glycopyrronium plus indacaterol)	LAMA + LABA	
Mist inhaler	<i>Spolto <b>Respimat</b></i> (tiotropium plus olodaterol)	LAMA + LABA	Other bronchodilator
	<i>Spiriva <b>Respimat</b></i> (tiotropium)	LAMA	

\* *Symbicort is classed as a reliever only when maintenance-and-reliever regimen has been prescribed*

**LABA:** long-acting beta<sub>2</sub> agonist;

**LAMA:** long-acting muscarinic antagonist  
(long-acting anticholinergic bronchodilator);

**ICS:** inhaled corticosteroid;

**SABA:** short-acting beta<sub>2</sub> agonist;

**SAMA:** short-acting muscarinic antagonist  
(anticholinergic bronchodilator)

## Poor inhaler technique can worsen symptoms and flare-ups in asthma and COPD

When inhalers are used incorrectly, the full dose may fail to reach the target area in the lung.<sup>14</sup> When using a reliever, this could mean the patient fails to achieve good symptom relief, or maximal bronchodilation and improvement in lung function.<sup>14</sup> When using an inhaled corticosteroid preventer, this could mean that the medicine does not reach sites of inflammation, including in the small airways,<sup>14</sup> and it increases the risk of local side-effects such as dysphonia and oral thrush.

Certain errors (e.g. breathing out when actuating a pressurised metered dose inhaler, loading a *Turbuhaler* when it is horizontal, failing to slide the lever on an *Accuhaler*, or not piercing the capsule in a single-dose dry powder inhaler) could result in no medicine being inhaled at all.

Poor inhaler technique can lead to poor asthma symptom control and overuse of relievers and preventers.<sup>1-3, 14, 15</sup> In patients with asthma and COPD, incorrect technique is associated with a 50% increased risk of hospitalisation, increased emergency department visits and increased use of oral corticosteroids.<sup>3</sup> Correcting patients' inhaler technique has been shown to improve asthma control, asthma-related quality of life and lung function.<sup>16, 17</sup>

Among patients with poorly controlled asthma referred to specialised asthma clinics<sup>18, 19</sup> or assessed in community pharmacies,<sup>20</sup> a high proportion are found to have poor inhaler technique. Both inhaler technique and adherence should always be checked before increasing the dose or changing the treatment regimen for patients who have not achieved good asthma symptom control or continue to have flare-ups despite appropriate treatment. For patients with severe asthma being considered for specialised medicines such as omalizumab, inhaler technique must be checked and documented.

Visit the *Australian Asthma Handbook* for information about adjusting medicines to control asthma in children or adults: [astmahandbook.org.au](http://astmahandbook.org.au).

## How to train patients to use inhalers properly

Correct technique depends on the inhaler type, so patients need to understand the right steps for their own inhaler. Training by health professionals can improve adults and children's inhaler technique for a range of inhaler types.<sup>1, 7</sup>

### Watch, don't just ask

Ask the person to show you how they use their inhaler and check their technique against the checklist for that type of inhaler. Use the [Checklists for inhaler technique](#).

Don't rely on patients' own assessment of their inhaler technique, even for experienced inhaler users. In an Australian study, 75% patients using an inhaler for an average of 2–3 years reported they were using their inhaler correctly but, on objective checking, only 10% showed the correct technique.<sup>4</sup>

### Show, don't just tell

The best way to train patients to use their inhalers correctly is one-to-one training by a healthcare professional (e.g. nurse, pharmacist, GP), that involves both verbal instruction and physical demonstration.<sup>1, 21, 22</sup> Patients do not learn to use their inhalers properly just by reading the manufacturer's leaflet.<sup>21</sup>

Australian randomised controlled trials have shown that adults with asthma are more likely to use their inhaler correctly after a health professional demonstrated the correct technique using a placebo inhaler as well as explaining and providing written instructions, than after receiving only written and verbal instructions<sup>5</sup> or after written instructions only.<sup>9</sup>

An effective method is to assess the individual's technique by comparing each step to a checklist specific to the type of inhaler, and then provide written instructions about errors (e.g. a sticker attached to the device).<sup>4, 17</sup>

### Repeat, don't just prescribe or dispense

Even after achieving correct technique through training, patients can lose these skills within 2–3 months.<sup>5, 16</sup> Inhaler technique must be rechecked and training must be repeated regularly to help children and adults maintain correct technique.<sup>1, 6</sup>

Community pharmacists can reinforce correct technique by reassessing technique and repeating the training each time they dispense a device.<sup>4</sup>

## Basic principles and common errors

Beta<sub>2</sub>-agonist bronchodilators, which act on beta<sub>2</sub> receptors in the airway smooth muscle, may be more effective when particles are deposited in larger airways.<sup>14</sup> For inhaled corticosteroids, the goal is distribution throughout the airways, but this is not guaranteed because particle size and the speed of the patient's inhalation determines where the medicine is deposited.<sup>14</sup>

Each type of inhaler device requires a specific technique to ensure that the medicine is delivered to the target region of

the airways and to minimise deposition in the oropharynx (see [Checklists for inhaler technique](#)). The inhaler checklists have been harmonised where possible, to minimise confusion for patients.<sup>23</sup>

## Pressurised metered dose inhalers

Pressurised metered dose inhalers require slow, deep inhalation coordinated with actuation.<sup>2, 14, 18</sup> It is essential for the dose to be released at the same time or very soon after the patient starts inhaling – not before.<sup>1, 14</sup> If the person breathes in too rapidly, the medicine is more likely to be deposited in the oropharynx and fail to penetrate the airways.<sup>1, 14</sup>

Common errors with pressurised metered dose inhalers include:<sup>1, 3, 8, 9</sup>

- failing to shake the inhaler before actuating
- holding the inhaler in wrong position
- failing to exhale fully before actuating the inhaler
- actuating the inhaler too early or during exhalation (the medicine may be seen escaping from the top of the inhaler)
- actuating the inhaler too late while inhaling
- actuating more than once while inhaling
- inhaling too rapidly (this can be especially difficult for children to overcome)<sup>1</sup>
- failing to hold breath long enough after inhaling
- multiple actuations without shaking between doses.

The use of a spacer with a pressurised metered dose inhaler can help reduce problems with timing of inhalation and actuation, and reduce deposition of medicine in the mouth.

**Methods for using a pressurised metered dose inhaler and spacer** – there are two methods (see checklists). The preferred method is to take a single slow deep breath after actuation, then hold the breath for 5 seconds. The second method, using multiple breaths (tidal breathing), is used for those who cannot coordinate actuation and breathing (e.g. very young children) or during acute flare-ups. Inhaler technique should be checked after an emergency department presentation, as patients may only have experienced the tidal breathing technique.

**Empty inhalers** – patients using pressurised metered dose inhaler often fail to notice their inhaler is empty or nearly empty, or has passed the expiry date. For inhalers without a dose counter, there is no reliable way to tell when the inhaler is empty. Placing the canister in water to check if it floats was sometimes used in the past, but this technique is no longer recommended as it does not work with the modern CFC-free formulations. The canister from inhalers containing inhaled corticosteroids or cromones must never be placed into water, as this rapidly causes clogging.

Use the checklists for manually actuated pressurised metered dose inhalers (puffers) with and without spacers, single-breath method and multiple-breath method.

Visit the National Asthma Council Australia website for videos and patient brochures on how to use a pressurised metered dose inhaler:  
[www.nationalasthma.org.au/how-to-videos/using-your-inhaler](http://www.nationalasthma.org.au/how-to-videos/using-your-inhaler).

## Dry powder inhalers

Some dry powder inhalers contain multiple doses, and others require a capsule to be inserted for each separate dose.

Dry powder inhalers require forceful and deep inhalation.<sup>1, 2, 14, 18, 24</sup> It is essential that the person inhales strongly right from the start and continues for as long as possible.<sup>1</sup> Strong flow is necessary to create the turbulence needed to transform the powder formulation into particles that can be deposited in the lung.<sup>1, 2, 14</sup> The optimal rate of inhalation differs between inhaler designs because some have higher resistance than others.

If the patient does not inhale fast enough or long enough, part of the dose may not be emitted from the inhaler, or the particles generated may be too big to enter the lungs – resulting in insufficient lung deposition and increased oropharyngeal deposition.<sup>7, 14</sup> Correct technique can be difficult or impossible during an acute asthma flare-up, or for young children or people with COPD at any time.<sup>1, 25</sup>

Patients must avoid exhaling into the device, to prevent moisture contamination of the powder and to avoid blowing the powder away.

Common errors for dry powder inhalers include:<sup>3, 7-9</sup>

- tilting the device instead of keeping it in the correct position while loading the dose (horizontal for *Accuhaler* or vertical for *Turbuhaler*)
- failing to exhale fully before inhaling
- failing to inhale completely
- inhaling too slowly and weakly
- exhaling into the device mouthpiece before or after inhaling
- failing to close the inhaler after use
- using past the expiry date or when empty.

Use the checklists for dry powder inhalers.  
Visit the National Asthma Council Australia website for videos and patient brochures on how to use different types of dry powder inhalers: [www.nationalasthma.org.au/how-to-videos/using-your-inhaler](http://www.nationalasthma.org.au/how-to-videos/using-your-inhaler).

## Concurrent use of multiple device types

Ideally, each patient should be prescribed only a single inhaler type. If this is not possible, patients need clear instructions to avoid confusion. For example:

- One inhaler may need to be shaken (e.g. a pressurised metered dose inhaler) while another must never be shaken (e.g. *Accuhaler*, *Ellipta*).
- A person using both a pressurised metered dose inhaler and a dry powder inhaler should inhale slowly with the pressurised metered dose inhaler, but more forcefully with their dry powder inhaler.
- One inhaler may need washing while another must never come in contact with moisture.

## Other practice points

**Mouthpiece or mask** – Sealing the lips firmly around the mouthpiece is essential for all devices (including spacers). The mouthpiece should be placed between the teeth, without biting it. An open-mouth technique was sometimes used in the past, but this is no longer recommended. With pressurised metered dose inhalers, a tightly fitting face mask can be used with a spacer for people who cannot form a close seal around the spacer mouthpiece (e.g. preschool children or people with cognitive impairment). Nasal breathing is more effective than mouth breathing in preschool children while using a mask.<sup>1</sup>

**Babies** – Babies are unlikely to inhale enough medicine while crying.<sup>1</sup> The use of a spacer and face mask for a crying infant may require patience and skill: the child can be comforted (e.g. held by a parent, in own pram, or sitting on the floor) while the mask is kept on, and the actuation carefully timed just before the next intake of breath. Most infants will tolerate the spacer and mask eventually. The child may be more likely to accept the spacer and mask if allowed to handle them first (and at other times), if are personalised (e.g. with stickers), or if the mask has a scent associated with the mother (e.g. lip gloss). The use of a spacer with a coloured valve allows parents to see the valve move as the child breathes in and out.

**Dexterity problems** – Some people may have difficulty manipulating devices due to problems with dexterity (e.g. osteoarthritis, stroke, muscle weakness). The *Australian Asthma Handbook* ([astmahandbook.org.au](http://astmahandbook.org.au)) contains information about choosing the appropriate type of device for individual patients.

**Preventers** – People taking inhaled corticosteroids should rinse their mouth with water and spit out after each dose to reduce the risk of oropharyngeal candidiasis ('thrush') caused by medicine deposited in the mouth.

There is no need to take a reliever routinely before taking a preventer. Relievers should only be used for treating symptoms, or before exercise if required.

## Care and maintenance of inhalers and spacers

INHALERS	SPACERS
<p>Patients should follow the manufacturer's instructions on caring for devices.</p> <p>Key points:</p> <ul style="list-style-type: none"><li>• <b>ICS-containing pressurised metered dose inhalers</b> – must never be washed (should be wiped with a dry tissue)</li><li>• <b>Multi-dose dry powder inhalers</b> – must never be washed (can be wiped with a dry tissue)</li><li>• <b>Handihaler</b> – must be washed at least monthly</li><li>• <b>Cromone inhalers</b> – mouthpiece must be washed every day and dried for more than 24 hours before use, to avoid clogging.</li></ul> <p>Ideally, the mouthpiece of bronchodilator pressurised metered dose inhalers should be washed every week and dried before re-use.</p>	<p>Before first use:</p> <ul style="list-style-type: none"><li>• Plastic spacers (e.g. <i>Breath-A-Tech</i>, <i>Volumatic</i>) must be washed before first use to reduce electrostatic charge. If this is not done, particles will be attracted to the surface and part of the dose will be lost.</li><li>• Washing to reduce electrostatic charge is not necessary for disposable cardboard spacers or polyurethane spacers (e.g. <i>AeroChamber Plus</i>, <i>La Petite E-Chamber</i>, <i>La Grande E-Chamber</i>).</li></ul> <p>Hygiene and maintenance:</p> <ul style="list-style-type: none"><li>• Plastic or polyurethane spacers should be cleaned each month and after a respiratory tract infection.</li><li>• Spacers should be checked every 6–12 months for cracks and faulty valves.</li></ul> <p>How to clean a spacer:</p> <ul style="list-style-type: none"><li>• Disassemble by following the manufacturer's instructions (if necessary).</li><li>• Wash parts in warm water with liquid dishwashing detergent. Do not rinse.</li><li>• Allow to air-dry without wiping.</li><li>• When completely dry, reassemble carefully.</li></ul>

## Checklists for inhaler technique

These checklists are intended for health professionals to use when assessing patients' inhaler technique. The checklists have been harmonised where possible, to minimise confusion for patients.<sup>23</sup>

Instructions for patients and demonstration videos for all common inhaler types are available at [nationalasthma.org.au](http://nationalasthma.org.au)

### Checklist for manually actuated pressurised metered dose inhaler (puffer)

1. Remove cap (some must be squeezed at the sides to release)
2. Check dose counter (if device has one)
3. Hold inhaler upright and shake well.
4. Breathe out gently (away from inhaler).
5. Put mouthpiece between teeth (without biting) and close lips to form good seal.
6. Start to breathe in slowly through mouth and, at the same time, press down firmly on canister.
7. Continue to breathe in slowly and deeply.
8. Hold breath for about 5 seconds or as long as comfortable.
9. While holding breath, remove inhaler from mouth.
10. Breathe out gently (away from the inhaler).
11. If more than one dose is needed, repeat all steps starting from step 3.
12. Replace cap.



Figure 1: Metered dose inhaler showing correct position of inhaler and good seal with lips around mouthpiece.

#### Notes:

The patient should keep their chin up so the inhaler stays upright (not aimed at roof of mouth or tongue).

Problems coordinating inhalation and actuation with a pressurised metered dose inhaler (step 6) can often be overcome by using a spacer.

A spacer should be used when taking an inhaled corticosteroid, whenever possible.

The correct rate of inhalation (step 7) may be easier to learn by watching a demonstration.<sup>5</sup>

If a patient has trouble actuating the device, suggest they use both hands. People with weak hands or osteoarthritis may benefit from the use of a *Haleraid* device (available in two sizes, but will not fit all inhalers).

### Checklist for manually actuated pressurised metered dose inhaler (puffer) plus spacer (single breath method)

1. Assemble spacer (if necessary).
2. Remove inhaler cap (some must be squeezed at the sides to release).
3. Check dose counter (if device has one).
4. Hold inhaler upright and shake well.
5. Insert inhaler upright into spacer.
6. Put mouthpiece between teeth (without biting) and close lips to form good seal.
7. Breathe out gently, into the spacer.
8. Keep spacer horizontal and press down firmly on inhaler canister once.
9. Breathe in slowly and deeply.
10. Hold breath for about 5 seconds or as long as comfortable.
11. While holding breath, remove spacer from mouth.
12. Breathe out gently.
13. If more than one dose is needed, repeat all steps starting from step 4.
14. Remove inhaler from spacer.
15. Replace inhaler cap.



Figure 2: Metered dose inhaler plus spacer showing good seal with lips around mouthpiece.

#### Notes:

Except in severe acute asthma, only one puff should be actuated into the spacer and inhaled from the spacer at a time.

A tightly fitting face mask can be used with a spacer for people who cannot form a close seal around the spacer mouthpiece (e.g. preschool children or people with cognitive impairment). Nasal breathing is more effective than mouth breathing in preschool children while using a mask.<sup>1</sup>

Patients should avoid a delay between steps 8 and 9. After the inhaler device

is actuated into the spacer, the medicine only remains suspended and available for inhaling for a short time.

If the person cannot manage a single breath followed by breath holding (steps 9–10), use the multiple-breaths (tidal breathing) method.

Make sure the person also knows how to use their inhaler correctly without a spacer.

## Checklist for manually actuated pressurised metered dose inhaler (puffer) plus spacer (multiple breath method)

1. Assemble spacer (if necessary).
2. Remove inhaler cap.
3. Check dose counter (if device has one).
4. Hold inhaler upright and shake well.
5. Insert inhaler upright into spacer.
6. Put mouthpiece between teeth (without biting) and close lips to form good seal.
7. Breathe out gently, into the spacer.
8. Keep spacer horizontal and press down firmly on inhaler canister once.
9. Breathe in and out normally for 3 or 4 breaths.
10. Remove spacer from mouth.
11. Breathe out gently.
12. Remove inhaler from spacer.
13. If more than one dose is needed, repeat all steps starting from step 3.
14. Replace inhaler cap.

### Notes:

The multiple breath (tidal breathing) method can be used for young children or during acute flare-ups.

Except in severe acute asthma, only one puff should be actuated into the spacer and inhaled from the spacer at a time.

## Checklist for Accuhaler

1. Check dose counter.
2. Open cover (use thumb grip).
3. Load dose: keep device horizontal while sliding lever until it clicks. (Do not shake.)
4. Breathe out gently (away from inhaler).
5. Put mouthpiece in mouth (without biting) and close lips to form a good seal. (Keep inhaler horizontal).
6. Breathe in steadily and deeply.
7. Hold breath for about 5 seconds or as long as comfortable.
8. While holding breath, remove inhaler from mouth.
9. Breathe out gently (away from the inhaler)
10. If more than one dose is prescribed,\* repeat all steps starting from step 3.
11. Close cover to click shut.



Figure 4: Accuhaler showing correct position of inhaler and good seal with lips around mouthpiece.

### Notes:

The inhaler should not be shaken.

The inhaler should not be held with the mouthpiece pointing downwards during or after loading the dose, because the medicine could dislodge.

Common errors include failing to exhale before inhaling, exhaling into the device mouthpiece, failing to inhale fully, inhaling too weakly, failing to hold breath after inhaling, and keeping device in a humid place.

\* Not generally appropriate for medicines delivered by Accuhaler

## Checklist for Autohaler

1. Remove cap.
2. Hold inhaler upright and shake well.
3. Push lever up.
4. Breathe out gently (away from inhaler).
5. Put mouthpiece between teeth (without biting) and close lips to form good seal.
6. Breathe in slowly and deeply. Keep breathing in after click is heard.
7. Hold breath for about 5 seconds or as long as comfortable.
8. While holding breath, remove inhaler from mouth.
9. Breathe out gently (away from inhaler)
10. Push lever down
11. If more than one dose is needed, repeat all steps starting from step 2.
12. Replace cap.

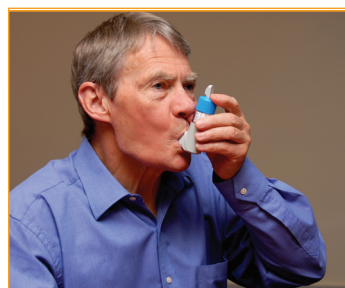


Figure 5: Autohaler showing correct position of inhaler and good seal with lips around mouthpiece.

### Notes:

The patient should keep their chin up so the inhaler stays upright (not aimed at roof of mouth or tongue).

Common errors when using Autohaler include failing to raise the lever, stopping inhaling immediately after hearing the click, and exhaling into the device.

## Checklist for *Breezhaler*

1. Remove cap.
2. Rotate to open mouthpiece.
3. Remove capsule from blister and place in chamber.
4. Close mouthpiece until it clicks.
5. Press side piercing buttons in once and release. (Do not shake.)
6. Breathe out gently (away from mouthpiece).
7. Put mouthpiece between teeth (without biting) and close lips to form good seal.
8. Breathe in rapidly and steadily, so capsule vibrates.
9. Continue to breathe in as long as comfortable.
10. Hold breath for about 5 seconds, or as long as comfortable. While holding breath, remove inhaler from mouth.
11. Breathe out gently (away from mouthpiece).
12. Open mouthpiece and remove used capsule.
13. If more than one dose is needed, \*repeat all steps starting from step 3.
14. Close mouthpiece and cap.

## Checklist for *Ellipta*

1. Check dose counter. (Do not shake at any time.)
2. Slide cover down until a click is heard.
3. Breathe out gently (away from inhaler)
4. Put mouthpiece in mouth and close lips to form a good seal. (Do not block air vent with fingers.)
5. Breathe in steadily and deeply.
6. Hold breath for 5 seconds or as long as comfortable.
7. While holding breath, remove inhaler from mouth.
8. Breathe out gently (away from inhaler)
9. Slide the cover upwards as far as it will go, to cover the mouthpiece.

## Checklist for *Genuair*

1. Check dose counter. (Do not shake at any time.)
2. Remove cap by squeezing arrows on each side and pulling outwards.
3. Hold inhaler horizontally with large coloured button facing straight up. Without tilting inhaler, press and release the button.
4. Check that control window has changed to green.
5. Breathe out gently (away from inhaler).
6. Put mouthpiece in mouth and close lips to form a good seal. Keep inhaler horizontal.
7. Breathe in strongly and deeply. Keep breathing in after click is heard.
8. Hold breath for about 5 seconds or as long as comfortable.
9. While holding breath, remove inhaler from mouth.
10. Breathe out gently (away from inhaler).
11. Check that control window has changed to red.
12. Replace cap.

### Notes:

Common errors include failing to pierce the capsule, piercing it more than once, failure to use a new capsule for each dose, and failing to breathe in forcefully enough.

\* Not usually appropriate for medicines delivered by *Breezhaler*

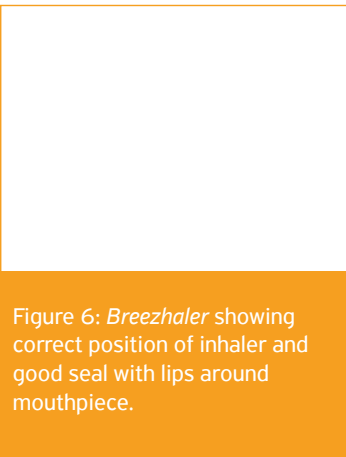


Figure 6: *Breezhaler* showing correct position of inhaler and good seal with lips around mouthpiece.

### Notes:

The inhaler must not be shaken.

Before first use, the inhaler must be removed from the foil package and used within a month of opening.

The mouthpiece should not be opened until the patient is ready to inhale the dose (if the mouthpiece is re-closed, the dose is lost).

Common errors include shaking the inhaler, opening the mouthpiece without inhaling a

dose, leaving the mouthpiece open, covering vent with the hand, exhaling into or near the mouthpiece, and failing to close the cover after inhaling.




Figure 7: *Ellipta* showing correct position of inhaler and good seal with lips around mouthpiece and vents not covered.

### Notes:

The inhaler should not be shaken.

Common errors include failure to exhale before inhaling, trying to inhale with cap on, exhaling into the device mouthpiece after loading the dose, inhaling before control window is green, holding green button down while inhaling, failure to inhale strongly enough, stopping inhalation too early, failure to hold breath long enough after inhalation.




Figure 8: *Genuair* showing removing cap and checking of control window colour.

## Checklist for *HandiHaler*

1. Open cap.
2. Open mouthpiece.
3. Peel back foil, remove capsule and put capsule in chamber.
4. Close mouthpiece until it clicks.
5. Press green piercing button in once and release.(Do not shake.)
6. Breathe out gently (away from mouthpiece).
7. Put mouthpiece between teeth (without biting) and close lips for form good seal.
8. Breathe in slowly and deeply, so capsule vibrates.
9. Keep breathing in as long as comfortable.
10. While holding breath, remove inhaler from mouth.
11. Breathe out gently (away from mouthpiece).
12. Repeat steps 7–11 to take the full dose.
13. Open mouthpiece and remove used capsule.
14. Close mouthpiece.
15. Close cap.

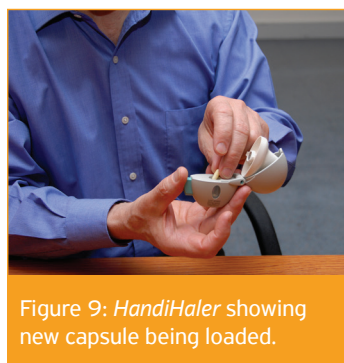


Figure 9: *HandiHaler* showing new capsule being loaded.

### Notes:

The inhaler should not be shaken after the capsule has been pierced.

Potential errors include failing to pierce the capsule, piercing it more than once, failing to inhale the second time to take the whole dose, failing to replace spent capsule after taking the full dose, and failing to breathe in deeply enough.

## Checklist for *Respimat* (loading before first use)

1. Keep the cap closed.
2. Remove clear base: press safety catch while firmly pulling off base with other hand.
3. Insert the narrow end of the cartridge into the inhaler.
4. Place the inhaler on a firm surface and push down firmly until it snaps into place.
5. Put the clear base back into place until it clicks.
6. Turn the clear base in the direction of the arrows on the label until it clicks (half a turn).
7. Open the cap until it snaps fully open.
8. Point the inhaler toward the ground. Then press the dose-release button.
9. Close the cap.
10. Repeat steps 6–9 until you see a cloud coming out when you press the dose-release button.
11. Repeat steps 6–9 three more times.



Figure 10: *Respimat* loading on a firm surface

### Notes:

Suggest that patients ask their pharmacist to load the cartridge.

## Checklist for *Respimat* (daily use after loaded)

1. Hold inhaler upright with the cap closed
2. Turn base in direction of arrows on label until it clicks (half a turn).
3. Open the cap until it snaps fully open.
4. Breathe out gently (away from inhaler).
5. Put mouthpiece in mouth and close lips to form a good seal. (Do not cover air vents.)
6. Start to breathe in slowly and deeply through mouth and, at the same time, press down on the dose button.
7. Continue to breathe in slowly and deeply.
8. Hold breath for 5 seconds or as long as comfortable.
9. While holding breath, remove inhaler from mouth.
10. Breathe out gently (away from mouthpiece).
11. Close cover to click shut.
12. Two inhalations is the usual dose for medicines used with *Respimat*. Repeat from step 1 to get the full dose.

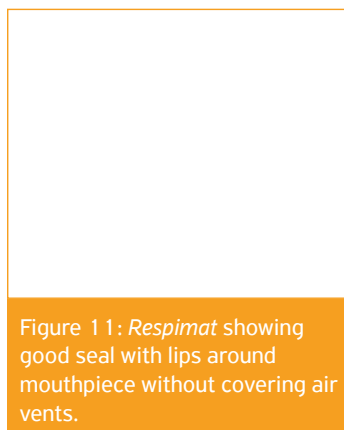


Figure 11: *Respimat* showing good seal with lips around mouthpiece without covering air vents.

### Notes:

See separate instructions for loading the cartridge and priming the device.

Common errors include exhaling into the device mouthpiece, and failure to replace the mouthpiece cover after inhaling.

## Checklist for *Turbuhaler*

1. Unscrew and remove cover.
2. Check dose counter.
3. Keep inhaler upright while twisting grip at the base: twist around and then back until click is heard.
4. Breathe out gently (away from the inhaler).
5. Put mouthpiece between teeth (without biting) and close lips to form good seal. (Do not cover the air vents.)
6. Breathe in strongly and deeply.
7. Hold breath for about 5 seconds or as long as comfortable.
8. Remove inhaler from mouth.
9. Breathe out gently (away from the inhaler)
10. If more than one dose is needed, repeat all steps starting from step 3.
11. Replace cover.



Figure 12: *Turbuhaler* showing good seal with lips around mouthpiece and adequate inhalation.

### Notes:

Common errors include failure to exhale before inhaling, failure to turn the grip fully in both directions, failure to keep the device upright while loading, failure to inhale strongly enough, and allowing excess moisture into the device by exhaling into the mouthpiece or failure to keep cap on when not in use.

Patients need to inhale forcefully to release the particles. A strong airflow right from the start of inhalation is necessary to break up particles so

they can reach the airways. This may be difficult for older people and those with severe airflow limitation<sup>7</sup>(not recommended for children).

The chin should be slightly raised during inhalation. The inhaler only needs to be kept vertical while a dose is being loaded (by twisting the base around and then back).

When a new *Symbicort Turbuhaler* is opened, it needs to be primed by twisting the base in both directions, then repeating this, before the first dose is loaded. The extra two twists around and back only need to be done before the *Turbuhaler* is first used.

## References

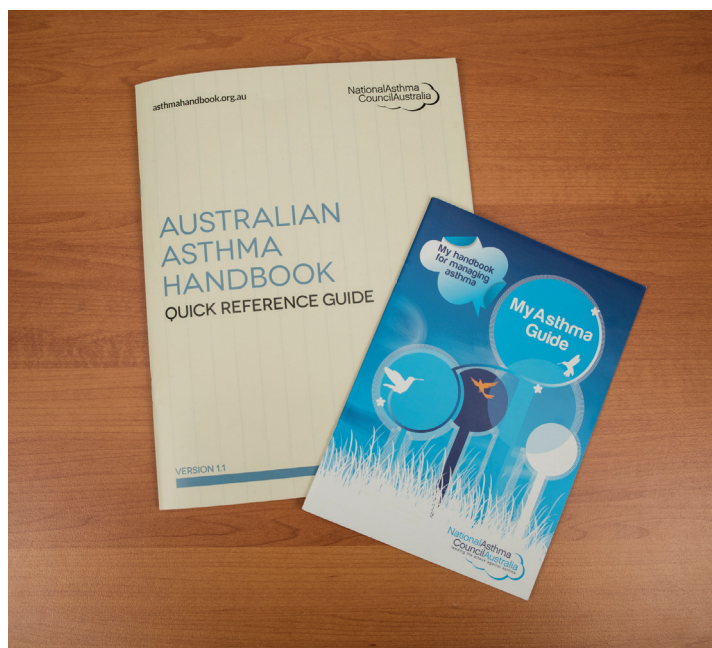
1. The Inhaler Error Steering Committee, Price D, Bosnic-Anticevich S *et al.* Inhaler competence in asthma: common errors, barriers to use and recommended solutions. *Respir Med* 2013; 107: 37-46.
2. Bjermer L. The importance of continuity in inhaler device choice for asthma and chronic obstructive pulmonary disease. *Respiration* 2014; 88: 346-52.
3. Melani AS, Bonavia M, Cilenti V *et al.* Inhaler mishandling remains common in real life and is associated with reduced disease control. *Respir Med* 2011; 105: 930-8.
4. Basheti IA, Armour CL, Bosnic-Anticevich SZ, Reddel HK. Evaluation of a novel educational strategy, including inhaler-based reminder labels, to improve asthma inhaler technique. *Patient Educ Couns* 2008; 72: 26-33.
5. Bosnic-Anticevich SZ, Sinha H, So S, Reddel HK. Metered dose inhaler technique: the effect of two educational interventions delivered in community pharmacy over time. *J Asthma* 2010; 47: 251-6.
6. Capanoglu M, Dibek Misirlioglu E, Toyran M *et al.* Evaluation of inhaler technique, adherence to therapy and their effect on disease control among children with asthma using metered dose or dry powder inhalers. *J Asthma* 2015; 52: 838-45.
7. Lavorini F, Magnan A, Dubus JC *et al.* Effect of incorrect use of dry powder inhalers on management of patients with asthma and COPD. *Respir Med* 2008; 102: 593-604.
8. Federman AD, Wolf MS, Sofianou A *et al.* Self-management behaviors in older adults with asthma: associations with health literacy. *J Am Geriatr Soc* 2014; 62: 872-9.
9. Crane MA, Jenkins CR, Goeman DP, Douglass JA. Inhaler device technique can be improved in older adults through tailored education: findings from a randomised controlled trial. *NPJ primary care respiratory medicine* 2014; 24: 14034.
10. Choroa P, Pereira AM, Fonseca JA. Inhaler devices in asthma and COPD – an assessment of inhaler technique and patient preferences. *Respir Med* 2014; 108: 968-75.
11. Wieshammer S, Dreyhaupt J. Dry powder inhalers: which factors determine the frequency of handling errors? *Respiration* 2008; 75: 18-25.
12. Sestini P, Cappiello V, Aliani M *et al.* Prescription bias and factors associated with improper use of inhalers. *J Aerosol Med* 2006; 19: 127-36.
13. Broeders ME, Molema J, Hop WC, Folgering HT. Inhalation profiles in asthmatics and COPD patients: reproducibility and effect of instruction. *J Aerosol Med* 2003; 16: 131-41.
14. Haughney J, Price D, Barnes NC *et al.* Choosing inhaler devices for people with asthma: current knowledge and outstanding research needs. *Respir Med* 2010; 104: 1237-45.
15. Giraud V, Roche N. Misuse of corticosteroid metered dose inhaler is associated with decreased asthma stability. *Eur Respir J* 2002; 19: 246-51.
16. Basheti IA, Reddel HK, Armour CL, Bosnic-Anticevich SZ. Improved asthma outcomes with a simple inhaler technique intervention by community pharmacists. *J Allergy Clin Immunol* 2007; 119: 1537-8.
17. Giraud V, Allaert FA, Roche N. Inhaler technique and asthma: feasibility and acceptability of training by pharmacists. *Respir Med* 2011; 105: 1815-22.
18. Harnett CM, Hunt EB, Bowen BR *et al.* A study to assess inhaler technique and its potential impact on asthma control in patients attending an asthma clinic. *J Asthma* 2014; 51: 440-5.
19. Hardwell A, Barber V, Hargadon T *et al.* Technique training does not improve the ability of most patients to use pressurised metered dose inhalers (pMDIs). *Prim Care Respir J* 2011; 20: 92-6.
20. Armour CL, Lemay K, Saini B *et al.* Using the community pharmacy to identify patients at risk of poor asthma control and factors which contribute to this poor control. *J Asthma* 2011; 48: 914-22.
21. Lavorini F. Inhaled drug delivery in the hands of the patient. *J Aerosol Med Pulm Drug Deliv* 2014; 27: 414-8.
22. Newman S. Improving inhaler technique, adherence to therapy and the precision of dosing: major challenges for pulmonary drug delivery. *Expert opinion on drug delivery* 2014; 11: 365-78.
23. Basheti IA, Bosnic-Anticevich SZ, Armour CL, Reddel HK. Checklists for dry powder inhaler technique: a review and recommendations. *Respir Care* 2013; Epub 15 October.
24. Chrystyn H, Price D. Not all asthma inhalers are the same: factors to consider when prescribing an inhaler. *Prim Care Respir J* 2009; 18: 243-9.
25. Broeders ME, Sanchis J, Levy ML *et al.* The ADMIT series – issues in inhalation therapy. 2. Improving technique and clinical effectiveness. *Prim Care Respir J* 2009; 18.

## More information

National Asthma Council Australia provides resources and training:

Inhaler demonstration videos and instruction handouts  
([nationalasthma.org.au](http://nationalasthma.org.au))

Asthma education and training workshops  
([nationalasthma.org.au](http://nationalasthma.org.au)).



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