

# Prescribing CFC-free lung medicines

Information for health professionals



## Summary

Some types of inhalers for lung medicines used in asthma or chronic obstructive pulmonary disease (COPD) will be phased out after 2010, because they contain chlorofluorocarbons (CFCs). CFCs are being phased out in industry, home products and medicines because they harm the Earth's stratospheric ozone layer.

Instead, doctors will need to prescribe inhalers that do not contain CFCs—either dry-power inhalers or CFC-free pressurised metered-dose inhalers.

While patients are changing to new inhalers, doctors and other health professionals can use this opportunity to check whether each patient's asthma or COPD is well controlled, and make sure that each patient understands the correct way to use, clean and care for their inhaler.



## Information in this paper

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- **Dry-powder inhalers**
- **CFC-free pressurised metered-dose inhalers**
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- **Caring for patients while they change to a different inhaler**
- **CFC-free inhalers available in Asia & the Pacific region**
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Some essential medicines for asthma and COPD are taken using inhalers, because they work better and are safer than in oral form. The main types of inhalers are pressurised metered-dose inhalers and dry-powder inhalers. Different types of inhalers are appropriate for different patients, depending on the person's physical and mental abilities, medical condition, local conditions and the medication prescribed.<sup>1</sup>

## CFCs in inhalers

In pressurised metered-dose inhalers, liquid medication is stored inside a canister. The canister also contains a propellant. The propellant converts the medicine into small particles so that it can be breathed deep into the lungs. The propellant evaporates before it reaches the lungs. In the past, most pressurised metered-dose inhalers contained CFCs as propellants.

Around the world, manufacturers are phasing out the use of CFCs in industry and home products because they can damage the ozone layer in the Earth's atmosphere. The ozone layer protects the Earth from harmful ultraviolet radiation from the sun.

Manufacturers are gradually ceasing to make and sell inhalers that contain CFCs. From 2010, these will be less available and will eventually become unavailable according to the transition strategies in each country.

Patients with asthma or COPD who are using CFC-containing pressurised metered-dose inhalers must eventually change to a different type of inhaler. Patients can change to either a CFC-free pressurised metered-dose inhaler, or a dry-powder inhaler. Dry-powder inhalers do not contain propellants.

## Safety of inhalers that contain CFCs

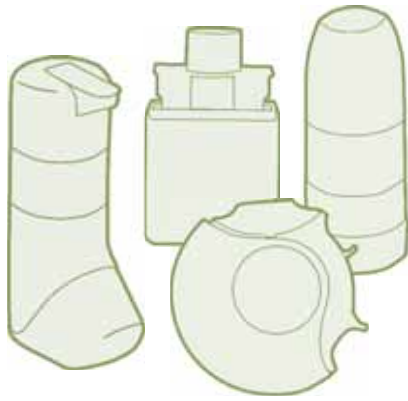
### Safety of patients

The CFCs in inhaled medications evaporate on inhalation and do not have any significant risks for patients' health. Patients can keep using their old inhalers until depleted.

### Safety of the environment

CFCs are being phased out around the world because they harm the Earth's ozone layer. Inhalers that contain CFCs are some of the last CFC products still in use. All CFC-containing products, including these inhalers, will be banned by countries that have signed the Montreal Protocol on Substances that Deplete the Ozone Layer.

The Montreal Protocol is an international treaty to gradually stop producing and using chemicals that damage the stratospheric ozone layer. Currently 195 countries have joined the agreement and are taking action.



## Dry-powder inhalers

Dry-powder inhalers are available for various lung medicines in single doses and multiple doses. These inhalers are as effective and safe for patients as pressurised metered-dose inhalers.

Dry-powder inhalers do not contain propellants, so they will continue to be available and will not change. Patients who use dry-powder inhalers can keep using their inhalers.

Dry-powder inhalers are not suitable for all patients, such as people who cannot breathe in forcefully enough to make the device work properly.<sup>5</sup> Metered-dose inhalers are usually recommended for short-acting beta<sub>2</sub> agonists during acute or life-threatening asthma episodes.

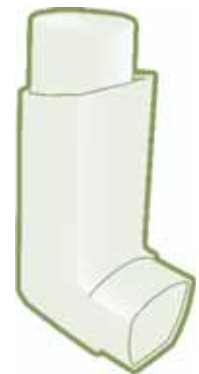
In humid climates, dry-powder inhalers can become blocked because the powder absorbs moisture, but they can be used effectively in these regions if cared for appropriately.<sup>2</sup> Patients should be taught to keep their inhaler closed or covered and in a dry place. Patients must also be instructed not to breathe into the inhaler.

## CFC-free pressurised metered-dose inhalers

Pharmaceutical companies have developed newer types of pressurised metered-dose inhalers to replace older inhalers that contain CFCs (Table 1). This research program involved large budgets and many years of testing to ensure equivalent efficacy and safety.<sup>3</sup>

Instead of CFCs, the propellants in these newer inhalers are hydrofluoroalkanes (HFAs, also called hydrofluorocarbons). HFAs do not damage the ozone layer. HFAs are greenhouse gases, but they cause less global warming than CFCs. HFA-134a is the most commonly used propellant in the new inhalers. Its potential to cause global warming (greenhouse effect) is approximately one-sixth of the greenhouse effect of CFCs.

It was necessary to develop new technology to make the HFAs suitable for use in pressurised metered-dose inhalers.<sup>3</sup>



## Clinical efficacy of CFC-free pressurised metered-dose inhalers\*

### Short-acting beta<sub>2</sub> agonist bronchodilators

Clinical trials of salbutamol<sup>4-6</sup> and of fenoterol<sup>7</sup> show that HFA inhalers are as effective as CFC-containing inhalers in adults and children with asthma.

### Inhaled corticosteroids

There are two types of new formulations of inhaled corticosteroids for HFA inhalers: suspensions and solutions.<sup>8</sup>

The HFA suspensions (budesonide, fluticasone propionate, triamcinolone acetonide, mometasone furoate) are very similar to the older CFC formulations of the same medicine.<sup>8</sup> The new inhalers produce the same particle size as the old inhalers and the particles are deposited inside the lung in a similar way.<sup>8</sup> HFA suspensions are equally effective as CFC formulations when the same dose is taken.<sup>8-11</sup>

The HFA solutions (beclomethasone dipropionate, flunisolide) produce very small particles. These penetrate the small airways in the lung better than the older CFC formulation of the same medicine.<sup>8</sup> Therefore, smaller doses are used.<sup>8,12-14</sup> Pharmacology studies show that it is necessary to reduce the dose to minimise the amount of medicine entering the bloodstream from the lung.<sup>15</sup>

### Other inhaled medicines

Clinical trials show that HFA inhalers are equally effective as CFC inhalers for salmeterol<sup>16</sup> and cromolyn sodium<sup>17</sup> in patients with asthma, and for ipratropium bromide in patients with COPD.<sup>18,19</sup>

## Safety of CFC-free pressurised metered-dose inhalers

The International Pharmaceutical Aerosol Consortium<sup>†</sup> has conducted an extensive safety program since 1990. Toxicology studies showed that the HFAs are equally safe for patients as CFCs.<sup>3</sup>

### Asthma

Clinical trials show that HFA inhalers are as safe as CFC-containing inhalers when used with salbutamol,<sup>5,6,20</sup> fenoterol,<sup>7</sup> inhaled corticosteroids<sup>8-10</sup> and cromolyn sodium.<sup>17</sup>

### COPD

Clinical trials of ipratropium in patients with COPD show that HFA inhalers are as safe for patients as CFC inhalers.<sup>18,19,21</sup>

\*Some medicines mentioned are not available in all countries.

†For more information about how to use inhalers correctly, see National Asthma Council Australia ([www.NationalAsthma.org.au](http://www.NationalAsthma.org.au))<sup>1</sup>

## Differences between CFC-containing and CFC-free pressurised metered-dose inhalers

Some CFC-free pressurised metered-dose inhalers produce particles that travel slower than with CFC-containing inhalers.<sup>3</sup> This can make it easier for patients to inhale at the right time while activating the inhaler.<sup>3</sup>

For some CFC-free pressurised metered-dose inhalers, the spray is warmer and less forceful, so it may reduce the risk of patients holding their breath when they feel the cold spray.<sup>3</sup>

When changing from an older CFC-containing inhaler to a CFC-free inhaler, some patients may be worried that the medicine is not the same because it feels, sounds, smells or tastes different. Doctors, nurses and pharmacists should reassure patients that it is still the same medicine and is as effective. They should also ensure that patients understand how to clean and care for their inhaler.

Some HFA metered-dose inhalers contain very small amounts of alcohol in the propellant to make the inhaler work effectively. People who avoid alcohol for religious or other reasons may be concerned about using these inhalers. Doctors should explain that the amount of alcohol per dose (puff) is too small to affect health.<sup>22</sup> The use of medicines that contain alcohol is commonly permitted by many religious authorities.† Patients may wish to consult their own religious institutions for confirmation.

Some CFC-free inhalers for nedocromil sodium and sodium cromoglycate can become blocked, because the new propellants make the medicine stickier. To prevent the inhaler blocking, patients must wash the plastic holder frequently. Patients should follow the instructions in the pack carefully. The main steps are:

1. Take out the metal canister
2. Wash the plastic holder under warm running water through both ends
3. Shake off the excess water and leave it to dry thoroughly
4. When the plastic holder is dry, replace the canister.

Some inhalers include two plastic holders, so that patients can use one while the other is drying.

## Caring for patients while they change to a different inhaler

When patients stop using their old inhalers and start using the new inhalers, doctors and other health workers have an important opportunity to check each person's health and adjust the treatment. The consultation should include these steps:

- Consider all the treatment options that might be suitable for each patient, including different types of inhalers and oral medicines.
- For patients with asthma, check whether asthma is well controlled. Adjust medicines if necessary.
- Check if patients have been taking their medicine properly. If they do not always take long-term medicines that have been prescribed, find out why not and encourage them to keep taking it.
- Explain how to use the inhaler properly. Check that the patient understands and ask them to show you how they take the medicine. Even if you have previously shown the person how to use their inhaler, they need to be shown again regularly.<sup>1</sup>

Avoid prescribing CFC-containing inhalers for patients starting an inhaled medication for the first time. The inhaler may become unavailable.

### Important information for your patients

Explain that the changes to inhaled medicines are because of an international agreement that is intended to stop more damage to the Earth's ozone layer. The CFCs in medicines are not harmful to patients.

If a patient must change to a new inhaler (CFC-free metered-dose inhaler or dry-powder inhaler):

- Explain carefully the correct way to use the inhaler.
- Make sure they understand the correct dose. If it has changed, explain why.
- Explain that the medicine might feel or taste different and the inhaler might work differently. Explain what to expect.
- Reassure them that the new medicine is as effective and safe as their old medicine.
- Make sure they know how to wash and care for their inhaler.

For patients changing to a CFC-free metered-dose inhaler, explain that these inhalers have been carefully developed and have already been used by many patients over several years in many countries.

- Ask patients to tell a doctor, nurse or pharmacist if they have any problems with their inhaler or their symptoms.

†Members of International Pharmaceutical Aerosol Consortium are AstraZeneca, Abbott, Boehringer Ingelheim, Chiesi Farmaceutici, GlaxoSmithKline, Inyx, Inc and Sepracor.

‡See Fatwa Emdadul volume 4, page 209; Fatwa Rahimia volume 6, page 277; Fatwa Mahmudia volume 15, page 399.

**Table 1.** CFC-free inhalers available in Asia & the Pacific region\*

Medication	CFC-free pressurised metered-dose inhalers	Dry-powder inhalers
Short-acting beta <sub>2</sub> agonists	Salbutamol sulphate (Azmasol HFA, Ventolin, Ventolin Evohaler)	Salbutamol sulphate (Ventolin Accuhaler, Ventolin Rotadisk, Ventolin, Rotacaps) Terbutaline (Bricanyl)
Inhaled corticosteroids	Beclomethasone dipropionate (Clenil, Decomit HFA) Fluticasone propionate (Flixotide)	Beclomethasone dipropionate (Becotide, Becotide Rotadisk) Budesonide (Pulmicort) Fluticasone propionate (Flixotide Accuhaler, Flixotide Rotadisk)
Long-acting beta <sub>2</sub> agonists	Salmeterol xinafoate (Serevent)	Formoterol (Oxis) Salmeterol xinafoate (Serevent Accuhaler, Serevent Rotadisk)
Combinations	Fluticasone propionate and salmeterol xinafoate (Seretide, Seretide Evohaler)	Budesonide and formoterol (Symbicort) Fluticasone propionate and salmeterol xinafoate (Salflu Rotacap, Seretide, Seretide Accuhaler, Ticamet Cozycap)
Anti-cholinergics		Tiotropium (Spiriva)

Source: International Pharmaceuticals Aerosol Consortium (updated 2008)

\*Products registered in selected countries including Bangladesh, China, India, Iran and Pakistan. Other CFC-free products may also be available.

Medicines are listed as Generic name (Brand name).

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## Where to get more information

### International resources

Global Initiative for Asthma:  
<http://www.ginasthma.com>

Global Initiative for Chronic Obstructive Lung Disease:  
<http://www.goldcopd.com>

International Pharmaceutical Aerosol Consortium:  
<http://www.ipacmdi.com>

National Asthma Council Australia:  
<http://www.nationalasthma.org.au>

United Nations Environment Programme:  
<http://www.unep.fr/ozonAction>

United Nations Development Programme:  
<http://www.undp.org/chemicals/montrealprotocol.htm>

United Nations Industrial Development Organisation:  
<http://www.unido.org/index.php?id=o18265>

The World Bank:  
<http://www.go.worldbank.org/KXM814CLAO>



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