Australian Government
Department of Veterans' Affairs

Veterans'MATES

Therapeutic brief 6

Inhaled respiratory medicines: optimising use in COPD

The management of veterans with chronic obstructive pulmonary disease (COPD) often requires the use of several inhaled medicines presented in various types of inhaler devices. In addition, COPD may overlap with asthma, increasing the potential for the use of multiple respiratory medicine devices. A number of recently published guidelines, including COPDX[1] and GOLD[2] have addressed the overall management of COPD. This therapeutic brief focuses on optimising the use of respiratory medicines and ensuring good compliance and inhaler technique for your veteran patients.

Inside

To optimise quality of life for your patients with COPD, consider:

- selection of the most appropriate inhaled medicine with subsequent review, 'step-down' or ceasing when appropriate
- selection of the most appropriate inhaler device for drug delivery
- education of patients to promote optimal use of their devices
- interventions such as smoking cessation, pulmonary rehabilitation programs and immunisation.

Complex medication regimens have the potential to cause problems in administration and compliance for the patient.

Maximising the clinical effectiveness and minimising the adverse effects of inhaled medicine depend on good compliance and technique.

In the twelve months from September 2004 approximately 70,000 (1 in 5) veterans were dispensed at least one respiratory medicine for COPD or asthma.[3] Over 45% of these veterans were dispensed two or more distinct types of inhaler devices.[3]

Key Points

- Bronchodilators (beta-agonists and anticholinergics) are the mainstay of the pharmacologic management of COPD.
- Selecting the most appropriate inhaled medicine for your veteran requires consideration of:
  - severity of disease,
  - patient ability to use inhaler devices,
  - impact on quality of life,
  - patient preference including previous experiences with inhaled medicines.
- The clinical effectiveness of inhaled medicines should be reviewed within 2-3 months of commencement. If there are no improvements in relevant parameters eg symptoms, lung function (as measured by spirometry) or functional status, the medicines should be stepped-down or ceased.
- Poor inhaler technique is a common problem. Concurrent use of multiple respiratory devices may further compromise technique and reduce compliance.
- Check that the patient has the correct inhaler technique at least every 12 months and at each acute exacerbation.
- Home Medicines Reviews (HMRs) can be used to review inhaler technique and ensure the patient understands their action plan for the management of acute exacerbations of COPD.

2 Selection of the most appropriate medicine

Beta-agonist and anticholinergic bronchodilators are first-line therapy in COPD. Bronchodilators do not slow the progression of COPD and are primarily used to improve symptoms, exercise tolerance and quality of life. Table 1 shows the COPDX[1] classification of disease severity and suggests initial treatment with short-acting bronchodilators. However, FEV1 correlates poorly with symptoms and treatment with bronchodilators is usually driven by functional assessment rather than spirometric results.

Table 1: Initial treatment with short-acting bronchodilators.[1]

Severity of COPD	FEV_1	Suggested treatment
Mild	60-80%	Intermittent bronchodilator – salbutamol (2 puffs x 100µg) or ipratropium bromide (2 puffs x 20 µg) prior to exercise as needed.
Moderate	40-59%	Intermittent or regular bronchodilator – salbutamol (2 to 4 puffs x 100 µg qid) or ipratropium bromide (2 puffs x 20 µg qid). Combination bronchodilators may be considered (eg Combivent®).
Severe	<40%	Regular combined bronchodilator - salbutamol (2 to 4 puffs x 100 µg qid) and ipratropium bromide (2 to 4 puffs x 20 µg qid).

Many veteran patients will already have moderate to severe COPD, and in this group regular treatment with long-acting bronchodilators may be more effective and is more convenient than treatment with the short-acting preparations.[2, 4]

Despite a lack of large, long-term studies examining the use of tiotropium in combination with long acting beta2-agonists (LABAs),[5,6] these agents work by different mechanisms and guidelines advocate combined bronchodilator therapy for patients who do not respond satisfactorily to initial monotherapy.[1,2]

There is conflicting evidence regarding the efficacy of inhaled corticosteroids (ICS) to slow decline in lung function.[7] There is some evidence that long-acting bronchodilators and ICS can reduce exacerbation rates in patients with moderate to severe COPD.[4,8-13]

In contrast to asthma, ICS should not be used as a first-line medicine in patients with COPD.

The inflammatory process in COPD (neutrophil dominant) is different from that of asthma (mast cell, eosinophil dominant). This difference explains why ICS provide much better symptom relief and improvement in FEV1 in asthma than in COPD. In COPD, ICS should be considered in patients:

- with a documented positive response (symptoms or FEV1) during a 2-3 month trial of use; or
- in patients who have severe COPD with frequent exacerbations (› 2 per year).[1,4]

There is mounting evidence that a short course of oral glucocorticosteroids is a poor predictor of the long-term response to inhaled glucocorticosteroids in COPD.[2,4] A trial of ICS is warranted even if a patient has not previously responded to oral therapy.

Review, step-down or cease

The clinical effectiveness of each inhaled medicine should be reviewed within 2 to 3 months of commencement.

Check compliance and inhaler technique. Consider ceasing the medicine if there is no improvement of symptoms, functional status, or lung function (as measured by spirometry).

Optimising inhaler technique

Veterans need to be provided with the knowledge and skills to use their inhaler devices safely and effectively.

It is estimated that up to 70% of patients have poor inhaler technique.[5] This results in sub-optimal delivery of medicine.[14]

The veteran community is particularly vulnerable to problems with medicines, as many veterans have poor eyesight, tremor, and coordination difficulties. In addition, cognitive impairment may compromise a patient's ability to effectively use an inhaler device.[1,4]

Many veterans are dispensed multiple respiratory devices concurrently. This may add to the problems experienced by veterans in administration and compliance with their medicine.

When possible, multiple device types should not be used for an individual patient.

Training the patient using the relevant package insert *plus* physical demonstration significantly improves patient technique.[15]

The patient should demonstrate appropriate technique to the doctor/pharmacist at the time of consultation.

Inhaler technique may begin to decline two months after patient education.[5] Therefore, it is important to reinforce correct technique when the patient is reviewed.

A yearly medication review presents an opportunity to critically assess inhaler technique. This should be supplemented by additional review at each medical consultation and at the time of any acute exacerbation or evidence of disease destabilisation.

HMRs are an effective means of educating veterans in the use of their respiratory medicine devices and should be considered for all patients.

For recommendations and counselling tips for individual inhaler devices please refer to Table 2 (separate insert).

Acute exacerbations of COPD

Good inhaler technique and compliance is an essential element in reducing exacerbations.

Exacerbations of COPD cause:[16,17]

- accelerated deterioration in lung function,
- increased morbidity and progressive loss of independence,
- increased mortality rates,
- hospitalisation.

Reducing frequency of exacerbations

There is some evidence that both long-acting bronchodilators and inhaled corticosteroids, either alone or together, reduce exacerbations in patients with moderate to severe COPD.[4,8-13]

Combination therapy with inhaled corticosteroids and LABAs show significant effects on the prevention of acute exacerbations. Emerging data are expected to clarify the role of ICS in the management of patients with COPD of different severities, as well as the place of treatment with ICS/LABA combinations.[18]

Immunisation

Immunisation against influenza and pneumococcal pneumonia is recommended to reduce acute exacerbations of COPD.[2,4,11]

Antibiotics

Current evidence does not support long-term antibiotic use to prevent exacerbations in patients with COPD. However, they should be used in exacerbations with an increase in cough, dyspnoea, sputum volume or purulence.[1]

Oral corticosteroids

The use of oral corticosteroids in the treatment of exacerbations of COPD is well established. However, long-term treatment with oral glucocorticosteroids should be avoided because of an unfavourable benefit-to-risk ratio.[2]

4 Smoking cessation

Immediate implementation of an effective smoking cessation program is essential for the successful management of COPD.[4,19]

Visit www.quit.org.au

Smoking cessation is the only intervention shown to slow the deterioration in lung function.[20-22] No medicine has been conclusively shown to slow the progression of COPD.

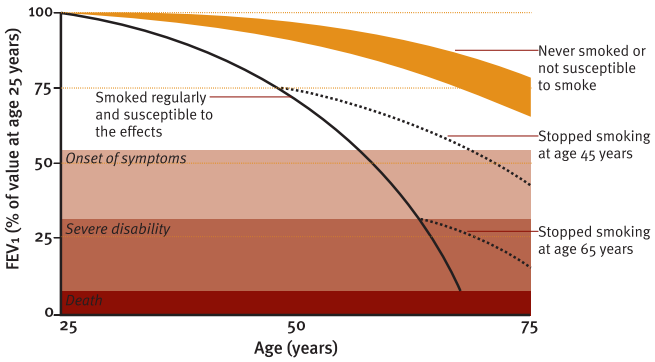

Figure reproduced from COPDX guidelines[2]

Smoking cessation or a significant decrease in smoking does not lead to recovery of lung function; however, it does cause the accelerated annual rate of decline in FEV1 to revert toward that of a non-smoking subject and it reduces mortality.[23] The beneficial effects of smoking cessation in slowing the decline in lung function and the progression of disease have been clearly established.[24]

For more information regarding COPD and its treatment go to:

- www.copdx.org.au
- www.lungnet.org.au
- www.webmd.com/lung/copd/gold-criteria-for-copd

Other interventions

All patients with COPD should consider being immunised against influenza and pneumococcal-related infections to reduce the frequency of acute exacerbations.

Ensure patients understand that at different times they may require different medicines to manage their COPD. All patients should have an action plan for management of acute exacerbations.

Pulmonary rehabilitation plus long term maintenance exercise programs and optimised medical treatment can lead to significant reductions in the frequency of acute exacerbations, hospitalisations, and premature mortality.[23] Comprehensive programs incorporating exercise, education, smoking cessation, nutritional counselling, and psychosocial support provide the greatest benefit.

What to tell your patient

To regularly check their inhaler technique with you and their pharmacist.

To know when their inhaler needs replacing and how best to store the medicine.

HMRs can help them get the best results from their inhalers.

To seek help early if they are feeling worse. Early intervention may reduce the need for hospitalisation.

To stop smoking as it is the only intervention that will slow the progression of the disease.

To develop an exercise and nutrition program, together with their health care team.

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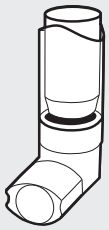
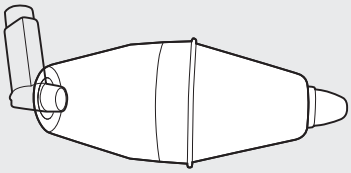
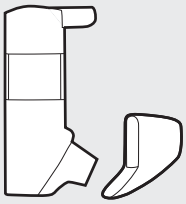
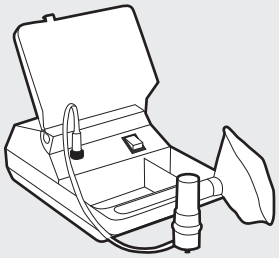
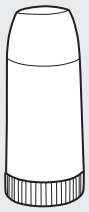
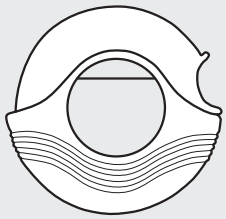
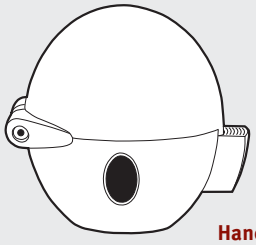
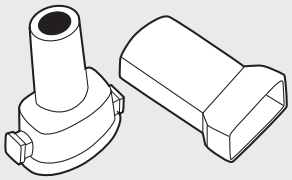
Table 2: Inhaler devices used in COPD†

The prescriber must certify that the patient satisfies criteria set out in the Schedule of Pharmaceutical Benefits and that the use is in accordance with the registered indications which may differ between agents.

Device type	Considerations	Recommendations	Counselling tips
Metered dose inhalers (MDIs) Eg: Alvesco®, Asmol®, Atrovent® and Atrovent Forte®, Combivent®, Epaq®, Flixotide®, Qvar®, Seretide®, Ventolin®	Provide quick delivery of medicine however require good hand-breath co-ordination.[1] 	Not for patients with poor dexterity. Require intensive counselling by doctor and pharmacist at regular intervals to ensure optimal technique.[2]	• Ask patient to demonstrate technique regularly (every 2 to 3 months) or ask patient to check technique with pharmacist at each dispensing. • If patient is experiencing difficulties suggest the use of a spacer. • Educate patient on how to estimate what quantity of medicine is left in the canister. • Ensure patient regularly cleans plastic outer to prevent blockages.
Spacers Eg: Volumatic, Breath-a-tec, Aerochamber, Fisonair, Nebuhaler	For use with MDIs. Improve pulmonary deposition pattern of medicine. Reduce oropharyngeal deposition of medicines and thus reduce systemic absorption, incidence of oral candiasis and dysphonia. Reduced likelihood of triggering cough reflex with MDIs alone.[3] 	Useful for adults with poor hand-breath co-ordination.[2] When compared to nebulisers, spacers are cheaper, easier to clean and more portable.[3] Large volume spacers are more efficient that small volume spacers however, are more bulky to carry.[1]	• Educate patient to inhale dose of medicine immediately after actuation to minimise medicine deposition in the chamber. • Ensure patient delivers one actuation of MDI per inhalation. • Educate patient to wash the spacer in warm water and kitchen detergent and leave to drain (do not dry with cloth as increases electrostatic forces within chamber). The spacer should be washed at least once a month.
Autohalers Eg: Airomir®, Qvar®, Atrovent®, Respocort®	Require less hand-breath co-ordination than MDIs as delivery of medicine is breath actuated.[1] 	Alternative for those patients experiencing difficulties with MDIs and not wanting to use a spacer.	• Educate patient to use same inhalation technique as with MDIs (breathe in slowly and hold breath for 5 seconds).
Nebulisers A variety of devices are available, ranging from electronic to nebulisers with 12V pumps that plug into car cigarette lighters.	Delivery of medicine by nebuliser is no more effective than a MDI and spacer. Nebulised medicines are associated with unwanted effects such as paradoxical bronchoconstriction, glaucoma, dry mouth and urinary retention.[2] Users may experience skin and eye irritation. 	Only for those patients who are unable to use a MDI +/- spacer or a DPI. Restrict home use of nebulisers to specialised cases. Recommend mouthpiece instead of mask to avoid skin and eye irritation.	• Ensure patient understands and has the ability to undertake the strict hygiene and maintenance regimens required for nebulisers. • Alert patient that nebulisers are more costly than other delivery devices.

Device type	Considerations	Recommendations	Counselling tips
Dry powder inhalers (DPIs)	Require less hand-breath co-ordination than MDIs. Require higher inhalation flow rate than MDIs and are not as effective as MDIs in acute exacerbations. Many of these devices have dose counters.	Useful for patients who are unable to co-ordinate hand-breath technique with MDIs. May be inappropriate for patients with severe airflow obstruction.[2]	• Educate patient to rinse mouth and throat after use to minimise systemic absorption and likelihood of dental caries.[1,2] • Ensure patients hold their breath for at least five seconds directly after inhalation of medicine.
Turbuhaler® Eg: Bricanyl®, Pulmicort®, Symbicort®, and Oxis®	Breath-activated delivery of medicine without the need to co-ordinate inspiration and drug release. 	Useful for patients who are unable to co-ordinate hand-breath technique with MDIs. May be inappropriate for patients with severe airflow obstruction.[2]	• Ensure patient holds the device upright (›45 degrees) during priming of device. • Ensure patient does not breathe into the device or expose the medicine to moisture. • Alert patient to dose counter or red mark indicating remaining doses.
Accuhaler® Eg: Flixotide®, Seretide® and Serevent®	Gives accurate and consistent drug delivery over 30-120L/min inspiratory flow rate. 	Useful for patients who are unable to co-ordinate hand-breath technique with MDIs. May be inappropriate for patients with severe airflow obstruction.[2]	• Ensure patient does not breathe into the device or expose the medicine to moisture. • Alert patient to dose counter indicating remaining doses.
Aerolizer® and Handihaler® Eg: Foradile Aerolizer® and Spiriva Handihaler® Two distinct device types with similar recommendations	Require the patient to insert a capsule into the device prior to each dose being inhaled. In April 2005, the FDA released a warning to alert health professionals to the potential for inadvertent oral administration of the capsules.[4] Swallowing the capsules instead of inhaling the contents will reduce the efficacy of the medicine.[4]  **Handihaler®**	Pharmacists should clearly label the capsule outer package with cautionary and advisory label 22 or "Use only with approved/ recommended device (capsules for inhalation)."[5]	• Counsel patient to administer each capsule into the device immediately prior to EACH dose being inhaled. • Ensure patient stores the device and capsules away from oral medicines to avoid confusion. • Ensure patient knows NOT to expose capsules to air and moisture as they may render the medicines ineffective.  **Aerolizer®**

* Spinhalers® and Rotahalers® are not commonly used in the veteran population. They are two distinct single-dose devices which require the patient to insert each dose of medicine into the device. For more information on each of these devices, refer to the Consumer Medicines Information leaflet provided by the manufacturers.

† Content of table is accurate at time of printing.

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