

# THE NZ JOURNAL OF RESPIRATORY HEALTH

APRIL 2016



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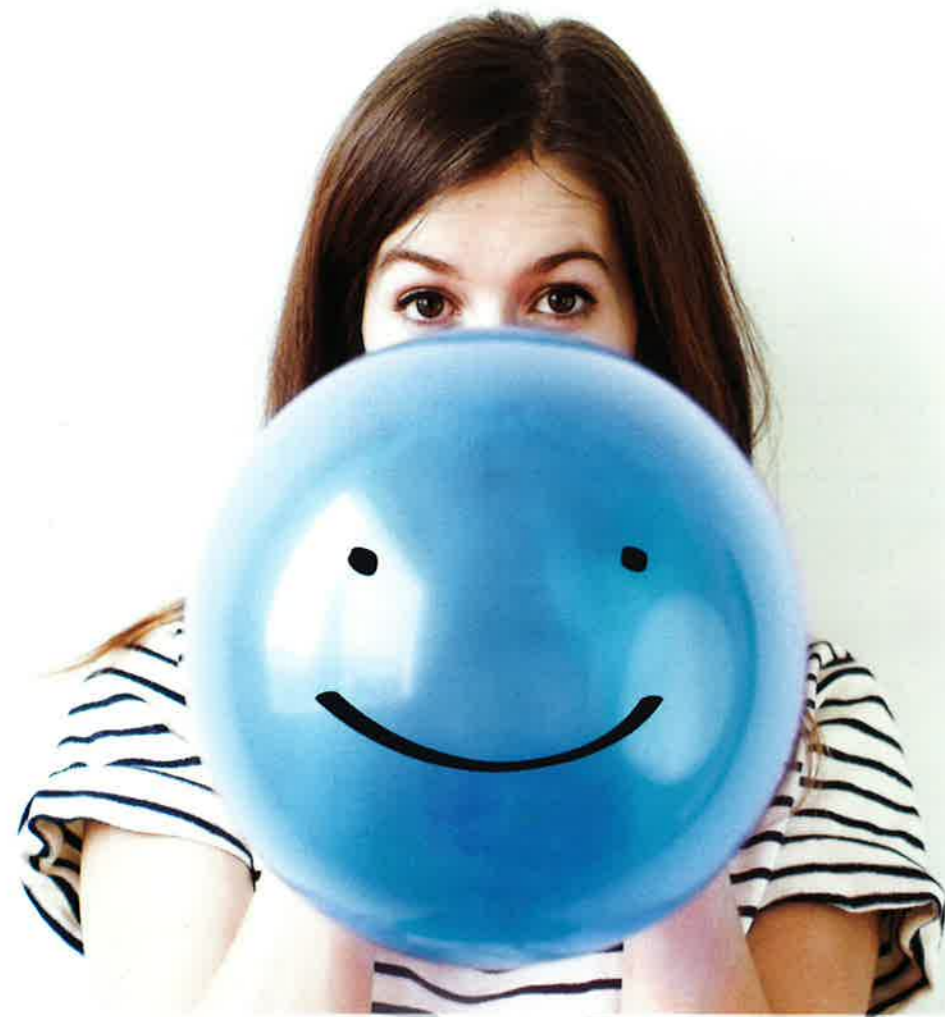
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References: 1. Ventolin Data Sheet, GSK New Zealand.

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THE NZ JOURNAL OF RESPIRATORY HEALTH



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ISSN 1176-7847

**PUBLISHER**  
Asthma New Zealand  
– The Lung Association  
581 Mt Eden Road, Mt Eden  
Auckland 1024  
PO Box 67066  
Mt Eden, Auckland 1349

**CONTACT**  
Phone: 09 623 0236  
Fax: 09 623 0774  
Email: [anz@asthma.org.nz](mailto:anz@asthma.org.nz)

**PRODUCTION & ADVERTISING**  
Asthma New Zealand  
Editor: Linda Thompson  
Email: [editor@asthma.org.nz](mailto:editor@asthma.org.nz)



**ON THE COVER**  
Have you asked your doctor if you or your child are eligible for a free flu vaccine?



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## DISTANCE LEARNING ASTHMA/COPD NURSING COURSE INFORMATION

Applications are now invited from registered nurses wanting to enrol in the Asthma New Zealand/Unitec Institute of Technology Asthma Nursing Course for July 2016 and COPD Nursing Course for April 2016. The programmes are offered by distance learning. Not everyone has the same pace of learning. Some students pick up things fast, others need time to grasp a concept. One of the biggest advantages of distance learning is that you can study at a pace that is comfortable for you. The primary aim of the Asthma and COPD Nursing Courses is to provide nursing health professionals with a high level of evidence-based asthma and COPD knowledge that promotes best practice and is consistent with national policy.

Since the commencement of the Asthma and COPD Nursing Courses, 1,050 nurses have enrolled in these courses. Many applicants had not undertaken any additional study since completing their nursing training, which may have been years before. However, most find the courses to be a challenging but thoroughly enjoyable learning experience that is within the grasp of any competent nurse practitioner.

Asthma New Zealand in association with Unitec Institute of Technology offers these courses within the Bachelor of Nursing Programme. Both courses are a level 7 course and attract 15 credits. **A grant towards the cost is available for registered nurses from Asthma New Zealand.**

For information contact: Ann/Swarna  
Asthma New Zealand – the Lung Association  
PO Box 67066, Mt Eden, Auckland  
Phone 09 623 4777 Ann or 09 623 4771 Swarna  
Fax 09 623 0774  
Email [annw@asthma.org.nz](mailto:annw@asthma.org.nz)  
[swarnah@asthma.org.nz](mailto:swarnah@asthma.org.nz)

The closing date for enrolment is  
8th July 2016 for Asthma Nursing Course  
20th April 2016 for COPD Nursing Course

## Upcoming events and courses

### ASTHMA NEAT COURSE – AUCKLAND

15 June 2016  
21 September

### HALF DAY COPD COURSE – AUCKLAND

20 April 2016  
19 July 2016  
19 October 2016



## WORLD ASTHMA DAY



3rd May 2016

Further enquiries for any of these events phone **09 630 2293** or [www.asthma.org.nz](http://www.asthma.org.nz)



## MESSAGE TO READERS

**The Government has announced plans to strengthen residential tenancy laws; which is great all round but in particular for people with asthma, COPD and other respiratory conditions. To be honest it's about time. Not quite the WOF we were hoping for but a great start.**

From 1 July 2016 all landlords will be required to state in tenancy agreements the level of ceiling, underfloor and wall insulation and to make sure there are working smoke alarms inside properties. Tenants will be responsible for replacing batteries and advising the landlord of any defects.

The new law will require retrofitting of ceiling and underfloor insulation in rental homes over the next four years.

The requirement would apply from July for Government-subsidised social housing, and from July 2019 for all other rentals including boarding houses.

There would be some exceptions, such as in houses where it was physically impossible to retrofit insulation.

These changes will make homes warmer, drier and safer for hundreds of thousands of New Zealand families without imposing any excessive cost to landlords.

The health benefits of this will be reduced hospitalisations from respiratory illnesses, reduced pharmaceutical costs, and fewer days off work and school.

In addition to insulation Asthma New Zealand recommends to have a well ventilated, warm home and can recommend the following "breathe easy" suppliers to do just that!

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- A **DVS® Ventilation System** will remove stale, moisture-laden air from your home, replacing it with fresh, filtered air. [www.dvs.co.nz/solutions/ventilation](http://www.dvs.co.nz/solutions/ventilation)
- **Heat Pumps** are the most energy efficient form of heating, and **Fujitsu** has the most efficient range in New Zealand. [www.fujitsugeneral.co.nz](http://www.fujitsugeneral.co.nz)

Have a safe and warm winter.

**Linda Thompson**  
Executive Director  
Asthma New Zealand



Heart of a Healthy Home™



# EXERCISE INDUCED BRONCHOCONSTRICTION

By Ann Wheat RN  
Asthma Nurse Educator

**Exercise is one of the most important activities an individual can undertake. It ensures that the body remains fit, strong and healthy. A healthy body is one of the best defences against disease.<sup>1</sup> It is really important therefore, that everyone, including those with asthma, should continue to exercise.**

## What is Exercise Induced Bronchoconstriction (EIB)

EIB, or as it was once called exercise-induced asthma, is where the muscles of the airways in the lungs constrict and cause airflow obstruction.<sup>1</sup> For people with asthma, up to 90 percent will experience symptoms of EIB during or shortly after exercise.<sup>1</sup> This includes people who may only exercise occasionally to professional athletes.<sup>2</sup> In teenagers and young adults, this may be the most common trigger of asthma symptoms. It is also known that people who do not have asthma can also have EIB and this may be as high as 20 percent of people without asthma.<sup>3</sup>

## What Causes EIB?

EIB is thought to happen when cooler, drier air enters the airways causing loss of heat and moisture from the airways.<sup>2</sup> During strenuous activity people tend to breathe through their mouths thus allowing cooler and drier air directly into the lungs. The nose helps to warm and saturate the air to about 80 – 90 percent humidity as against mouth breathing of only 60 – 70 percent relative humidity.<sup>2</sup> It is this cooler, drier air that causes bronchoconstriction (airway narrowing).<sup>1</sup> Airway bronchoconstriction can occur shortly after exercise commences and after exercise is completed, and may last for up to 30 minutes if left untreated.<sup>2,4</sup> EIB severity is usually mild to moderate but occasionally can be life threatening.<sup>3</sup>

Other factors are also implicated in EIB; these include air pollution, high pollen counts, some environmental factors such as swimming pools (chlorine), ice rinks or snow sports, respiratory infections and a recent asthma episode.<sup>2,3,4</sup>

## What are the symptoms of EIB?

The typical symptoms of EIB include coughing, wheezing, shortness of breath and chest tightness.<sup>5</sup> These symptoms are the same as in asthma. Several other atypical symptoms can also occur including fatigue, feeling out of shape, feeling unable to keep up with other and avoidance of activity.<sup>4,5</sup>

## How is EIB diagnosed?

EIB is usually not diagnosed by symptoms alone so for professional athletes, people with asthma or people who may only have EIB one of the first tests undertaken will be spirometry. This will evaluate how well the lungs are working when a person is not exercising. The main results tested for include FEV1 (forced expiratory volume in 1 second), FVC (forced vital capacity) and FEV1/FVC ratio (see article on spirometry). This may be followed by a reversibility test or even an exercise challenge test to see if there is a drop in FEV1 after exercise. This also allows for the observation of symptoms during and after the challenge test.<sup>4</sup> The challenge test can be carried out in both the laboratory on a treadmill or other stationary exercise equipment or real-life challenge (especially for professional athletes) either at the site of their sport or climbing stairs.<sup>4,5</sup>



Several other challenge tests can be carried out such as methacholine challenge, eucapnic voluntary hyperventilation (EVH) challenge or Mannitol challenge. The methacholine challenge test uses an inhaled agent that interacts with certain smooth muscle cells causing bronchoconstriction.<sup>4</sup> The EVH challenge is where a person inhales a mixture of dry air composed of oxygen, carbon dioxide and nitrogen that stimulates the exchange of air when breathing is difficult.<sup>4</sup> The test is positive if there is a 10 percent drop in FEV1 within 20 minutes of the test.<sup>6</sup> The Mannitol challenge test is where a person inhales a dry powder that can trigger water loss on the surface of the airway switching on the molecular activity that controls inflammation. These are the conditions that cause bronchoconstriction in sensitive people.<sup>4</sup>

## How is EIB treated?

Depending on whether the person has asthma, is a professional athlete, or just has EIB alone will depend on how the condition is treated.

In asthma, a person with EIB should have well controlled asthma. This includes twice daily use of a preventer medication and use of a short acting beta2 agonist (SABA) less than twice a week. If a person is using a SABA for exercise more than twice weekly and is compliant with their preventer medication, then a long acting beta2 agonist (LABA) could be added to the treatment regime. If a person continues to have problems with exercise then a leukotriene receptor antagonist can be used daily as add-on therapy.<sup>3</sup> It is recommended that 2 puffs of reliever medication can be used 10 – 20 minutes prior to exercise but again if a person is exercising most days and using a reliever prior to exercise then they are using too much.

Professional athletes must be aware of what they are allowed to use when competing and the medications must be disclosed before competition. Oral beta2 agonists should not be used for the treatment of EIB in athletes. Inhaled beta2

agonists can be used to a maximum dose of salbutamol 1600mcg in 24 hours, formoterol less than 54mcgs in 24 hours and salmeterol can be used as per the manufacturer's instruction.<sup>7</sup> If beta2 agonists are needed frequently then other medications such as leukotriene receptor antagonists, mast cell stabilizers, inhaled corticosteroids with or without LABAs can be added to the treatment regime.<sup>5</sup>

For people who only have EIB the use of a SABA is recommended prior to exercise. However, if they need to use this daily or continue to have symptoms despite SABA use, then a doctor's review should be undertaken to identify if further medication is required.<sup>3</sup>

## What else can be undertaken to assist in the management of EIB?

- Warming up is important prior to exercise. This should be for at least 10 minutes. Warming up helps to reduce bronchoconstriction.<sup>5</sup>
- Breathing through the nose helps to warm and humidify the air.<sup>4</sup>
- In cold weather it is essential to cover the nose and mouth with either a scarf or mask. This will help to reduce the symptoms of EIB.<sup>4</sup>
- Reducing the intake of sodium is thought to help reduce bronchoconstriction after exercise but further research is needed.<sup>5</sup>
- Exercising indoors may also help to reduce the effects of EIB especially when the air is cold outside. This is because warm air holds more humidity.<sup>8</sup>

- Try to avoid known triggers especially when pollen counts are high.<sup>4</sup>
- Avoid strenuous exercise when a person has a cold or respiratory infection.<sup>4</sup>

**In conclusion**, EIB can cause quite a disruption to the lives of people who have this condition. There is one inescapable fact that exercise is very important to maintain fitness and good respiratory health so it is essential to continue even though one has EIB.

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FIT A FUJITSU

## DEAR NURSE



### Dear Nurse, my grandmother is very short of breath and I think she needs some oxygen. How can I get some for her to use at home?

Dear reader, Oxygen is prescribed by doctors or specialists for people who have a low level of oxygen in their blood and not for people who are short of breath. It can be dangerous if it is not properly prescribed. A special blood test is needed to measure the level of oxygen in her blood. She will also need to have some lung function tests carried out. Please take your grandmother to her doctor for an assessment.

### Dear Nurse, I have had COPD for over 5 years and my friend who has asthma told me that I should be using a peak flow meter to measure how well my lungs are working. Is this true?

Dear reader, Peak flow meters are a useful tool for people with asthma as the narrowing of the airways can come on quite rapidly. The obstruction in the airways is a different process in COPD where you often get air trapping, excess mucous production and recurrent infection. The current global COPD guidelines do not include the use of peak flow meters to self-monitor your COPD. The focus is more on the frequency and severity of your symptoms, such as breathlessness, sputum production and coughing, and also the number of exacerbations and hospital admissions. Of course, measurements of lung function are important but these are usually done with spirometry by your health practitioner. Sometimes, they will use a peak flow meter to get a snapshot of your lung function at the time but as a rule,

it's not something that you need to carry out at home on an ongoing basis.

Reference: 1. [http://www.goldcopd.org/uploads/users/files/GOLD\\_Pocket\\_2015\\_Feb18.pdf](http://www.goldcopd.org/uploads/users/files/GOLD_Pocket_2015_Feb18.pdf)

### Dear Nurse, How do I tell if my inhalers are empty?

Dear reader, the best way is to keep track of your inhaler use. Easy enough when you take one or two puffs twice a day and by simple maths you can work out how long it will take you to use up the doses in the canister. You can write the start date or finish date on the canister.

Not so easy for your reliever that you are not using on a regular basis. Shaking your inhaler is the only way to assess if it still has some left inside. However, this is not always accurate as the canister contains both propellant and medication, and the medication always runs out before the propellant. For this reason, if the canister feels light, throw it away.

Because of the uncertainty about the amount of medication in the inhaler, and whether there is enough medication to resolve an asthma attack, you should always have a spare inhaler available.

**IF YOU HAVE A QUESTION PLEASE EMAIL OR POST TO:**  
[editor@asthma.org.nz](mailto:editor@asthma.org.nz) or Dear Nurse, Asthma  
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# NZ's Home Comfort Specialist

The Home Comfort Specialist



# ASTHMA AND OLDER ADULTS

By Elaine Murray  
Asthma Nurse Educator

**Asthma is a disease of the airways, the small tubes which carry air in and out of the lungs. When exposed to certain asthma triggers (such as cold air, exercise, pollen and viruses), the sensitive airways react and become red and swollen, excess mucous is produced and the airway muscles tighten making the airways narrow causing the symptoms of breathlessness, wheezing, coughing and tight chest.**

Asthma is just as common in people aged 65 years or older as it is in all adults.

New cases of adult-onset asthma can occur at any age. Asthma is under-diagnosed and commonly misdiagnosed in older patients. The diagnosis is unrecognised in an estimated 50% of patients with asthma aged over 75 years.<sup>1</sup>

Lung function is measured by how well a person can fill their lungs with air, and how hard and fast they can breathe out. Lungs develop throughout childhood and early adulthood, reaching peak performance by about age 20 years in women and 25 years in men.

As a person ages, lung function slowly declines, resulting in both airflow obstruction and exercise limitation. Age-related changes lead to increased air trapping and a reduction in chest wall compliance, causing increased work of breathing.<sup>2</sup>

Ageing is also associated with immunological changes both systemically and in the lung, irrespective of the presence of disease. There is also neutrophilic inflammation present in the airways similar to that seen in patients with COPD and severe non-eosinophilic asthma. It is suggested that this inflammation might be related to the lifelong exposure to environmental stimuli such as air pollution, chemicals and fumes and tobacco smoke or possibly due to age-related changes to innate immunity.<sup>2</sup>

Always consider the possibility of adult-onset asthma in patients with dyspnoea, wheeze or cough, even when there has been no previous diagnosis of asthma, but remember there are also other possible causes of respiratory symptoms which include poor cardiopulmonary fitness, bronchiectasis, chronic obstructive pulmonary disease (COPD), hyperventilation, dysfunctional breathing pattern disorder, inhaled foreign body, large airway stenosis, pleural effusion, pulmonary fibrosis, rhinitis and upper airways dysfunction, cardiovascular disease, obesity, gastro-oesophageal reflux or lung cancer.<sup>3</sup>

**Asthma is more likely to explain the symptoms if any of these apply:**

- More than one of these:
  - Wheeze
  - Breathlessness
  - Chest tightness
  - Cough
  - Symptoms recurrent or seasonal
  - Symptoms worse at night or early in the morning
- History of allergies (allergic rhinitis, atopic dermatitis)
- Symptoms triggered by exercise, cold air, irritants, medicines (e.g. aspirin or beta blockers) allergies, viral infections, laughter

- Family history of asthma or allergies
- Symptoms began in childhood
- Widespread wheeze audible on chest auscultation
- FEV1 or PEF lower than predicted, without other explanation
- Eosinophilia or raised blood IgE level, without other explanation
- Symptoms rapidly relieved by a short acting bronchodilator, e.g. salbutamol.<sup>3</sup>

**Asthma is less likely to explain the symptoms if any of these apply:**

- Dizziness, light-headedness, peripheral tingling
- Isolated cough with no other respiratory symptoms
- Chronic sputum production
- No abnormalities on physical examination of chest when symptomatic
- Change in voice
- Symptoms only present during upper respiratory tract infections
- Heavy smoker (previous or current)
- Cardiovascular disease
- Normal spirometry or PEF when symptomatic.<sup>3</sup>

When assessing lung function to investigate asthma-like symptoms in adults, a spirometry test must be performed pre-and post-bronchodilator.

Airflow limitation is defined as reversible if **either** of the following applies:

- Baseline FEV1 > 1.7 L and post-bronchodilator FEV1 at least 12% higher than baseline
- Baseline FEV1 < 1.7L and post-bronchodilator FEV1 at least 200ml higher than baseline.<sup>4</sup>

Spirometry can also be used to assess and manage asthma control in response to treatment.

Asthma in older patients is common and is characterised by underdiagnosis and undertreatment. Ageing can be associated with many complex comorbidities and risk factors. Also, asthma may co-exist with chronic obstructive pulmonary disease known as asthma/ COPD overlap syndrome (ACOS).<sup>2</sup> Incomplete reversibility of airflow, (COPD) can frequently occur together with increased variability of airflow (asthma) in older patients with respiratory symptoms, and shows the frequent coexistence of asthma and COPD in older patients.<sup>2</sup>

Asthma in older adults is an increasingly serious health issue, and the number of older patients with asthma is said to rise in the next 20 years. Furthermore, the children who lived through the asthma epidemic of the 1980s are growing older and they will be 64 years and older by 2030, greatly

increasing the number of older patients with the disease.<sup>2</sup> Undertreatment of asthma remains an issue for older patients and the results from a study of emergency department presentations for asthma, showed that most older patients with acute asthma were not using maintenance inhaled corticosteroids.<sup>2</sup>

**There are some common comorbidities associated with both asthma and ageing:<sup>2</sup>**

## **Obesity**

Obesity is a pro-inflammatory state, associated with non-eosinophilic asthma. Obesity increases lung restriction, and increases the risk of hyper responsiveness, and is also associated with increased asthma severity and decreased response to treatment. In the younger patient with asthma, weight loss is encouraged but in the older patient it is important to consider specific nutritional needs. Also, as the older patient loses weight they will lose muscle tone so it is important that they include daily exercises.

## **Gastro-oesophageal reflux disease**

Co-existing asthma and gastro-oesophageal reflux disease occurs in up to 80% of older patients with asthma. If asthma is difficult to control and gastro-oesophageal reflux is present then it is suggested to treat with a proton-pump inhibitor, encourage weight loss and change diet.

## **Sleep disorders and obstructive sleep apnoea (OSA)**

A study reports that OSA was associated with nearly 7 times greater likelihood of severe asthma in an older patient. Diagnosed OSA increases the risk for worse asthma control in older patients, while continuous positive airway pressure (CPAP) therapy may have greater impact on asthma outcomes. Unrecognised OSA may be a reason for poor asthma control, particularly among older patients.

## **Depression**

Depression is associated with a higher risk of poor medication adherence and poor asthma outcomes, including more exacerbations.

## **Smoking**

Clinically, smoking is related to virtually every aspect of asthma control, including poor asthma-related quality of life, poor asthma control, more frequent exacerbations, hospital admissions and asthma-related mortality

## **Self-management of asthma**

Effective self-management relies on the patient's ability to understand their condition, monitor their symptoms, recognise worsening symptoms and know how to treat those symptoms by increasing medication and seeking medical help when necessary. For this to happen, the patient must have the knowledge, the skills, the confidence and ability to do this when needed. Central to self-management is a written plan of care, written in a way that the patient understands. The older patient may not have the ability to manage or understand asthma management due to cognitive status, poor eyesight, and poor hand strength or functioning due to arthritis.<sup>2</sup>

As an asthma nurse educator in the community, I am often told by the older patient that their appointments with the doctor are often rushed and that they did not receive enough information, and they may not see the practice nurse either, so they are often confused about when and how to use their inhalers.

An asthma nurse educator can provide a free asthma education session in their own home, away from the hospital or medical practice where they can be more at ease and able to listen without distractions. We will include their spouse or care giver when appropriate, or use an interpreter if English is a second language.

During this time we can take time to explain the pathophysiology of asthma in simple English (no medical jargon). We will explain the triggers and symptoms of asthma, the role of medications used for asthma and how to use the device correctly by firstly demonstrating how to use it then asking them to show you. Doctors should always ensure that they prescribe one type of inhaler device to avoid confusion.

If the patient has a metered dose inhaler (MDI), we advocate using a spacer as this is so much easier and will also increase the amount of medication deposited in the airways. There are often concerns about the side effects of the inhalers and this can be a reason for their non-adherence, and these concerns need to be discussed. We use the Asthma Control Test (ACT) to assess the patient's own perception of how their asthma is. Peak flow recordings are done, pre-and post-bronchodilator if necessary. We provide a management plan to follow which needs to be completed by their GP. We also provide a written summary with a plan or recommendation of what they need to do to help with their management of their asthma.

An education session takes about an hour and there is always time to repeat information and answer any questions. Following our visit, a letter is written to the referrer and a copy is sent to their GP. We also provide follow-up visits to assess the patient's asthma control, answer any questions and re-check their inhaler technique, and if necessary we will make suggestions, e.g. the patient may not be able to use a certain type of inhaler and it may help with adherence if the device was changed. If we find that the patient's asthma is still not well controlled and we are concerned about ongoing symptoms despite regular preventer use, then we will send a letter to their GP, with their permission, recommending a review of their medication.

A lot of older asthma patients do not perceive asthma as a chronic problem especially if they have late onset asthma, and many tell us that they thought it was due to getting older and not being as fit as they once were. Often they do not discuss their symptoms with their GP.

I recently visited an 80 year old with a history of asthma since age 15 years. She had not been using her Seretide (combination inhaler) regularly. She had a spacer but her technique using her MDI via the spacer was not correct. I demonstrated how to use the MDI correctly using the spacer and recommended she use her Seretide every day morning and night even when she was well, and not to stop, and to rinse gargle and spit afterwards to avoid the side effects of sore throat, hoarse voice and oral thrush. I did a follow-up visit 4 weeks later and she stated "I can't believe the difference in how I feel", and she was off to Waiheke for the day with her family. She told me that she would not have considered doing that before.

*Continued on page 12...*

Another patient who I recently saw was diagnosed with asthma aged 61 years. He had a normal spirometry test but he had a very high expired nitric oxide level (indicative of inflammation) with a dramatic clinical response to oral corticosteroids. He had been prescribed a combination inhaler but it was not used regularly. He was using his reliever every day, waking with symptoms at night and limiting his activities. When I saw him he was coughing, wheezing and felt tight in the chest. Following my assessment, I recommended he use his combination inhaler every day morning and night even when well and not to stop.

Due to his symptoms and low peak flow, I also recommended he see his GP for a review. He was admitted to hospital 2 days later with asthma exacerbation requiring oxygen and oral steroids.

When I saw him for a follow-up visit 4 weeks later his peak flow was much improved. He was using his combination inhaler regularly but he still had some symptoms but his use of the reliever was greatly reduced. I rechecked his inhaler technique. He asked if he had to continue using the combination inhaler: I recommended that he continue to use the combination inhaler everyday morning and night even if he is well. I provided a management plan for his GP to complete for him so he has a written plan to follow, not only to keep himself well but also what to do if his asthma is getting worse.

In conclusion, from the older patient's perspective, effective

self-management relies on the patient's ability to understand their condition, monitor symptoms, and recognise when there are changes in their symptoms and alter their medications as per their management plan and when to seek medical help. For this to occur, the patient must possess the knowledge and skills, and have the confidence and ability to apply those when needed.<sup>5</sup>

As an asthma nurse educator we are able to work together with their GP and practice nurse to ensure they are provided with the information and skills to do so.

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# I AM FEELING BETTER NOW - I DO NOT NEED MY MEDICATIONS!

By Vicki Lyford RN  
Asthma Nurse Educator

**Remember when you were coughing all the time, wheezing and not feeling well. You couldn't do activities because you could not get your breath? You had interrupted sleep. You went to your Doctor and after good discussions you were prescribed medications to help your lungs function better. After trial and error you found one that worked best for you and you now found you could play sport, and you were sleeping well at night. You could do everything that everyone else was doing.**

But that was ages ago and you have been feeling great for quite some time. You know what your triggers are and how best to minimise/avoid them, and deal with them. You feel you do not need to use them all the time now, maybe just when your asthma flares up. Yes, that sounds like a plan!! Hey you might have even grown out of your asthma!

Sorry to say this but NO! Not usually. It seems that once you have sensitive airways you have them for life. That is not to say that your symptoms will not go into remission! They may! However, they may appear again later in your lifetime.<sup>1,2</sup> Sadly, there is no way of predicting who will have symptoms that decrease and whose symptoms will reappear later on.<sup>3</sup> However, it does seem that if your asthma is moderate to severe as a child then you are less likely to have remission of symptoms.<sup>4</sup> This is possibly due to the damage to the lungs at this time.<sup>5</sup>

So we need to look at why you are feeling well! That is usually because you are taking your medications as your doctor has prescribed them.

#### Your RELIEVER medication:

- is usually blue in colour
- is used for those times when you feel short of breath, for whatever reason
- is a bronchodilator that opens up the airways by relaxing the bands of muscles that surround the breathing tubes thus allowing you to breathe easier
- works within 5-20 minutes and lasts for up to 4 hours. This is the medication you should carry around with you AT ALL TIMES. If it is a metered-dose inhaler (MDI), an aerosol type, then it is best used with a spacer, as this will increase the amount of medication that actually makes it into your lungs to help you.

Yes, you may feel you know your symptoms but what about those triggers you were not aware of. It could be anything from a lovely flower or plant in someone's garden you have just walked past. It could be from a perfume that a person was wearing when they walked past you! It could even be from an ingredient in the food you eat. That is why it is vital you carry your reliever inhaler and spacer with you wherever you go.

#### Your PREVENTER medication:

- the coloured one (red, purple, brown or orange) is the one that you take on a regular basis, usually twice a day
- works on the tissues lining the breathing tubes and stops them from swelling and narrowing the airways and helps stop the production of mucous thus ensuring your airways remain open so you can breathe easier. Again if it is an MDI you get more medication by using a spacer! If it is an Accuhaler or Turbuhaler then good technique is vital to ensure you get the most medication possible.

So, ultimately, it is because of how these medications have

kept your lungs open and you are breathing well that makes you feel you do not need them anymore. Of course, there are other factors such as eating well, maintaining or achieving a good level of fitness and sleeping well.

Remember; there are various steps to keeping your asthma under control.<sup>6</sup> You can do this by

- 1) Understanding your triggers and the symptoms they give you and avoiding them. Understand that if you need to use your reliever inhaler more than twice a week then your asthma may not be under control and it may be best to consult your doctor to see what action needs to be taken.
- 2) Take your medications correctly using correct technique +/- spacer.
- 3) Keep track of your symptoms and observe how your lungs are functioning. Keep a symptom diary record of your wellbeing; this shows what your lung function is like when you are well and you can compare the results for when you are not so well. Adjust your medication according to your action plan.
- 4) Take peak flow readings to show you that your lungs are working to the expected capacity for your height and age.
- 5) Forming an action plan with your doctor; this will show you when to adjust your medication depending on your symptoms or when to seek medical advice.<sup>7</sup>
- 6) Stop smoking and avoid second hand smoke to the best of your ability.
- 7) Steer clear of coughs and colds; get the flu injection annually.

And hopefully you will stay well with minimal symptoms, and life is good!

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# CROUP AND ASTHMA

By Sandy McBrearty RN  
Asthma Nurse Educator

**Croup is a contagious respiratory disease that is usually caused by the same viruses that cause the common cold. It is also called "acute laryngotracheobronchitis" as the virus affects the upper airways, that is, the larynx (voice box), the trachea and the bronchi. Occasionally croup is due to a bacterial infection and requires appropriate antibiotic therapy. The infection causes inflammation of the upper airways. Release of inflammatory factors causes swelling and increased mucous production on the inside of the airways. Patients experience mild fever, hoarseness, a barking cough, and noisy breathing. It is usually harmless though they may experience difficulty in breathing so that the chest and stomach muscles suck in with each breath.**

Croup occurs in as many as 6% of children ages 6 months to 6 years; the peak age for viral croup is 2 years. Viral croup is more common in males, with a male-female ratio of 3:2.

Recurrent croup or spasmodic croup (more than 2 episodes in a year) may not be viral and should be investigated by the GP or Medical Specialist.<sup>1</sup>

## Prevention

Croup spreads through the air when people with croup sneeze or cough. If one member of the family has croup the risk of passing it to other members of the household is around 15%. To reduce the spread, people should wash their hands often, keeping their fingers away from their nose and mouth. Used tissues should be handled as infectious materials and discarded immediately. Toys that have been mouthed by a child with croup should be washed. Visitors or family with cough should avoid holding or playing with children in the home.

Immunisation against Haemophilus influenzae (Hib) significantly reduces the risk of epiglottitis which can be a complication of croup. The epiglottitis is the flap at the base of the tongue that keeps food from going into the trachea. Due to its place in the airway, swelling of this structure can interfere with breathing.

## Treatment

Cool fluids, paracetamol for fever, keeping the child calm – as croup is worsened by agitation or crying. Remember it is contagious (catching) for 4-6 days, until the fever settles. Even a small amount of swelling in the upper airways can significantly increase the work of breathing in young children so oral corticosteroids may be given to reduce inflammation and swelling.<sup>1</sup> Humidification therapy has long been used as a treatment for croup however it has not been shown to reduce croup severity.<sup>2</sup>

## Croup is serious when:

- the child experiences difficulty in breathing, or
- is anxious or frightened, or looks blue or
- is dribbling and cannot swallow, or cannot speak, or chest sinks in when trying to breathe, or
- you hear a whistling or crowing sound

**Call 111 immediately to take your child to the nearest emergency department.**

## Is croup associated with asthma?

Some studies have shown an association but others have been unable to conclude this. A study carried out in 2012 found that the inflammation caused by moderate and severe childhood croup might result in a series of inflammatory processes in the airways; especially the small airways and the individuals will be prone to asthma in adolescence<sup>3</sup>.

Others have researched the presence of atopy and also gastroesophageal reflux disease (GERD) in children who have had croup and recurrent croup. Atopy is the tendency to heightened immune responses to common allergens and may lead to Immunoglobulin E (IgE) antibody response in individuals with asthma. Some studies have shown an association between the production of IgE antibodies to certain respiratory viral infections and the development of croup, although others have not found this.

The prevalence of GERD is known to be higher in patients with asthma than the general population.<sup>5</sup> Acid reflux can make asthma symptoms worse by irritating the airways and lungs and making the airways more sensitive. A study of Scottish children with recurrent croup (2001-2011)<sup>4</sup> found that GERD may be associated with recurrent croup since 26% of the children in this study showed positive evidence suggestive of GERD.

## Conclusion

Croup is usually viral and harmless but when breathing is affected or recurrent episodes occur there must be medical assessment of the patient. Hyper-responsive airways play a part in both recurrent croup and asthma. GERD may be a contributing factor for croup as it is for asthma. Steroids have been shown to be effective in both the treatment of croup and asthma.

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# HEALTH LITERACY ... WHAT IS IT ALL ABOUT?

By Alice Paul RN  
Asthma Nurse Educator

**In New Zealand, health literacy has been defined as: "The degree to which individuals have the capacity to obtain, process and understand basic health information and services in order to make informed and appropriate health decisions".<sup>1</sup>**

As health professionals we have recently included the phrase 'health literacy' into our repertoire. It is a relatively new concept in New Zealand but one that we are learning more about and how it plays a major role in our day to day interactions with our patients and other health professionals.

Literacy refers to a complex range of skills that individuals need to use every day at work, in the community and at home, including managing their health and well-being. In New Zealand, literacy has been most recently defined as listening with understanding, speaking to communicate, reading with understanding, and writing to communicate.<sup>2</sup> In this definition, literacy includes learning to speak English as an additional language.<sup>1</sup>

Our communities are becoming more multicultural and this includes many people who do not speak English as their first language. It is a well known fact that when people are unwell they become stressed and find it hard to follow what the health professional is trying to explain, and even harder if there is a language barrier.

Associate Professor Sharon Harvey, Head of the School of Language and Culture at AUT University said at The Royal Society of New Zealand workshop in Auckland in 2015 "New Zealand is legislatively a bicultural nation, founded on Te Tiriti o Waitangi."<sup>3</sup> In 2015, New Zealand's linguistic and cultural diversity surpassed any level of complexity we have previously known or experienced, with more than 160 languages being spoken in our homes, playgrounds and workplaces. Yet New Zealand is overwhelmingly a publicly monolingual country. Apart from on Marae and at specific cultural events like Chinese New Year, Diwali and the Pasifika Festival, English dominates nearly every aspect of public life.<sup>3</sup>

But health literacy is not just a barrier to those people with English as a second language it also includes English speakers who do not follow some of the terminology/instructions that the health professional uses as a matter of fact.

An example of medical language can go like this – "No hypertension, glucose levels of some concern, triglycerides look okay, but your LDL is a bit high so I'm going to put you on statins and we'll see how that goes. We want to schedule you for a biopsy sometime next week just to make sure that growth is non malignant."<sup>4</sup>

And another story which may seem far fetched but in fact probably happens a lot more than we realise

**Public health nurse:** "Jill, I see you are taking birth control pills. Tell me how you are taking them."

**Jill:** "Well, some days I take three; some days I don't take any. On weekends I usually take more."



**Public health nurse:** "How did your doctor tell you to take them?"

**Jill:** "He said these pills were to keep me from getting pregnant when I have sex, so I take them anytime I have sex."

This story is true. Jill is a single woman, age 21 years, who works as a house cleaner. She reads at about the second-grade level.<sup>5</sup>

A research paper by the Ministry of Health in 2010 suggests that people with poor health literacy:

- are less likely to use prevention services (such as screening)
- have less knowledge of their illness, treatment and medicines
- are less likely to manage their long-term/chronic condition
- are more likely to be hospitalised due to a chronic condition
- are more likely to use emergency services
- are more vulnerable to workplace injury because they do not understand safety precaution messages.<sup>1</sup>

In conclusion, in our work as asthma nurse educators, we are faced with a complex issue where medications are given when a patient is well. The need to understand that, is of the utmost importance in the prevention of asthma exacerbations. It is our job to be able to teach in user-friendly language, avoiding the use of acronyms and medical jargon and ensure the patient really understands.

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# NEW MEDICATIONS FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE

By Ann Wheat RN  
Asthma Nurse Educator

**As of the 1 March this year, patients with Chronic Obstructive Pulmonary Disease (COPD) have a greater choice of medications available to them for the treatment of their condition.**

When treating COPD the first line of treatment is short acting beta2 agonists (SABA) and/or short acting muscarinic antagonists (SAMA) (anti-cholinergic medication). Both these work on the muscles in the airways. SABA's work on the beta2 receptors in the lung to relax constricted muscles while SAMA's work by blocking muscarinic receptors in airway smooth muscle, glands and nerves to prevent muscle contraction.<sup>1</sup> These medications are used in COPD as first line treatment on an as required basis or up to four times daily to help with the symptoms of COPD such as breathlessness. Both SABA's and SAMA's work for four to six hours. There is also a combination inhaler of both SABA/SAMA available. An example of a SABA is Ventolin MDI and a SAMA is Atrovent MDI. The combination medication is called Duolin MDI.

As COPD becomes worse, the next line of medication is the long acting muscarinic antagonists (LAMA). In New Zealand we have had Spiriva or Tiotropium Bromide available in the handihaler (dry powder) for many years. Late in 2015, Seebri breezhaler (Glycopyrronium Bromide) also became available. Both these are twenty four hour LAMA medications. As from the 1st March these medications have been joined by Tiotropium in a new format, the Respimat, and Incruse Ellipta (both new devices), Umeclidinium Bromide.

Both these LAMA medications last for 24 hours.

As well as these, four new combination medications have also been funded in New Zealand. One of these is a new inhaled corticosteroid/LABA (ICS/LABA) combination and the other three are LAMA/LABA combinations. The three LAMA/LABA medications will give people the benefit of two long acting relievers in one puffer. They are: Anoro Ellipta or Umeclidinium Bromide/Vilanterol trifenate 62.5/25mcg, Spiolto Respimat or Tiotropium Bromide/Olodaterol Hydrochloride 2.5/2.5mcg and Ultibro Breezhaler or Glycopyrronium Bromide/Indacaterol Maleate 50/110mcg.

The final medication is the ICS/LABA combination. This is the first time in New Zealand that we have had a 24 hour ICS/LABA combination. In the past they have all been 12 hour combinations. The medication is Fluticasone furoate/Vilanterol trifenate 100/25mcg.

Now that the choices are available and for those people whose COPD symptoms are not well controlled, it is now possible to try a different medication and/or device to see if they become better controlled. The medications are all included in the Global Strategy for the diagnosis, management and prevention of COPD 2015.

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**Breo Ellipta**



**Incruse Ellipta**



**Spiriva Respimat**



**Spiolto Respimat**



**Anoro Ellipta**



**Ultibro Breezhaler**

Symbicort  
budesonide/formoterol

# Do colds make your asthma worse?

## Symbicort SMART\* could help.



Ask your doctor or go to [symbicort.co.nz](http://symbicort.co.nz) for more information.

Symbicort SMART reduced cold related asthma flare-ups<sup>†</sup> versus regular asthma therapy in an analysis of five clinical studies.<sup>1</sup>

<sup>†</sup>Flare-up defined as a severe exacerbation - deterioration in asthma resulting in hospitalisation or emergency room (ER) treatment, or need for oral steroids for ≥ 3 days.

**References:** 1. Reddel H et al. Eur Respir J 2011;38:584-593. 2. Symbicort Turbuhaler Data Sheet 4 March 2010. **Symbicort® Turbuhaler® 100/6 & 200/6** Symbicort Turbuhaler used in Symbicort SMART (Symbicort Maintenance and Reliever Therapy) contains budesonide 100µg or 200µg per dose (preventer) and formoterol 6µg (symptom controller). Symbicort SMART is indicated for the regular treatment of asthma where combination therapy is appropriate. Not all patients are eligible for treatment with Symbicort. Symbicort Turbuhaler has risks and benefits. Ask your doctor if Symbicort is right for you. Use strictly as directed. Symbicort should not be initiated as emergency treatment for severe exacerbations or for patients with acutely worsening asthma symptoms. Do not use if you are allergic to budesonide or formoterol. Tell your doctor if you have thyroid problems, heart problems, diabetes, problems with potassium levels, pregnancy, breast-feeding. Common side effects include mild irritation in the throat, coughing, hoarseness, thrush (fungal infection in mouth and throat), headache, trembling, fast or irregular heartbeat. Rarely, allergic reactions. Prescription Medicine. If symptoms continue or you experience side effects, see your healthcare professional. Your doctor's fee and a prescription fee will apply. For All Consumers Medicine. Information for Symbicort Turbuhaler see [www.medsafe.govt.nz](http://www.medsafe.govt.nz) Symbicort SMART and Turbuhaler are trademarks of AstraZeneca Group. AstraZeneca Limited, P299 Private Bag 92175, Auckland 1142. Telephone (08) 300 5650 Fax (08) 308 6651. MARCH 2016 essence A27055 NA7784 429.607.022

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\*Symbicort Maintenance And Reliever Therapy

## NORTH & SOUTH



### OTAHUHU HEALTH EXPO SATURDAY 5TH MARCH 2016

Asthma nurse educators are frequently invited to participate in community events. When we can, we attend these events as it enables us to talk to people about their asthma that we would not have reached in any other way. Many people are still not aware of our free home visits. At these events we provide brief education, explain medications, check peak flows, give away spacers, and if a more involved assessment is required, take a referral.



Karen and Sandy attended the Otahuhu Health Expo and in total provided information to over 30 families. Over 37 stalls took part in the event that was very well organised by The Otahuhu Business Association in conjunction with Rotary.



### CANBREATHE HAS MOVED

CanBreathe, based in Christchurch, moved their office in January to a new location at 196 Hills Road, Edgware. The new premises provide a more accessible and versatile facility to support people with breathing problems. The office is close to public transport and in addition to housing CanBreathe's regular services it provides additional space and facilities that can be utilised for group education and exercises and has much more parking. The CanBreathe team are excited by the opportunities the extra space in the new premises provides and the large meeting room is already being used by the Respiratory Relief Society for their North Christchurch weekly exercise group.



#### Open day

Thursday 7th April 10.00am-2.30pm  
All welcome — visit us and check out our new premises at 196 Hills Road.

To celebrate the move and the new facilities CanBreathe will be having an open day on Thursday 7th April. This is an opportunity for the general public, health professionals and other agencies to visit and see what we and our new premises have to offer. If you are in Christchurch call in and check out their new location.

# NEAT

### Have you noticed the advertisement for the NEAT course in the O<sub>2</sub> Journal?

NEAT stands for Nurses Education in Asthma Treatment – and is a one day workshop that is offered both in Auckland and Wellington.

Asthma NZ provides this education programme for registered nurses regularly during the year.

How might it support your nursing practice?

It is a full one day (6 hours) workshop that will provide the attendee with current information based on Pharmac guidelines for medication, GINA, and Australian guidelines in practice delivery.

This is an intense learning day and topics covered include a review of the pathophysiology of asthma, current and new medications, devices, triggers, and asthma resources.

The course is convened by experienced respiratory nurse specialists with external speakers where relevant.

Participants receive a workbook plus the education hours are relevant for professional practice and will be validated by a certificate of attendance.

The goal of NEAT is to provide a concise and precise overview of asthma management to support the nurse to be confident in providing a professional service for their respiratory clients.

NEAT will enable the nurse to educate the client in managing their asthma effectively and with confidence. The goal is to increase the compliance and understanding of asthma medication. You will review the reasons for poor compliance, and investigate ways in which you can initiate change.

The goal is that by the end of this 1 day training you will have a better understanding of the pathophysiology of asthma, in-depth knowledge of the medication the client has been prescribed, and the device that has been provided to complement medication delivery. If a spacer or mask is required you will be able to demonstrate best practice in its use, and explain why it is required. You will be able to educate and advocate for the use of an 'Asthma Action Plan' and ensure that the client fully understands how to use this effectively.

You will be confident in using a peak flow meter to monitor the client's asthma and in teaching the client how to use this device effectively and confidently to manage their asthma. You will be able to discuss signs and symptoms of asthma flare up with your client /caregiver and provide advice on how to manage these.

















Course costs vary depending on area, but are kept to a minimum keeping in line with Asthma NZ's philosophy that all nurses be able to access this education format. Numbers are kept to a maximum of 20 to ensure individual needs are met.

The NEAT program has been written and reviewed by the senior nursing management of Asthma NZ and the program has been successfully and professionally run in Auckland, and more latterly Wellington, for many years. It is suitable for all registered nurses in both primary and secondary care.

Asthma Auckland has a designated NEAT course for school nurses to attend in the school holidays, usually between terms 2 and 3.

# Kid's Page

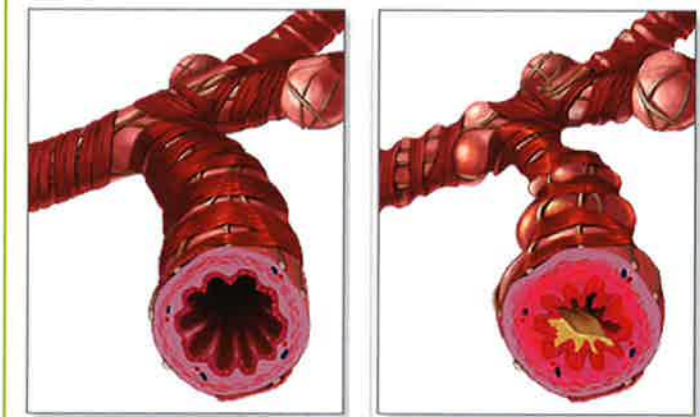
1 Find out the value for the 4th set of fruits

	+		+		+		=	40
	+		+		+		=	30
	+		+		+		=	31
	+		+		+		=	?

2 True or false

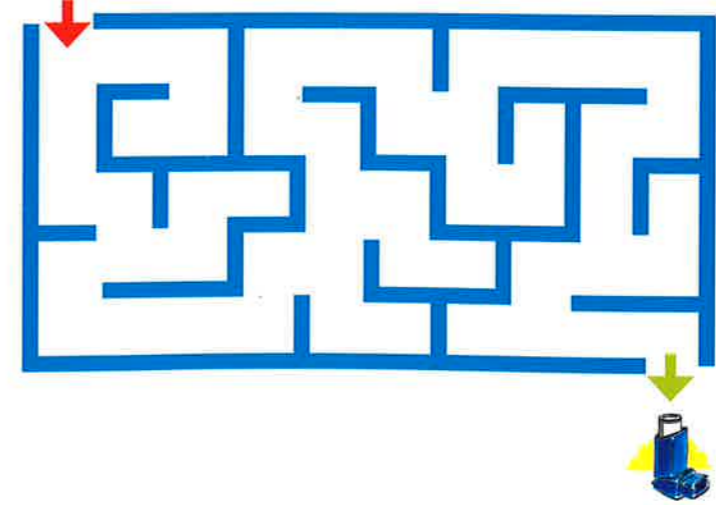
- You can catch asthma from someone who has it? True/False
- If my little brother has asthma I can't keep my pet. True/False
- Everyone's asthma is the same. True/False
- Cockroach is one of the triggers for asthma. True/False
- If your parents smoke, your asthma can get worse. True/False

3 Which picture is the correct one when somebody has asthma 1 or 2?



1 2

3



**Answers**  
 1. 27  
 2. False - You can't catch asthma, like a cold, from someone who has it.  
 False - Keep the pet away from the bedroom etc.  
 False - Everyone's asthma is not the same. In fact people with asthma can have different symptoms and different triggers.  
 True - Cockroach is a trigger for asthma.  
 True - Cigarette smoke is a trigger for asthma.  
 3. No. 2  
 asthma.

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# SPIROMETRY TESTING

By Karen Little  
Asthma Nurse Educator

**Spirometry testing is most commonly used to help diagnose Chronic Obstructive Pulmonary Disease (COPD), asthma and pulmonary fibrosis. It is also used to assess disease progression in these conditions. Spirometry testing should be used for patients presenting with undiagnosed respiratory symptoms, such as dyspnoea, wheeze and cough. Not all patients are suitable for testing and need to answer a questionnaire before the procedure can be carried out.<sup>1</sup>**

Spirometry testing is often required for pre-employment checks into professions, such as for pilots and professional scuba diving. It can also be useful to monitor life style changes such as giving up smoking or the commencement of medication. To be eligible for some medications such as Spiriva, for COPD, a spirometry is also required.

Before testing, patients should be advised to avoid smoking, alcohol, strenuous exercise, or a heavy meal. They should wear loose fitting clothing. Height and weight is measured, date of birth and gender are all entered into the spirometer.

Lung volumes increase during childhood and adolescence, reach a peak at around 25 years, and decline into old age. Tall people, as they have larger thoraces, have greater lung volumes than short people. The patient usually sits for the test. It needs to be explained to the client that the more effort that is put into the test, the more accurate the results will be. The client inhales as deeply as possible, and seals their lips around the mouth piece. With encouragement from the operator, the client blows out as hard and fast as possible, until all the air has been expelled from the lungs. A poor effort from the client will result in failure to meet the reproducibility criteria. This test should be repeated at least 3 times, to endeavour to record three acceptable and repeatable measurements. Reproducibility should be within 5% or 150ml for both the forced expired volume in one second (FEV1) and forced vital capacity (FVC).<sup>2</sup> All healthcare personnel using a spirometer must be trained in the safe use of the equipment, and be able to recognise and correct poor technique.

Stand-alone hand-held devices should be discouraged in favour of devices that allow data download and incorporation into medical records, and enable hard copy printouts of the results. At Asthma Auckland we use NDD Easy-on PC, and this is checked on a regular basis. All disposable mouthpieces have an inbuilt filter. Unless spirometers are maintained and calibrated, the results from them can be erroneous and invalid. All health care workers who care for COPD patients should have access to spirometry, as this is required to make a clinical diagnosis of COPD. Spirometry can be used to measure disease progression, but to be reliable, the intervals between measurements must be at least 12 months.<sup>3</sup>



Spirometry has the ability to measure FEV1, and FVC, thus demonstrating any loss of lung function before the client becomes symptomatic. FEV1 is the volume expired in the first second of maximal expiration after a maximal inspiration, and is a useful measure of how quickly full lungs can be emptied. An individual with unobstructed airways will be able to exhale three quarters of their vital capacity in the first second of a forced expiration. FVC is the maximum volume of air that can be exhaled or inspired during a forced manoeuvre. A minimum exhalation time of 6 seconds is required (and can take up to 15 seconds or more), unless the subject is a child or a young adult. The test can also differentiate between restrictive airway disease and obstructive airway disease. A reduction of FEV1 in relation to FVC will result in a low FEV1/FVC ratio, and is typical of obstructive ventilator defects (e.g. asthma and COPD). The feature of these conditions is difficulty with expiration: inhalation is unaffected. The lower limit of normal for FEV1/FVC is around 70-75%, but the exact limit is dependent on age. Severe obstructive airway disease can cause air trapping. When airways are already narrowed or unsupported, such as in emphysema, forced expiration can cause collapse of the airways. Thus, the FEV1 will be reduced. In restrictive ventilator defects, the FVC will be reduced, e.g. interstitial lung disease, tumours, respiratory muscle weakness.<sup>4</sup> Caucasians have the largest FEV1 and FVC of the various ethnic groups, however, Polynesians are similar to Caucasians. Chinese have been found to have FVC about 20% lower and Indians about 10% lower than matched Caucasians. Obesity can result in a restrictive-like result.<sup>4</sup>

When initial spirometry shows an obstructive pattern, reversibility testing may be performed to determine the degree to which FEV1 increases. Bronchodilators are withheld before testing. Baseline spirometry is performed then 4 puffs of salbutamol are administered via a spacer, then a repeat spirometry is performed 20 minutes later. The level of reversibility can help with the diagnosis between COPD and asthma. COPD has very little reversibility, whereas asthma is a reversible condition. Asthma will usually have an increase in FEV1 of 12% or more. Normal subjects can exhibit a small degree of reversibility, up to 8% in most studies.<sup>5</sup> Reversibility testing should not be performed as a stand-alone examination: a clinical history and examination should also be undertaken to differentiate between asthma and COPD. It is essential to differentiate between the two disorders because treatment, progression, and prognosis differ significantly. Asthma and COPD are both common conditions and the two can coexist.<sup>6</sup>

When performed correctly, spirometry can be part of diagnosing respiratory conditions, test for reversibility, show the patient the presence and severity of the disease, measure the degree of obstruction, and measure the efficacy of treatment. Accurate diagnosis is important, as some treatment options are only fully funded in New Zealand if specific criteria (spirometry measures) are met.

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# NASAL HIGH FLOW THERAPY

Clinical Research Scientist  
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## The status quo

Chronic obstructive pulmonary disease (COPD) is a class of respiratory diseases including: chronic bronchitis, emphysema and chronic obstructive airways disease.

Within Australasia COPD contributes more to the burden of disease than any other lung disorder, annual costs within NZ are reported to be \$192million.<sup>1</sup> Australasia has an aging population consequently the effects on mortality, morbidity and incapacity are predicted to accelerate. Within New Zealand, COPD affects an estimated 15% of the population over 45, and after cancer, heart disease and stroke, COPD is the fourth leading cause of death.

Without doubt, devastated lung tissue and disordered pulmonary physiology cannot be fully restored, however there is opportunity to improve quality of life, exercise capacity and rates of morbidity and mortality. It is now thought that Nasal High Flow (NHF) therapy may provide such an opportunity.

## Introducing a possible opportunity – NHF

NHF is one example of many therapies adopted from the acute setting for home use. The efficacy of this therapy as a form of respiratory support is well described for variety of conditions including COPD: secretion retention, hypoxemic respiratory failure, cardiogenic pulmonary oedema, as prophylactic therapy or treatment of respiratory failure post-surgery and post extubation.<sup>2</sup>

Historically, either simple nasal cannulae or face masks have been used to administer Long Term Oxygen Therapy (LTOT) which is dry and cold. NHF delivers warmed (37c), humidified (44mg/L) air/oxygen (21-100% O<sub>2</sub>) at flows of up to 60 L/min through specially designed cannulae. Fisher & Paykel NZ produce a NHF cannula (Optiflow™), and a gas flow source (myAirvo™).<sup>3</sup>

## How does NHF work?

NHF is known to be more comfortable and better tolerated than their counterparts. The delivery of a wide range of gas flows, minimises entrainment of room air during inspiration. Additionally the expired air is flushed from the upper airway during expiration, these mechanisms assure a more reliable delivery of oxygen. The upper airway is flushed with gas ready for inspiration which improves efficiency and work of breathing (WOB). NHF also delivers a low level dynamic airway pressure (2-8cmH<sub>2</sub>O), which may counterbalance auto-PEEP, further reducing WOB; improving oxygenation; and providing a back pressure to enhance airway patency during expiration. The gases delivered by this system are warmed and humidified, which improves comfort and enhances function of the cilia to clear mucous plugs. These plugs are a potential source of infection and airway obstruction.<sup>2</sup>

## NHF a tool for changing approaches to care

Positive outcomes are possible if the approach to care is empathic, and comprehensive in execution. Within Australasia a guideline has been developed as a resource for those



involved in the support of COPD patients.<sup>4</sup> This guideline contains a comprehensive plan for care.<sup>5</sup> There are five elements to the plan and it seems that NHF has a role to play in four of these:

- Confirm diagnosis and assess severity ✓
- Optimise function ✓
- Prevent deterioration ✓
- Develop support network and self-management plan
- eXacerbations – manage appropriate ✓

### Confirm diagnosis and assess severity

NHF has been used as a form of respiratory support during diagnostic bronchoscopy for COPD.<sup>6</sup>

### Optimise function

LTOT may optimise the quality of life for those with COPD.<sup>4,7</sup> The respiratory support provided by LTOT may reduce shortness of breath, cachexia (muscle wasting), and hypercarbia (high blood CO<sub>2</sub>), whilst improving the right ventricular function of the heart.<sup>8</sup> LTOT may also provide psychological advantage.<sup>9</sup> Collectively these benefits could translate into optimised function through: improved quality of life, fewer hospital admissions, and improved subjective health scores which all may reduce the costs of care. NHF is regarded as a superior therapy to standard oxygen therapy.<sup>10</sup>

### Prevent deterioration

The merit of using high inspired oxygen concentrations for acute exacerbations of COPD has been deliberated.<sup>11</sup> Studies have reported poorer outcomes due to associated hypercarbia and respiratory acidosis, compared to titrated

oxygen which can maintain oxygen saturations of 88-90%, which in this setting can only be reliably achieved using NHF.<sup>12</sup> Additionally, non-humidified LTOT may lead to mucus obstruction of the airways.<sup>13</sup> In a NZ based randomised controlled trial, saw LTOT with humidification to COPD patients improve lung function and quality of life.<sup>14</sup> It is known that exacerbation frequency increases with progressive airflow obstruction.<sup>15</sup>

### eXacerbations – manage appropriate

COPD is insidious, and often complicated by acute exacerbations which are secondary to infection and or a decline in cardio-respiratory status.<sup>8</sup> Acute exacerbations increase metabolism, WOB, and carbon dioxide (CO<sub>2</sub>) production.<sup>16</sup> Then medical interventions are often required, most commonly invasive or non-invasive ventilation.<sup>7</sup> A NZ study concluded that NHF significantly reduced exacerbation days, increased time to first exacerbation, in patients with COPD and bronchiectasis.<sup>14</sup>

### Progress on evidence for this therapy in the COPD space

There are a further seventeen clinical trials registered, and in progress, all of these trials shall add to the current body of evidence which considers the role NHF therapy has to play for the COPD patient community. In addition to this, evidence drawn from other related domains can also be regarded as a reliable source of secondary evidence in the COPD space.

For further information please refer to your healthcare provider or Fisher & Paykel Healthcare **telephone 0800 503 553.**

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## NEWSTREAM

Source: Allergol Int

**Persistently high exhaled nitric oxide and loss of lung function in controlled asthma.** Matsunaga K, Hirano T, Oka A, Ito K, Edakuni N; *Allergology International* (Jan 2016)

**BACKGROUND:** It remains unclear whether a persistently high exhaled nitric oxide fraction (FeNO) in patients with controlled asthma is associated with the progressive loss of lung function. **METHODS:** This was a 3-year prospective study. We examined the changes in pre-and post-bronchodilator forced expiratory volume in 1 s (FEV1) and FeNO in 140 patients with controlled asthma. We initially determined the FeNO cut-off point for identifying patients with a rapid decline in FEV1 (>40 mL/yr). Next, a total of 122 patients who maintained high or non-high FeNO were selected, and the associations between the FeNO trend and changes in FEV1 and bronchodilator response (BDR) were investigated.

**RESULTS:** A FeNO level >40.3 ppb yielded 43% sensitivity and 86% specificity for identifying patients with a rapid decline in FEV1. Patients with persistently high FeNO had higher rates of decline in FEV1 (42.7 ± 37.5 mL/yr) than patients with non-high FeNO (16.7 ± 31.5 mL/yr) (p < 0.0005). The changes in BDR from baseline to the end of the study, in patients who had high or non-high levels of FeNO were -0.8% and 0.1%, respectively (p < 0.01). In a multivariate analysis adjusted by age, body mass index, asthma control, blood eosinophil numbers, and FEV1% of predicted, a FeNO level of ≥40 ppb was independently associated with an accelerated decline in FEV1 (p < 0.05).

**CONCLUSIONS:** This study suggests that FeNO is potentially valuable tool for identifying individuals who are at risk of a progressive loss of lung function among patients with controlled asthma.

Source: *Annals of Allergy; Asthma; & Immunology*

**Predictors of asthma exacerbation among patients with poorly controlled asthma despite inhaled corticosteroid treatment;** Quezada W, Kwak E, Reibman J, Rogers L, Mastrorarde J, Teague W, Wei C, Holbrook J, DiMango E; *Annals of Allergy; Asthma; & Immunology* 116 (2), 112-7 (Feb 2016)

**BACKGROUND:** Asthma exacerbations are associated with decreased quality of life and increased health care usage. Identification of characteristics that predict increased risk of future exacerbations in patients with suboptimal control of asthma could guide treatment decisions.

**OBJECTIVE:** To examine patient characteristics associated with risk of asthma exacerbations in patients with uncontrolled persistent asthma.

**METHODS:** A retrospective analysis of adults and children with inadequately controlled asthma despite asthma controller therapy and enrolled in 2 randomized trials was conducted. Baseline characteristics of subjects who experienced an asthma exacerbation during the treatment period were compared with those of subjects who did not experience an exacerbation.

**RESULTS:** Of 718 subjects (402 adults and 295 children), 108 adults (27%) and 110 children (37%) experienced an asthma exacerbation during the study period. Unscheduled health care visits for asthma or use of oral corticosteroids in the previous year were significantly associated with asthma exacerbation during the study period (P<.01). Adult subjects who experienced an exacerbation had significantly lower forced expiratory volume in 1 second compared with those who did not (2.3 vs 2.5 L, respectively, P = .02). Children who experienced an exacerbation had lower baseline pre-and post-

bronchodilator ratios of forced expiratory volume in 1 second to forced vital capacity (77% vs 81%, P<.01; 82% vs 86%, P<.001, respectively). Symptom scores on validated questionnaires were significantly worse in adults but not in children who developed an exacerbation.

**CONCLUSION:** Spirometric measurements can help identify adults and children at increased risk for asthma exacerbation. Symptom scores could be helpful in identifying adults who are at high risk for exacerbations but could be less helpful in children.

Source: *J Asthma*

**Asthma and overweight/obese: double trouble for urban children.** Wiesenthal E, Fagnano M, Cook S, Halterman J; *Journal of Asthma* 1-7 (Jan 2016)

**OBJECTIVE:** To evaluate the effects of overweight/obese versus normal weight on symptoms, activity limitation and health care utilization among a group of urban children with persistent asthma.

**METHODS:** Data were obtained from the School Based Asthma Therapy trial. We enrolled 530 children ages 3-10 with persistent asthma from 2006 to 2009 (response rate: 74%). We conducted in-home interviews to assess symptoms and health care utilization. We measured height and weight in school nurse offices to determine BMI percentile, and compared normal weight children to overweight/obese (BMI>85th percentile) children. Bivariate and multivariate analyses were used.

**RESULTS:** We collected BMI data from 472 children (89%); 49% were overweight/obese. When controlling for child race, child ethnicity, intervention group, caregiver age and screen time, overweight/obese children had more days with asthma symptoms (4.25 versus 3.42/2 weeks, p=0.035) and more activity limitation (3.43 versus 2.55/2 weeks, p=0.013) compared to normal weight children. Overweight/obese children were more likely to have had an ED visit or hospitalization for any reason (47% versus 36%, OR 1.5, 95% CI 1.01, 2.19), and there was a trend for overweight/obese children to have more acute asthma visits in the past year (1.68 versus 1.31, p=0.090). Overweight/obese children were not more likely to be taking a daily preventive inhaled corticosteroid (OR 1.0, 95% CI 0.68, 1.56).

**CONCLUSIONS:** Overweight/obese children with persistent asthma experience more asthma symptoms, activity limitation and health care utilization compared to normal weight children, with no increased use of inhaled corticosteroids. Further efforts are needed to improve the health of these children

Source: *Respirology*

**COPD is characterized by increased detection of Haemophilus influenzae, Streptococcus pneumoniae and a deficiency of Bacillus species.** Simpson J, Baines K, Horvat J, Essilfie A, Brown A, Tooze M, McDonald V, Gibson P, Hansbro P; *Respirology* (Jan 2016)

**BACKGROUND AND OBJECTIVE:** Chronic obstructive pulmonary disease (COPD) is characterized by progressive airflow limitation and inflammation. Airway bacterial colonization is increased in COPD; however, the role of potentially pathogenic and non-pathogenic bacteria in the pathogenesis of disease is unclear. This study characterized the presence of bacteria in a well-characterized cohort of adults with COPD and healthy controls.

**METHODS:** Adults with COPD (n=70) and healthy controls (n=51) underwent clinical assessment and sputum induction. Sputum was dispersed, and total and differential cell counts were performed. Bacteria were cultured, identified and

enumerated. Supernatants were assessed for neutrophil elastase (NE) and IL-1 $\beta$ . Common respiratory pathogens were also determined using real-time PCR.

**RESULTS:** Participants with COPD had a typical neutrophilic inflammatory profile. The total load of bacteria was increased in COPD and was associated with poorer respiratory health status, as measured by the St George's Respiratory Questionnaire (Spearman's  $r=0.336$ ,  $P=0.013$ ). Significantly lower levels of culturable *Bacillus* species were identified compared with healthy controls. PCR analyses revealed increased rates of detection of potentially pathogenic bacteria with *Haemophilus influenzae* detection associated with higher sputum levels of NE and IL-1 $\beta$ , while *Streptococcus pneumoniae* was more common in male ex-smokers with emphysema and a deficit in diffusion capacity.

**CONCLUSION:** Non-pathogenic and pathogenic bacteria were altered in the sputum of patients with COPD. These observations highlight the potential to identify treatment and management strategies that both target specific bacterial pathogens and restore the microbial balance, which may lead to reductions in inflammation and subsequent improvements in lung health.

**Source:** Am J Respir Crit Care Med  
**Blood Eosinophils and Exacerbations in COPD: the Copenhagen General Population Study.** Vedel-Krogh S, Nielsen S, Lange P, Vestbo J, Nordestgaard B; American Journal of Respiratory and Critical Care Medicine (Dec 2015)

**RATIONALE:** Whether high blood eosinophils are associated with COPD exacerbations among individuals with COPD in the general population is largely unknown.

**OBJECTIVES:** To test the hypothesis that high blood eosinophils predict COPD exacerbations.

**METHODS:** Among 81,668 individuals from the Copenhagen General Population Study, we examined 7,225 with COPD based on spirometry. We recorded blood eosinophils at baseline and future COPD exacerbations longitudinally, defined as moderate (short-course treatment of systemic corticosteroids) or severe (hospitalization). We also assessed exacerbation risk in a subgroup of 203 COPD individuals with clinical COPD, defined as participants with  $\geq 10$  pack-years, FEV1 < 70% of predicted value and  $\geq 1$  moderate or severe exacerbation in the year prior to baseline.

**MEASUREMENTS AND MAIN RESULTS:** During a median of 3.3 years of follow-up (range 0.03-8.1), 1,439 severe and 2,864 moderate COPD exacerbations were recorded. Among all participants with COPD, blood eosinophils above versus below 0.34-10<sup>9</sup> cells/L had a multivariable adjusted incidence rate ratio of 1.76 (95%CI: 1.56-1.99) for severe exacerbations and of 1.15 (1.05-1.27) for moderate exacerbations. Corresponding values in those with clinical COPD were 3.21 (2.49-4.14) and 1.69 (1.40-2.04). In contrast, using a cut-point of 2% for blood eosinophils, the risk of exacerbations was only increased for severe exacerbations among individuals with clinical COPD but not in individuals from the broader population.

**CONCLUSIONS:** Among individuals with COPD in the general population, increased blood eosinophil levels above 0.34-10<sup>9</sup> cells/L were associated with a 1.76-fold increased risk of severe exacerbations.

**Source:** Respir Care  
**Pulse Oximetry Overestimates Oxygen Saturation in COPD.** Amalakanti S, Pentakota M; Respiratory Care (Dec 2015)

**BACKGROUND:** Measurement of oxygen saturation with a handheld pulse oximeter is widely practiced as a surrogate to invasive arterial blood gas analysis. Oxygen saturation is an important parameter in cases of COPD, but there are insufficient data on the role of pulse oximetry in patients with COPD, more so in diseases across its spectrum, such as chronic bronchitis and emphysema. We assessed the performance of pulse oximetry in acute respiratory failure of patients with COPD.

**METHODS:** This was a cross-sectional, observational study. We studied 50 subjects with COPD admitted to the Government General Hospital, a 1,000-bed tertiary referral center in Guntur, India, from June 2013 to July 2013. Simultaneous reading of SpO2 by a handheld pulse oximeter and SaO2 by an automated arterial blood gas analyzer were taken.



**RESULTS:** Pulse oximetry was sufficiently sensitive (84.60%) to hypoxemia in respiratory failure to be used in clinical situations. The mean difference (bias) between SaO2 and SpO2 was -3.98 (95% CI -4.68 to 3.28). There was less sensitivity (82% vs 85%) and positive predictive value (69% vs 85%) of the pulse oximeter to respiratory failure in subjects with chronic bronchitis versus emphysema.

**CONCLUSIONS:** Pulse oximetry performed poorly in comparison with the invasive arterial blood gas analysis. The variability of the readings was greater in the subjects with chronic bronchitis than in those with emphysema.



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- Hutt Mana Charitable Trust
- Infinity Foundation
- Jack Jeffs Charitable Trust
- John Ilott Charitable Trust
- Leys Charitable Trust
- Mana Community Grant Foundation
- Marvyn & Doug Smith Charitable Trust
- Mt Wellington Foundation
- New Zealand Lottery Grants Board
- New Zealand Post
- North & South Trust
- NZCT
- Ocean Bridge Shipping Ltd
- Pakeke Lions Club of Temuka Charitable Trust
- Pelorus Trust
- Pub Charity Ltd
- Sir John Logan Campbell Residuary Estate
- Southern Victorian Charitable Trust
- The Lion Foundation
- The Southern Trust
- Trillian Trust
- Trust House Community Enterprise
- TTCF

# Ever thought of leaving us a gift in your Will?



To enable Asthma New Zealand to carry out our work in your community, we rely on the support of people like you through donations and bequests.

**At least one person in New Zealand dies every week from asthma.**

By leaving us a gift in your Will, you are sharing our vision of a country where New Zealanders have control of their asthma symptoms and are able to live life to the full. We welcome the chance to talk with you about how you would like your gift used.

Please think about supporting Asthma New Zealand by leaving us a gift in your Will – it would be very much appreciated.

Please send me information on how I can help Asthma New Zealand by leaving a gift in my Will

I would like someone to contact me regarding leaving Asthma New Zealand a gift in my Will

I have left Asthma New Zealand a gift in my Will

Mr/Mrs/Miss/Ms: \_\_\_\_\_

Address: \_\_\_\_\_

Daytime Ph: \_\_\_\_\_

Evening Ph: \_\_\_\_\_

Mobile Ph: \_\_\_\_\_

Email: \_\_\_\_\_



# Let's fight Asthma together



## "We need your help"



Our family and friends may have asthma, but let's not let asthma have them. Your support to help our community breathe easy has always made a difference in thousands of people who fight to breathe.

### Please support generously

Yes, I would like to help New Zealanders breathe easy! Here's my gift to support your work

\$25    \$50    \$100    Other: \_\_\_\_\_

Auckland    Rotorua    Wellington    South Canterbury

Any donation over \$25 now gives automatic membership to any of the above societies  
My gift marked above is to be charged to my credit card

Visa    American Express    MasterCard

Card Number

Name of Card Holder: \_\_\_\_\_

Signature: \_\_\_\_\_ Expiry Date: \_\_\_\_\_

Cheque for the above value is enclosed  
 Your gifts can attract a tax rebate. We will send you a receipt shortly for your donation.

Mr/Mrs/Miss/Ms \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

Please send me information on how I can help Asthma New Zealand through my will

I have already left a bequest for the Asthma Society through my will

I would love to do some voluntary work to fight asthma

### Asthma New Zealand-the Lung Association

581 Mt Eden Rd, PO Box 67-066  
 Mt Eden, Auckland 1024, NZ.  
 Phone 09 623 0236, Fax 09 623 0774  
 Email anz@asthma.org.nz



*Thank you for helping us to fight asthma and make New Zealand breathe easy*



### Asthma New Zealand's partner societies around New Zealand:

**AUCKLAND ASTHMA SOCIETY (INC)**  
 581 Mt Eden Road, Auckland 1024  
 Ph (09) 630 2293

**CANBREATHE**  
 196 Hills Road  
 PO Box 13091  
 Christchurch 8141  
 Phone (03) 386 0278

**RESPIRATORY SUPPORT GROUP**  
 22 Manawa Avenue  
 Raumati, Kapiti Coast 5032

**ROTORUA ASTHMA SOCIETY**  
 Community House  
 1115 Haupapa Street, Rotorua 3010  
 Ph (07) 347 1012

**ASTHMA SOUTH CANTERBURY**  
 PO Box 267  
 Timaru 7940  
 Ph (03) 687 7379

**SOUTHLAND ASTHMA SOCIETY**  
 70 Forth Street, Invercargill 9810  
 Ph (03) 214 2356

**WAIRARAPA ASTHMA SOCIETY**  
 Wairarapa Community Centre  
 41 Perry St  
 Masterton 5810  
 Ph: (06) 377 1175

**WELLINGTON REGIONAL ASTHMA SOCIETY**  
 Level 1 - Salvation Army Bldg  
 125-137 Johnsonville Road  
 Johnsonville, Wellington 6037  
 PO Box 13520, Wellington 6440  
 Ph: 04 237 4520

**WHAKATANE ASTHMA AND COPD GROUP**  
 141-143 King Street, Whakatane 3120  
 Ph (07) 307 1447

**NORTH OTAGO ASTHMA SOCIETY INC**  
 Community House  
 100 Thames Street, Oamaru 9400  
 Ph (03) 434 3202

**ASTHMA WAIKATO**  
 PO Box 7013, Hamilton East  
 Hamilton 3247  
 Ph (07) 838 0851

### Questions, Letters, Articles, Advertisements

O<sub>2</sub> Journal welcomes dialogue with readers. Whether you are a person with asthma, a company involved in the sector, or a potential advertiser, we welcome your enquiries and communication.

**Contact:**  
**Asthma New Zealand**  
**581 Mt Eden Road, Auckland**  
**PO Box 67-066, Mt Eden**



# Seretide Accuhaler.<sup>®</sup> Helps make asthma control as easy as:



With a dose counter and no need for a spacer, this simple to use device ensures you consistently get the benefits of Seretide.<sup>1,2</sup>

If taken regularly, Seretide's dual action formula not only treats your asthma – but can help prevent the symptoms occurring in the first place.<sup>3</sup>

This convenient, innovative device is fully funded and available now.<sup>4</sup>

**ASK YOUR DOCTOR IF IT'S RIGHT FOR YOU**

**Seretide<sup>®</sup>**  
 Fluticasone propionate/Salmeterol xinafoate

References: 1. Seretide Data Sheet, GSK 2. Tarsin WY et al. *Int J Pharm.* 2006; 316:131-137. 3. Bateman ED et al. *Am J Respir Crit Care Med.* 2004; 170 (8):836-844. 4. Pharmaceutical Schedule April 2015, PHARMAC.

Seretide<sup>®</sup> (fluticasone propionate/salmeterol xinafoate; available as a 50/25, 125/25 or 250/25 micrograms per actuation inhaler, or as a 100/50 or 250/50 micrograms per actuation Accuhaler<sup>®</sup>) is a Prescription Medicine for the treatment of reversible obstructive airway disease (ROAD) including asthma, and for the treatment of chronic obstructive pulmonary disease (COPD). Seretide is a fully funded medicine. Seretide 250/25 microgram inhaler is a private purchase medicine that you will need to pay for. Use strictly as directed. Seretide is not for relief of acute symptoms. Always carry your reliever inhaler. Do not discontinue Seretide abruptly. Tell your doctor: If you are taking any other medicines or herbal remedies, you have pulmonary tuberculosis (TB), a thyroid problem or a heart problem, or you are having treatment for high blood pressure. Side Effects may include: Headache, 'shaky' feeling, fast heart rate, irritation in the nose and throat. If symptoms continue or you have side effects, see your doctor, pharmacist or health professional. For more information, see Seretide Consumer Medicine Information at www.medsafe.govt.nz. Normal doctor's office visit fees apply. Ask your doctor if Seretide is right for you. Seretide and Accuhaler are registered trade marks of the GlaxoSmithKline group of companies. Marketed by GlaxoSmithKline NZ Limited, Auckland. Adverse events involving GlaxoSmithKline products should be reported to GSK Medical Information on 0800 808 500. TAPS NA7680/15MA/SFC/0019/15a



# Are you on treatment for COPD and still experiencing symptoms?

## Introducing new once-daily SPIOLTO<sup>®</sup>

Ask your doctor\* if SPIOLTO<sup>®</sup> is right for you.

SPIOLTO is delivered by the first Soft Mist<sup>™</sup> Inhaler.<sup>1-4</sup>



NEW ONCE-DAILY  
**SPIOLTO<sup>®</sup>**  
**RESPIMAT<sup>®</sup>**

TIOTROPIUM & OLODATEROL



\*Normal Doctor's fees and pharmacy charges apply. SPIOLTO is fully funded for COPD. Special authority criteria apply. 1. SPIOLTO NZ approved data sheet November 2015. 2. Dalby R et al. Int J Pharm 2004; 283: 1-9. 3. Pitcairn G et al. J Aerosol Med 2005; 18: 264-272. 4. Zierenberg B. J Aerosol Med 1999; 12 (Suppl 1): S19-S24.

SPIOLTO<sup>®</sup> RESPIMAT<sup>®</sup> is fully funded. Special Authority criteria apply. Normal doctor's fees and a pharmacy charge apply. SPIOLTO RESPIMAT (per puff: tiotropium 2.5mcg + olodaterol 2.5mcg) is a PRESCRIPTION MEDICINE. SPIOLTO RESPIMAT has risks and benefits. It is used for the treatment of chronic obstructive pulmonary disease (COPD) including chronic bronchitis and emphysema. SPIOLTO RESPIMAT helps to make breathing easier. SPIOLTO RESPIMAT should not be used to treat asthma, or a sudden attack of breathlessness or wheezing. SPIOLTO RESPIMAT should be used with caution in patients with glaucoma (high pressure in the eye), liver, kidney and prostate gland problems and in patients with heart problems or overactive thyroid gland. SPIOLTO RESPIMAT may interfere with other medicines – always inform your doctor if you're taking any other medicines. Care must be taken not to allow the spray to enter into the eyes. SPIOLTO RESPIMAT like all medicines can cause unwanted side effects in some people. These may include dry mouth, sore throat, constipation, difficulty passing urine, blurred vision, fast heartbeat, palpitation, nervousness, headache, tremor and allergic reactions. If symptoms persist or you have side effects talk to your doctor. Always read the label and use strictly as directed. Ask your doctor if SPIOLTO RESPIMAT is right for you. A copy of the Consumer Medicine Information leaflet can be obtained from Boehringer Ingelheim or from the Medsafe website [www.medsafe.govt.nz](http://www.medsafe.govt.nz). Contact details: Boehringer Ingelheim level 1, unit 9, 42 Ormiston Road, East Tamaki, Auckland 2016 phone 0800 802 461 TAPS PP7820 NZ/SPO -161086