

COPD

A practical guide for
Primary Care Nurses

COPD Supplement

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Spirometry

Smoking Cessation

Pulmonary Rehabilitation

The Burden of COPD.....	1
From COPD POEMs	1
Spirometry	2
Spirometry in primary care.....	2
Which spirometer?.....	3
A guide to interpreting spirometry.....	4
Smoking Cessation	5
The task of the primary care team	6
Smoking cessation programmes.....	7
Quit Group services.....	7
Personal Quit Plan	8
Nicotine replacement therapy (NRT)	8
Other pharmacological interventions.....	9
Potential risks of smoking cessation.....	10
Pulmonary Rehabilitation	11
Programme content	11
Appendix One - Resources and contacts	13

Note: This supplement is intended to build on the information contained in the 'COPD POEMs - Patient Oriented Evidence that Matters'. These were distributed to all General Practitioners in April 2005. COPD POEMs can be downloaded for free from www.bpac.org.nz

The Burden of COPD

From COPD POEMs

COPD imposes a significant personal, societal and financial burden on New Zealanders. In 1997, COPD was ranked third overall in its impact on the health of New Zealanders after ischaemic heart disease and stroke.

The COPDX plan has been developed and adopted by Australia and New Zealand as their COPD guideline. It has a strong emphasis on the use of objective measures of function, the role of non-pharmacological interventions, promotion of self-management and smoking cessation.

The key recommendations of the COPDX plan are summarised as follows:

C	Confirm diagnosis & assess severity by use of spirometry and measurements of functional impairment.
O	Optimise function by relief of symptoms, increasing wellbeing and reducing the number and severity of exacerbations and complications.
P	Prevent deterioration by smoking cessation and reduction of exposure to other harmful inhaled fumes and particles.
D	Develop support network and self-management plan.
X	eXacerbations - manage appropriately and promptly.

The successful management of COPD requires a multi-disciplinary team approach. From a primary care perspective, the aim is to promote practical interventions that will slow disease progression, optimise function and decrease the number of exacerbations.

The focus of this supplement is on spirometry, smoking cessation and pulmonary rehabilitation. It is recommended that the supplement be read in conjunction with the bpac^{nz} COPD POEMs.

The COPD POEMs have been distributed to more than 3,500 general practitioners working within New Zealand, and can be accessed on the bpac^{nz} website at www.bpac.org.nz

Spirometry

Spirometry gives an objective measurement of airflow and lung volume when assessing lung function. It will distinguish between restrictive and obstructive lung diseases and is considered the gold standard for diagnosing, assessing and monitoring COPD. Accurate diagnosis requires the use of a regularly calibrated and validated quality spirometer (approx \$4,000 plus GST) by someone who has undergone comprehensive training. In practice in New Zealand, this will usually require referral to a spirometry service. Good advice is available from the Asthma and Respiratory Foundation on how to set up a spirometry service¹.

Whatever system is used for spirometry it is essential that smokers are not allowed to be complacent if a normal result is returned. Changes within the lung may be occurring despite the result still being within the normal range and the decision to quit smoking should not be delayed.

Spirometry in primary care

In our COPD faxback, practitioners asked about spirometry in primary care. Is there a place for spirometry in primary care which can augment evaluation of individual patients, but does not meet the high standards for accuracy required of diagnostic spirometry?

Monitoring spirometers are spirometers which do not meet the high standards required of diagnostic spirometers, but are suitable for monitoring progress in individual patients. These spirometers could also be used as part of the initial work up of those with respiratory problems, with the proviso that people who do not have unequivocal symptoms, signs and results confirming COPD or asthma are referred on for formal spirometric testing. Monitoring spirometers start at a cost of around \$1,000.

A single spirometry result does not represent the complex clinical consequences of COPD and it is not a substitute for clinical judgment in the evaluation of the severity of disease in individual patients.

American Thoracic Society, European Respiratory Society, 2004.

¹ Swanney M. Guidelines for setting up a spirometry service. Asthma and Respiratory Foundation of New Zealand, 2004.
http://asthmanzconz.axiion.com/images/page-content/File/PDF-files/LP_spirometry.pdf
(Accessed March 2005).

Which spirometer?

This section is taken from the publication “Spirometry” of the International Primary Care Respiratory Group (IPCRCG)². This two-page document is a useful source of information on spirometry.

Unfortunately we were unable to source any independent testing of low-cost spirometers available in New Zealand. The National Asthma Council of Australia has published a guide to spirometry use and purchase in Australia on their website. For more information on this excellent guide go to http://www.nationalasthma.org.au/newsletters/issue4_05.asp#spi

Ideally, a spirometer should have a graphical display to allow technical errors to be detected. It should be able to produce a hard copy. Regular calibration is essential. Some spirometers need to be calibrated before each session using a calibration syringe. Others hold their calibration between annual services. Check the manufacturer's instructions.

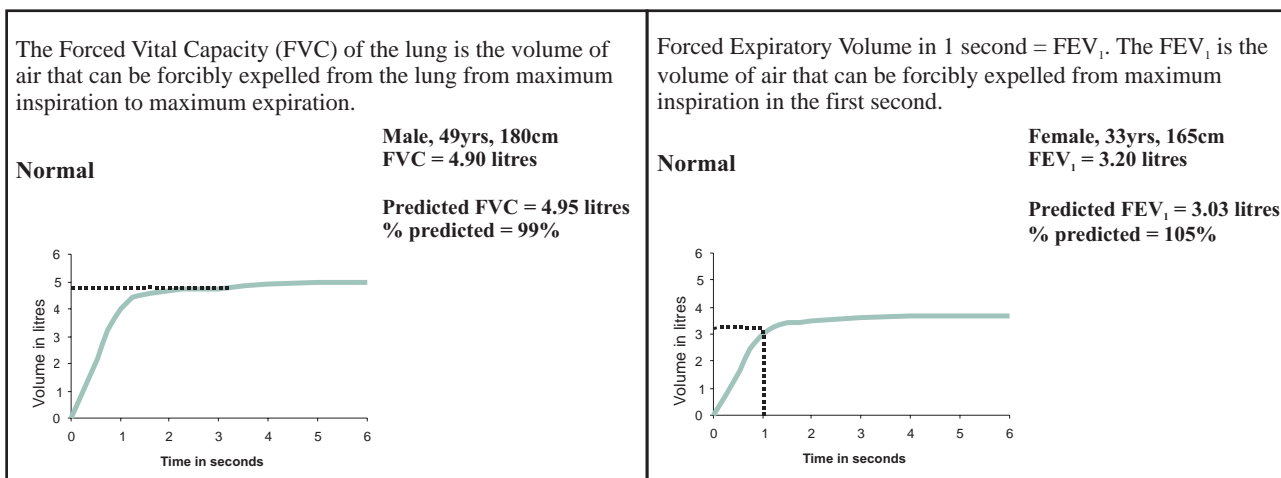
Three types of spirometer are commonly used in primary care:

- Small, hand held meters which provide digital readings. These are the cheapest option and small enough to fit into a medical bag, but the lack of graphs can make it difficult to judge when a blow is complete. Predicted charts and a calculator will be needed to interpret the results.
- Portable meters with integral printers. These are more expensive but they will undertake all the calculations, including reversibility. Small displays of the volume time graph help monitor the blow and the printout includes a flow volume loop.
- Systems designed to work with a computer which will display a graph, calculate predicted FEV₁ and FVC, and reversibility and provide a print-out. Integral memories allow data to be recorded outside the practice and uploaded when convenient.

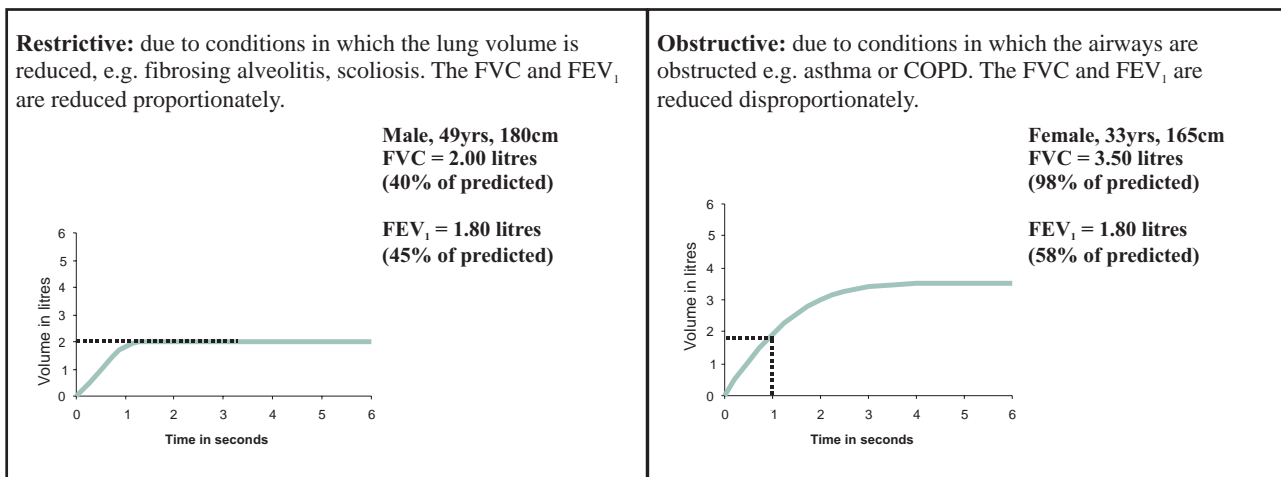
² Spirometry. Kaplan A, Pinnock H. International Primary Care Respiratory Group Opinion No 1. <http://www.theipcr.org/resources/index.php> (Accessed April 2005).

A guide to interpreting spirometry³

i) Normal spirometry



ii) Abnormal spirometry is divided into restrictive and obstructive ventilatory patterns

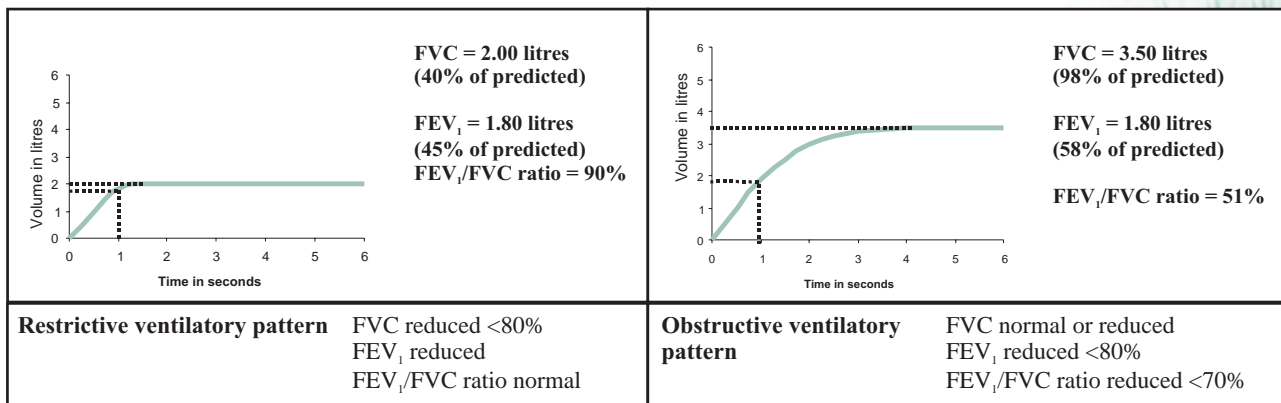


Severity of COPD: FEV₁ as a % predicted may be used to classify the severity of COPD.

iii) Forced expiratory ratio (FEV₁/FVC ratio, or FEV₁%)

The FEV₁/FVC ratio is the FEV₁ expressed as a percentage of the FVC (or VC if that is greater): i.e. the proportion of the vital capacity exhaled in the first second. It distinguishes between a reduced FEV₁ due to restricted lung volume and that due to obstruction.

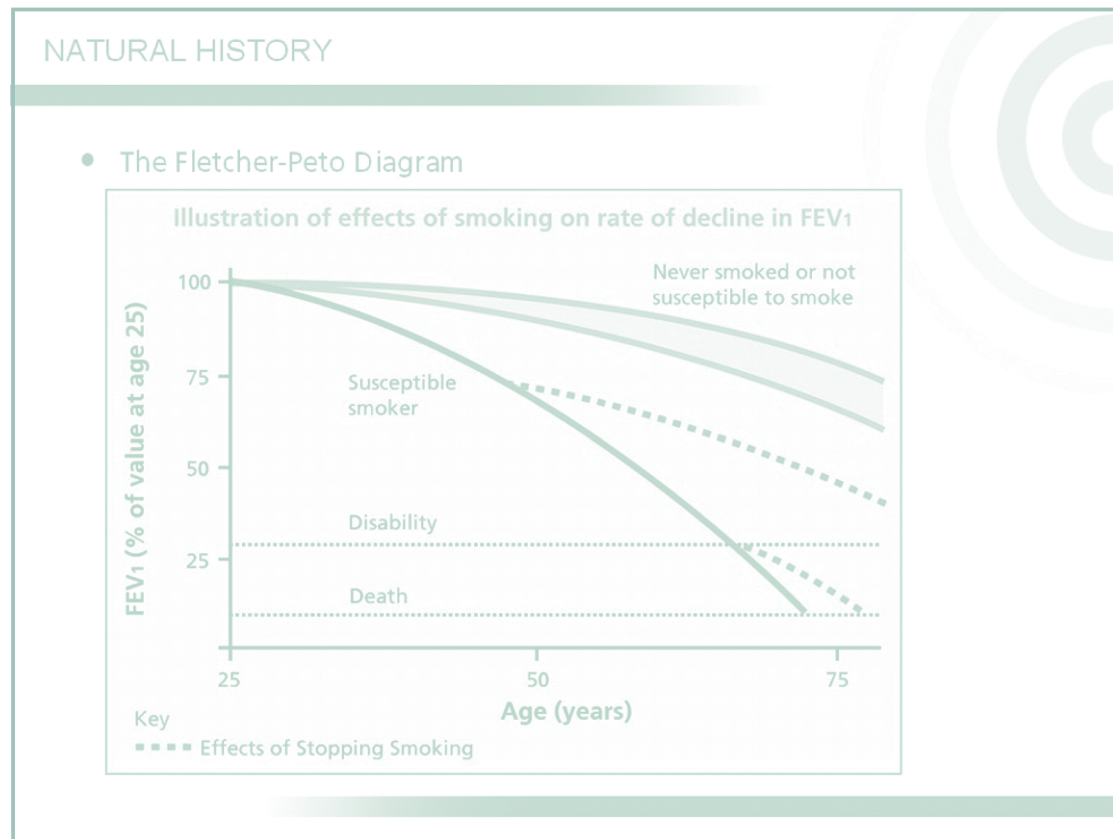
Obstruction is defined as an FEV₁/FVC ratio less than 70%.



³ Adapted from: Kaplan A, Pinnock H. Spirometry. International Primary Care Respiratory Group Opinion No 1. <http://www.theiprcg.org/resources/index.php> (Accessed April 2005).

Smoking Cessation⁴

Tobacco smoking causes almost all COPD, and smoking cessation is the only intervention that has been shown to halt the accelerated decline in lung function that occurs with COPD. The earlier a person stops smoking the greater benefit they will gain. Adolescents who stop smoking will have increased lung growth.



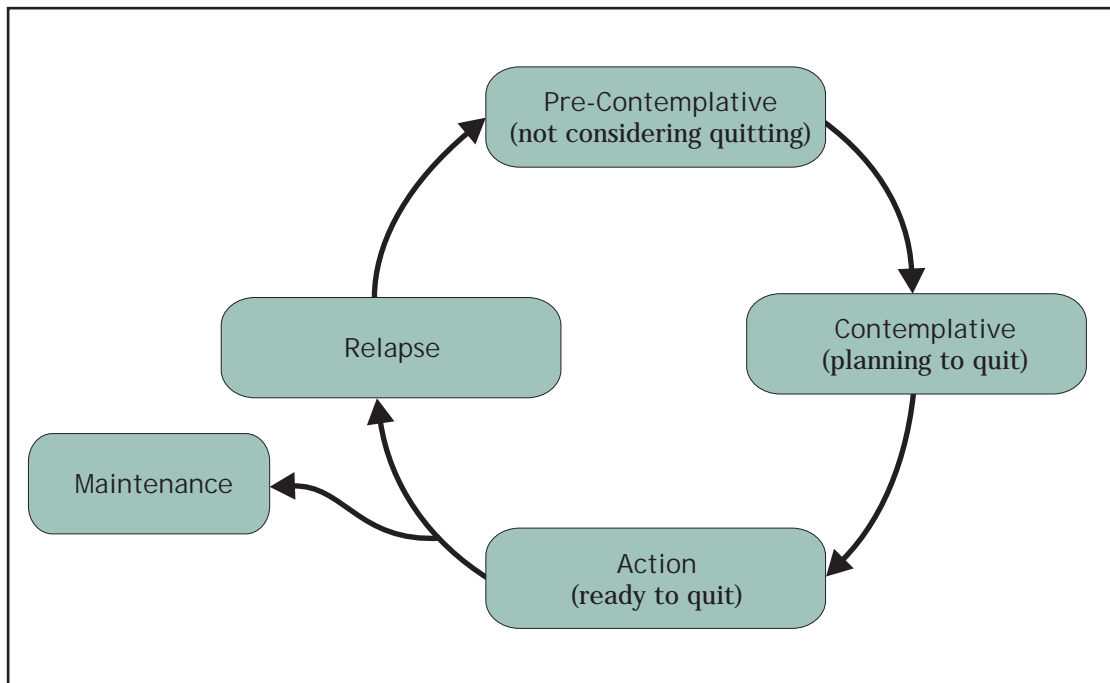
The risks of developing chronic obstructive pulmonary disease: The lines illustrate the natural decline and the effects that smoking and stopping smoking can have on FEV₁. This graph shows the rate of loss of FEV₁ for a hypothetical, susceptible smoker, and the potential effect of stopping smoking early or late in the course of COPD. Other susceptible smokers will have different rates of loss, thus reaching “disability” at different ages. The normal FEV₁ ranges from below 80% to above 120% so this will affect the starting point for the individual's data (not shown).

⁴ The majority of the information in this section is adapted from “Guidelines for Smoking Cessation” published by the National Health Committee in 2002, or the COPD handbook, 2002. Both of these excellent publications are available from the web page of the New Zealand Guidelines Group.

The task of the primary care team

The task of the primary care team is to move the patient at least one step around the smoking cessation cycle. For example: getting a pre-contemplative smoker to think about smoking cessation as an option for them would constitute a successful consultation. Smokers move around this cycle an average of three or four times before achieving permanent success, so if a smoker relapses this does not mean the task is hopeless.

The smoking cessation cycle:



Brief counselling is an effective way of progressing people around the smoking cessation cycle and should be provided at every visit by either the individual practitioner or a suitably trained practice member.

The **5-A strategy** is currently accepted best practice:

- **A**sk and identify smokers - record smoking status in the notes.
- **A**dvice smokers about the risks of smoking and benefits of quitting and discuss options - use clear personalised but non-confrontational language.
- **A**ssess the readiness to quit, motivations to do so and the degree of nicotine dependence - “How do you feel about your smoking?”.
- **A**ssist cessation - prepare a personal quit plan, consider referral to a formal cessation programme plus pharmacological interventions.
- **A**rrange follow-up in person or by phone to reinforce the message.

Smoking cessation programmes

Although most people stop smoking independently, formal smoking cessation programmes have success rates of around 15% and increase the likelihood that individual smokers will quit. Free smoking cessation practitioner training is available from The National Heart Foundation of New Zealand. Contact details are available in 'Appendix One - Resources and Contacts'.

Quit Group services

The Quit Group co-ordinates national smoking cessation programmes to help New Zealanders quit smoking. These services include:

- QUITLINE - A free telephone support and advice helpline.
- QUIT CARDS - A programme that lets health providers with an interest in smoking cessation register to distribute exchange cards for patches or gum to smokers wanting to quit.

QUITLINE - 0800 778 778

The Quitline is a free quit smoking telephone help line. Callers can:

- Request a quit pack which has practical quit smoking advice and information.
- Talk to a Quit Advisor for one-on-one support.
- Get exchange cards for subsidised nicotine patches or gum where suitable.

Quit Advisors are expertly trained to help smokers with their quitting. Many Advisors are ex-smokers or have whanau and friends who have been affected by smoking-related illnesses.

QUIT CARDS

The Quit Card programme lets health providers distribute exchange cards for subsidised nicotine patches and gum to people wanting to quit smoking.

Any health provider in New Zealand who has trained in smoking cessation may apply to become a Quit Card provider. Free national smoking cessation training is available from The National Heart Foundation - <http://www.nhf.org.nz>

Personal Quit Plan

The decision to stop smoking is very personal and each individual will have their own motivations and barriers to consider. These can be laid out in a personal quit plan. Although this plan will have components common to all quitters there is not one plan that will suit all people. For this reason bpac^{nz} has produced a modifiable one⁵. The Quit Book produced by the Ministry of Health gives more in depth information for patients to support their smoking cessation.

Nicotine replacement therapy (NRT)

Quit rates are doubled with the use of NRT and it is suitable for most people who are making a serious attempt to quit smoking. NRT is safe in people with stable cardiac disease such as angina pectoris, and because it produces lower peak levels than smoking, NRT should theoretically be safer, even in patients with unstable disease. However, recent MI, acute stroke, unstable angina and severe cardiac arrhythmias are considered contraindications. People with high cardiovascular risk factors will get even greater benefits from smoking cessation than those with lower risk.

NRT does not contribute to weight gain in smoking cessation and often mitigates against it whilst it is being taken.

There is little evidence for the effectiveness of NRT in people who smoke fewer than 15 cigarettes per day. Indeed, people who smoke fewer than 10 cigarettes per day may become addicted to the NRT.

Caution is also advised in adolescents because of lack of evidence of effectiveness in this age group. It is probably acceptable for heavily addicted adolescents to use NRT as long as they have discussed the issues with a parent or other responsible adult.

It is preferable for pregnant women to quit smoking without pharmacological help. However, the use of NRT may be considered. Continued heavy smoking will expose the woman and foetus to the inhaled nicotine and other noxious components of tobacco smoke. This must be balanced against the exposure to the nicotine in NRT.

⁵ 'My Quit Plan' is available from the bpac^{nz} website www.bpac.org.nz. You are welcome to download this and modify it to suit your needs. A printed version can also be ordered from the website.

In New Zealand, NRT is subsidised through Quitline and providers who are registered with the Quit Card programme. Quit Cards can be exchanged for a four-week supply of NRT - a surcharge of \$5.00 applies. All forms of NRT appear to be useful in aiding smoking cessation. It is the patches and gums which are subsidised through the Quit Card programme. NRT is also available in New Zealand as lozenges and sublingual tablets although neither of these is subsidised. They can be considered as comparable to the gum as they all depend on the buccal mucosa to absorb the nicotine.

The use of patches provides a steady nicotine level sufficient to reduce withdrawal symptoms, but does not provide the peak nicotine levels of smoking which reinforce the addiction. The addition of a gum may further improve abstinence rates.

The strength of patch used depends on the number of cigarettes smoked daily. Three strengths are available in doubling doses, e.g. 7, 14 and 21mg. Both 24 and 16-hour patches are available. The 24-hour patches achieve higher blood nicotine levels and provide more relief from morning cravings but both patches have about the same efficacy. Six to eight weeks of use are generally required with tapering of the nicotine dose every two weeks. The only significant side effect is skin irritation which is generally mild and rarely leads to cessation of use.

Nicotine is rapidly absorbed from gum through the oral mucous membrane. The gum is chewed only two to three times per minute to avoid excessive salivation, swallowing of nicotine and gastrointestinal side effects. It should then be parked inside the cheek. Patients should taper the dose gradually but dependence on the gum can occur in up to 20% of users. Most patients should have ceased the gum within three months.

Other pharmacological interventions

Nortriptyline can be used for smoking cessation and has similar efficacy to NRT. It can be prescribed for smoking cessation in New Zealand, but patients need to be informed of the evidence for its risks and benefits and that it is not registered for this indication.

The manufacturers recommended dose of nortriptyline for smoking cessation in adults is 25mg per day starting 10 - 28 days prior to the quit date; increase gradually to 75 - 100mg per day over 10 days - five weeks; continue for 12 weeks (or up to six months). Elderly reduce dosing frequency⁶.

⁶ MIMS. Nov 2004. Issue 2 (98).

Bupropion is an atypical antidepressant which is registered for use in smoking cessation but not funded in New Zealand. It has a similar efficacy to NRT and nortriptyline, but has a wider range of adverse reactions which include the potential for increased risk of seizures, particularly in those who are already at risk or are taking drugs which lower the seizure threshold.

The suggested dose of bupropion is 150mg daily for three days increasing to 150mg twice daily thereafter. There should be an interval of at least eight hours between successive doses. Patients should be treated for at least seven weeks. The recommended dose should not be exceeded.

Potential risks of smoking cessation

When hydrocarbons are no longer inhaled, liver enzymes down-regulate and return to “normal” over about a one-month period. This means that the clearance of medicines metabolised by these enzymes will be reduced with a resulting increase in their concentrations. Of particular importance are caffeine, chlorpromazine, clozapine, flecainide, haloperidol, imipramine, mexiletine, olanzapine, propranolol, theophylline, warfarin and also insulin. Patients on these drugs may need to be monitored for potential problems associated with increased concentrations of the drugs.

Care should also be taken with those who have poor control of potentially brittle health conditions such as heart failure, diabetes, hypertension or mental illness^{7, 8}.

“Remember, smokers aren't the problem. Tobacco is the problem. Smokers can be part of the solution even if they can't quit at this time. Smokers can provide a smoke free environment for their family and fellow workers by smoking outside and not smoking in the car. This reduces the 'vertical transmission' of smoking-related illness and puts smokers in a win: win situation, assisting them to become active participants in a smoke free strategy.”

Dr Paparangi Reid
Public Health Medicine Specialist and Māori Health Researcher

⁷ Chronic Obstructive Pulmonary Disease. Australia and New Zealand Management Guidelines and the COPD Handbook. Thoracic Society of Australia and New Zealand, Australian Lung Foundation, 2002. <http://www.nzgg.org.nz> (Accessed March 2005).

⁸ Guidelines for smoking cessation. National Health Committee, 2002. <http://www.nzgg.org.nz> (Accessed March 2005).

Pulmonary Rehabilitation⁹

Pulmonary rehabilitation is one of the most effective interventions in COPD, and has been shown to reduce symptoms and improve functioning by:

- Improving cardiovascular fitness, muscle function and exercise endurance.
- Enhancing self-confidence, coping strategies and adherence to treatment.
- Improving mood and social functioning.

Pulmonary rehabilitation should be offered to all patients with moderate or severe COPD and will probably benefit others. It is effective in both community and hospital based settings but is probably most cost-effective in hospital outpatients.

Programme content

Outpatient programmes should contain a minimum of 6 weeks of physical exercise, disease education, psychological, and social intervention.

Physical exercise

Training frequency should involve three sessions (20-30 minutes) per week of which at least two should be supervised. The exercise prescription should be individually assessed.

Physical aerobic training, particularly of the lower extremities (preferably brisk walking or cycling) is essential. Upper limb and strength building exercise can also be included.

Training should usually be of mid-intensity. However, benefit can be obtained from lower intensity training where necessary and increased benefits can be obtained from higher intensity training when this can be achieved. Individual training intensity should be recorded and can be increased through the programme where tolerated.

Supplementary oxygen during training may need to be provided.

⁹ BTS Standards of Care subcommittee. Pulmonary Rehabilitation. Thorax 2001;56:827-34. <http://thorax.bmjournals.com/cgi/reprint/56/11/827> (Accessed March 2005).

Disease education

Comprehensive disease education for patients and families is an important part of overall management that can be conducted within the rehabilitation programme. Individual advice on physiotherapy, nutrition, occupational therapy, and smoking cessation helps improve adherence to these programmes.

Psychological and social interventions

During pulmonary rehabilitation advice should be provided for emotional issues related to COPD. These include end of life planning and the constraints that COPD may impose on sexual activity.

Outcome measures

Outcome measures should be embedded in the programme as part of the process and should reflect the goals of rehabilitation. These goals cannot be expressed solely as lung function measurement, and must include measures of relevant impairment, disability, handicap, and domestic activity. Outcome measures need only be simple, but centres with expertise can use advanced technology.

Appendix One - Resources and contacts

Asthma and Respiratory Foundation of New Zealand

Email: arf@asthmanz.co.nz

Web: <http://www.asthmanz.co.nz>

- Patient support
- COPD Handbook
- COPD self-management plans
- Diagnosis & Treatment of COPD - flow chart
- Spirometry services handbook

The National Heart Foundation of New Zealand

Email: info@nhf.org.nz

Web: <http://www.nhf.org.nz>

- Free smoking cessation practitioner training

Goodfellow Unit at the University of Auckland

Web: <http://www.health.auckland.ac.nz/goodfellow/contracts/tads.html>

- Tobacco, Alcohol and Other Drugs Early Intervention Training Programme (TADS)

Aukati Kai Paipa and other Māori cessation programmes

Web: <http://www.auahikore.co.nz/contacts/aukati.htm>

- Provide kapupapa Māori smoking cessation programmes

International Primary Care Respiratory Group

Web: <http://www.theipcrg.org>

- A range of resources for primary care respiratory practitioners

Ministry of Health

Web: <http://www.healthed.govt.nz>

Locally: local Public Health provider

- Providers of The Quit Book

Quitline

Email: quit@quit.org.nz

Web: <http://www.quit.org.nz>

- Quit Cards supplied to providers registered with the programme
- Quitline (0800 778 778)