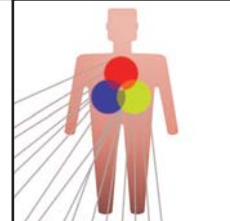




# A smoking related triad: PAD, COPD and CCF



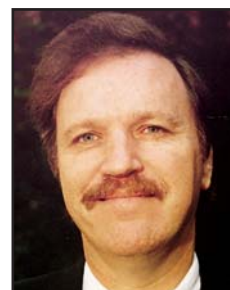
**BACKGROUND** Tobacco smoking is the modifiable risk factor responsible for the greatest burden of disease (loss of health and premature mortality) in Australia.

**OBJECTIVE** This article discusses the complexities of management of a patient suffering from a smoking related triad of illnesses: peripheral arterial disease, chronic obstructive pulmonary disease and ischaemic heart disease related congestive cardiac failure.

**DISCUSSION** As well as considering optimal management of the individual conditions, the patient's mental health and overall quality of life needs to be considered. Even at this late stage, smoking cessation is critically important. The patient is likely to require 6–8 medications, creating the potential for interactions and confusion, so careful medication management and patient education is required. The support of a multidisciplinary team will be required, with coordination of care being the key. Care planning and case conferencing between the general practitioner, the patient and other health professionals is essential for optimal care.

## Case history – Gavin

Gavin is a 61 year old married bus driver of Scottish descent who lives in a low income, outer urban area. He sees his general practitioner (who is overworked because of the shortage of GPs in the area) and gives the following history. He previously smoked 40 cigarettes per day but now smokes 5–10 per day. He drinks 2 standard drinks of beer per day. His diet is high in saturated fat and low in fruit and vegetables (average 2 portions or less per day). He has had long standing cough and wheeze. His physical activity is limited by shortness of breath on exertion, but doesn't walk far enough to experience claudication. His blood pressure is 145/95 mmHg but has not been treated. There are absent pedal pulses and dependent erythema of the legs. There is no evidence of carotid disease. He has a gallop rhythm. It is difficult to auscultate his chest but there are fine crackles just audible in his lower lung fields. His FEV1 is 1.1 L (39% of the predicted value) and VC is 3.0 L. These do not improve significantly following inhaled bronchodilators. Chest X-rays show hyperinflation with some hilar congestion and an enlarged heart. His electrocardiogram shows evidence of an old inferior myocardial infarct and left ventricular hypertrophy. Total cholesterol is 6.5 mmol/L and HDL 0.9 mmol/L. Fasting blood sugar is 4.5 mmol/L.



**Mark Harris,**  
MBBS, FRACGP,  
DRACOG, MD, is  
Professor of General  
Practice, School of  
Public Health and  
Community Medicine,  
University of New  
South Wales.

## How serious is this?

Very. Gavin's 5 year probability of another cardiovascular event based on his absolute risk assessment is 36%.<sup>1</sup> The prognosis for people with heart failure is poor, with 50% of severe cases dying over a 12 month period.<sup>2</sup> The prognosis for patients over 50 years of age with chronic obstructive pulmonary disease (COPD) is also poor with high mortality persisting in Australia over the past 2 decades, while overall heart disease mortality has declined.<sup>3</sup> Patients with congestive cardiac failure (CCF) and COPD frequently present and are admitted to hospital and experience poor quality of life.

## How and when this could have been prevented?

Tobacco smoking is the modifiable risk factor responsible for the greatest burden of disease (loss of health and premature mortality) in Australia, accounting for 12% of the burden in males and 7% in females.<sup>4</sup> Cigarette smoking is the most important factor in the development of COPD and 15–20% of smokers will develop clinically significant COPD.<sup>5,6</sup> If Gavin had stopped smoking his risk of cardiovascular disease would have dropped dramatically within 12 months. If Gavin had stopped smoking 10 years earlier, he could have delayed the onset of COPD until his 70s.

## How should his behavioural and physiological risk factors be managed?

Smoking cessation is critically important even at this late stage, reducing his risk of another cardiovascular event by a third and preventing further deterioration in his lung function. The '5 As' for smoking cessation are to:

- Ask
- Assess
- Advise
- Assist, and
- Arrange follow up.<sup>7,8</sup>

Even brief advice to Gavin will increase his chance of successfully stopping smoking. When advice and information is tailored to a patient's readiness to quit, the effectiveness of this increases significantly. Nicotine replacement should be offered to all smokers who have evidence of nicotine dependence and all patients intending to quit should be offered referral to 'Quitline' for ongoing support and information.

Improving Gavin's diet and increasing his physical activity would improve his risk further, as well as

helping to lower his total cholesterol and increase his HDL cholesterol. To bring his cholesterol down to National Heart Foundation target levels of below 4.0, will also require use of a cholesterol lowering agent (usually a statin). However, this does not obviate the need for Gavin to improve his diet and physical activity, which will also help to control his weight and blood pressure. Changing his diet should involve assessment and education of both Gavin and his wife by a dietician.

Increasing physical activity is particularly difficult in the context of Gavin's impaired exercise tolerance and peripheral arterial disease. A carefully graded program would ideally be developed by an exercise physiologist or physiotherapist associated with a cardiac rehabilitation program. This may involve brief periods of activity such as walking punctuated by rests if he experiences dyspnoea or claudication over 2 or more periods per day.

## What is the optimal management of each of these problems?

### For his cardiac failure

Gavin should have echocardiography to determine the extent of his ventricular function although this is likely to be at least moderately impaired given the left ventricular hypertrophy evident in his electrocardiogram (ECG). The treatment of choice is an angiotensin converting enzyme (ACE) inhibitor (this would be recommended even if Gavin had no symptoms at all as an ACE inhibitor improves ventricular function).<sup>9</sup> Beta blockers are also indicated, not only because of his past infarct, but because it helps to stabilise left ventricular systolic dysfunction.<sup>10</sup> Both are likely to help reduce his blood pressure. Low dose aspirin is also recommended to reduce his risk of re-infarction.<sup>11</sup> As noted above, Gavin should be referred for tailored advice on diet, especially regarding reducing dietary sodium and a carefully tailored physical activity program. Gavin should be advised to limit his fluid intake to 1.5 L/day, weigh himself daily, and to contact his GP if his weight increases by more than 1.5 kg in a 24 hour period, or if warning signs of dyspnoea, oedema, or abdominal bloating are observed.<sup>12</sup>

### For his peripheral arterial disease

Gavin should be further assessed to determine the arterial flow to his lower limbs. The key treatment objective is to prevent the disease from progressing. Aspirin is indicated both for his peripheral arterial disease (PAD) and the reduction of the risk of re-infarction (clopidogrel may be appropriate if aspirin is not tolerated). Where

there is not evidence of ischaemia, warfarin is not usually indicated. However, this may change if re-vascularisation is required. Physical activity may help stimulate development of collateral circulation.

### For his chronic obstructive airways disease

A key aspect of Gavin's assessment should be to determine if there is reversible component to his reduced lung function. In particular, the response to inhaled or oral steroids needs to be assessed (although systemic steroids should not be continued long term for COPD). His cardiovascular drugs especially the beta blockers and aspirin may exacerbate any reversible airways obstruction. In addition to short or long acting bronchodilators, Gavin may require long term oxygen therapy ( $\leq 2$  L/minute for  $>15$  hours/day) if he is hypoxaemic ( $\text{PaO}_2 < 55$  mmHg, or 7.3 kPa).<sup>13</sup>

While intermittent treatment of acute exacerbations of COPD may be important, their prevention and the management of the chronic problems of fatigue, exercise tolerance and depression are critical. Recommended management of COPD involves:

- accurate diagnosis
- assessing severity (clinically and using spirometry)
- optimising function with both pharmacological and nonpharmacological measures, and
- preventing further deterioration by smoking cessation and influenza and pneumococcal vaccination.<sup>14,15</sup>

Pulmonary rehabilitation – both hospital and community based – has been shown to be helpful in improving functional status of COPD sufferers and is recommended for people with moderate to severe COPD.<sup>16,17</sup>

We should not forget Gavin's mental state. He is likely to be anxious and he and his wife may need strategies such as relaxation therapy and cognitive behavioural therapy to manage this. He may also be depressed in the face of his disability and uncertain prognosis.<sup>18</sup>

### Coordination

Gavin's conditions are complex and there is ample scope for confusion. He will require 6–8 medications and there is a risk of interactions between the medications and his other comorbidities. Lack of adherence to treatment regimens is also a risk unless Gavin has been adequately informed and provided with self management education. The latter is also important to help him deal with exacerbations and manage his risk factors and anxiety or depression.

Gavin requires the support of a multidisciplinary health care team. Those involved are likely to include a

cardiologist, vascular surgeon, respiratory physician, specialist nurse, community pharmacist, exercise physiologist, physiotherapist, dietician, psychologist and occupational therapist. Others may include a social worker, home care services, and self help groups. This may easily become fragmented and thus his management needs to be coordinated carefully. There may need to be compromise as well as an understanding of what other members of the health care team can offer. While the GP and patient can coordinate much of this, care planning and case conferencing between other health professionals and members of the practice team (such as the practice nurse and any allied health services) is essential if Gavin is to receive optimal care. Over time this should help to prevent clinical events, recurrent hospitalisations and maintain or improve his quality of life.

### Resource

Quitline: telephone 131848

Conflict of interest: none declared.

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Email: [m.f.harris@unsw.edu.au](mailto:m.f.harris@unsw.edu.au)

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