

Beyond the lungs: understanding cardiopulmonary risk in COPD

Key points

- **Chronic obstructive pulmonary disease (COPD) is a systemic disease;** while often viewed as a lung condition, cardiovascular disease is a leading cause of death in people with COPD.
- **Exacerbations are high-risk events,** triggering a sharp rise in cardiovascular complications that can persist for up to 12 months.
- **Cardiopulmonary risk is often under-recognised,** particularly in patients without known cardiovascular disease.
- **The first exacerbation matters,** signalling increased future risk and a key opportunity for intervention.
- **Optimising COPD management reduces more than respiratory symptoms,** helping lower exacerbation frequency and associated cardiovascular risk.
- **GPs play a central role in identifying at-risk patients,** assessing cardiovascular risk, treating risk/early intervention, and coordinating care.

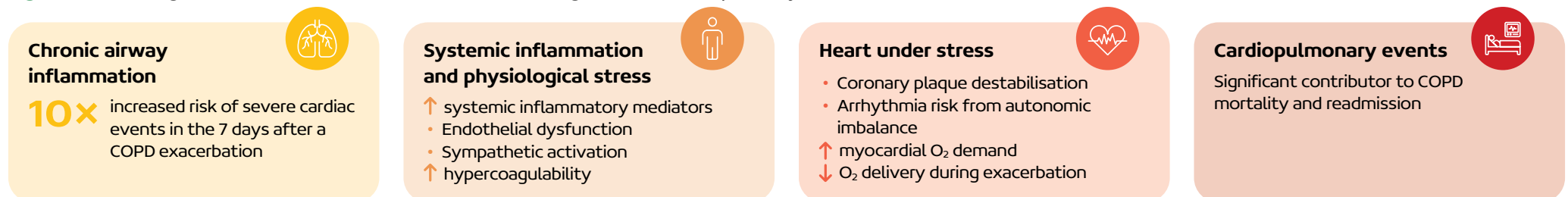
Why COPD is more than a lung disease

COPD remains a leading cause of death in Australia,¹ yet the condition is still widely viewed as a purely respiratory disease. In reality, many patients with COPD are more likely to die from cardiovascular disease (CVD) than from respiratory failure.^{2,3} This cardiopulmonary link is well-recognised in the evidence but often under-recognised in clinical practice.^{4,5} Understanding the systemic inflammatory burden of COPD, alongside the mechanical strain that exacerbations impose, is essential to reducing preventable cardiac and respiratory events.^{6,7}

COPD burden in Australia¹



Figure 1: From lung inflammation to heart events: understanding the COPD–CVD pathway^{8–11}



 **Key message:** Stabilising COPD protects the lungs – and the heart.^{11,12}

Why cardiopulmonary risk matters

Cardiopulmonary risk



Refers to the increased likelihood of people living with COPD experiencing **serious respiratory and/or cardiovascular events**, including death from these events.¹¹ Patients with known co-existing CVD are at particularly high risk of future cardiovascular events.



Occurs even in patients without known CVD¹³



Increases substantially during and after COPD exacerbations^{8,14}



Contributes to hospitalisations, re-admissions, and mortality¹⁵⁻¹⁷

Cardiopulmonary events associated with COPD^{7,11,19}



Acute coronary syndromes (ACS)



Arrhythmias, particularly atrial fibrillation



Heart failure (new onset or decompensation)



Ischaemic stroke



Why the connection is missed⁴

- COPD is usually managed as a respiratory issue rather than a systemic disease
- Symptoms like dyspnoea and chest discomfort overlap with cardiac presentations
- Competing priorities in short consultations can delay cardiac evaluation
- There is a lack of awareness of the systemic inflammatory link to CVD and that COPD is not included in the Australian CVD risk calculator.

Comorbidity of CVD and COPD in Australia¹



12%

of the 1.3 million Australians with CVD reported also having COPD in 2022



24%

of all Australians with COPD reported CVD as a comorbidity in 2023



7.6%

of deaths among people with COPD had heart failure listed as an associated cause of death in 2022



Both COPD and CVD share common risk factors for adverse outcomes (smoking, sedentary life-style, high blood pressure, systemic inflammation)^{4,9}



Clinical insight:

Cardiopulmonary risk increases even in patients without known CVD and after apparently mild exacerbations.¹³

COPD exacerbations: a critical turning point

A COPD exacerbation is an event characterised by worsening dyspnoea and/or cough and sputum that worsens within 14 days.^{12,20}

How COPD exacerbations drive cardiopulmonary risk

Exacerbations trigger acute cardiopulmonary stress⁹⁻¹¹

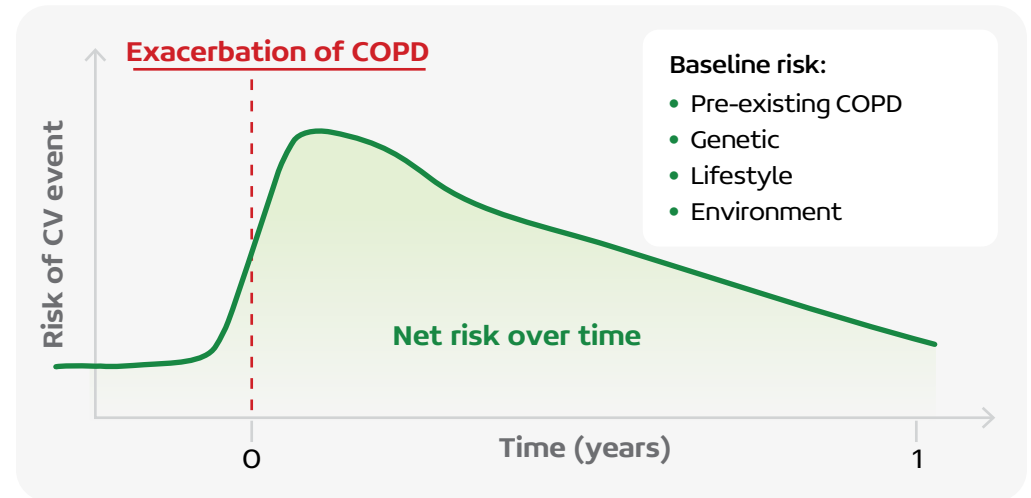
- Systemic inflammation intensifies, promoting endothelial dysfunction and plaque instability
- Hypoxia and hyperinflation increase myocardial workload while reducing oxygen delivery
- Autonomic imbalance and increased intrathoracic pressure raise the risk of arrhythmias and heart failure.

Risk persists beyond the acute event

Crucially, the increased risk of cardiovascular events extends beyond the acute exacerbation, persisting for weeks to months afterwards.^{8,14} This prolonged vulnerability highlights the importance of post-exacerbation review and follow-up in general practice.

Recognising cardiopulmonary risk helps shift COPD management from a reactive, symptom-based approach to a preventive strategy aimed at reducing both respiratory deterioration and major cardiovascular events.^{8,18}

Figure 2: Immediate and sustained cardiopulmonary risk following exacerbations^{8,14,21,24}



Key clinical takeaway:

- The risk of serious cardiopulmonary events rises sharply after a COPD exacerbation^{8,14}
- The first exacerbation often marks the start of accelerating disease progression^{8,14}
- Elevated and sustained risk persists for over 12 months, not just the acute phase.²¹



Implications for clinical practice:

Every exacerbation should prompt reassessment of both COPD management and cardiovascular risk.²²

Action points for GPs^{20,22}

Identify patients at higher cardiopulmonary risk

- History of ≥ 1 COPD exacerbation (especially in the past 12 months)
- Frequent symptoms despite treatment
- Known CVD or cardiovascular risk factors (e.g. hypertension, diabetes, smoking history, dyslipidaemia)
- New or unexplained chest discomfort, palpitations, syncope, orthopnea, paroxysmal dyspnoea, or reduced exercise tolerance
- Recent hospitalisation for COPD
- Consider screening for atrial fibrillation, given its prevalence and clinical impact in COPD

Proactively prevent exacerbations

- Optimise inhaler therapy in line with current COPD guidelines
- Check inhaler technique and adherence at every review
- Ensure appropriate vaccinations (influenza, pneumococcal, RSV, COVID-19 as relevant)
- Support smoking cessation with pharmacotherapy and referral where appropriate
- Educate patients on early recognition and reporting of symptom worsening
- Refer to pulmonary rehabilitation where appropriate

Consider cardiac risk assessment and referral

- Do not assume breathlessness is purely respiratory
- Use a CVD Risk Calculator (in those without known atherosclerotic CVD)²³
- Investigate or refer if symptoms suggest cardiac involvement
- Maintain low threshold for ECG, echocardiography, or cardiology referral following an exacerbation

Post-exacerbation review: a critical window for action

- Review COPD medications after any exacerbation or hospital discharge
- Step up treatment if required to reduce exacerbation risk and improve symptoms
- Confirm follow-up within weeks of discharge or acute treatment
- Refer to pulmonary rehabilitation to support return to physical activity, improve exercise tolerance, and rebuild cardiovascular fitness

Stabilise COPD to reduce long-term CVD risk

- Recognise exacerbation prevention as a cardiopulmonary risk-reduction strategy
- Aim for sustained symptom control and minimisation of future exacerbations
- Reinforce long-term management plans at every review

Case study: a first warning sign

Alex, a 68-year-old woman, presents with 3 days of worsening breathlessness, wheeze, and fatigue. She was diagnosed with moderate COPD six months ago following clinical assessment and spirometry. She has a former smoking history (45 pack-years) with hypertension and dyslipidaemia, but no known CVD. She is overweight and physically inactive. Current treatment is a short-acting bronchodilator as needed.

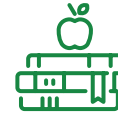
Alex reports this episode feels more severe than prior flare-ups, with new chest tightness on exertion, but no features suggestive of acute coronary syndrome. Examination shows tachypnoea, widespread wheeze, heart rate 104 bpm, and oxygen saturation 93% on room air. She is treated for her first documented COPD exacerbation with oral corticosteroids and antibiotics, with symptomatic improvement over the following week. No cardiac assessment (e.g. ECG or further cardiac evaluation) is undertaken.

Why this matters

A first COPD exacerbation represents a key inflection point for cardiopulmonary risk. Despite no prior CVD diagnosis, Alex's age, smoking history, and comorbid risk factors place her at increased risk of cardiovascular events, particularly in the weeks and months following an exacerbation.

This presentation highlights the opportunity for GPs to:

- recognise exacerbations as systemic events, not just respiratory
- consider underlying or unrecognised cardiac disease
- optimise COPD management to prevent further exacerbations and downstream cardiovascular risk.



Test your knowledge

Q1

Which statement best reflects the clinical significance of Alex's presentation?

Q2

Which factor in Alex's history most strongly contributes to her elevated cardiopulmonary risk, despite no formal CVD diagnosis?

Q3 Alex improves following treatment of her exacerbation. Which post-exacerbation action is most likely to reduce future cardiopulmonary risk?

Q4 Which mechanism best explains the increased risk of a cardiovascular event following a COPD exacerbation?

Q5 Which statement best describes the time course of the risk of a cardiovascular event following a COPD exacerbation?

Answers: 1. C. 2. A. 3. B. 4. B. 5. D.

Additional learning:

- The Limbic Collaborations: **Cardiovascular Risk in COPD**²⁵

References:

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