

# Understanding cardiopulmonary risk in COPD and opportunities for new treatment modalities

Emerging science is facilitating a better understanding of cardiopulmonary risk in patients with chronic obstructive pulmonary disease (COPD) as well as potential opportunities for new modalities and delivery mechanisms to reduce these cardiopulmonary events – a key driver of mortality in COPD.

Here Dr Pete Wilson, GP Partner and Site Principal Investigator, along with Yang Xu, Head of Medical Affairs Respiratory, AstraZeneca UK, discuss the potential for next-wave innovation to address cardiopulmonary risk to improve outcomes for COPD patients.



## Why is clinical research in COPD vital to drive meaningful change in patient outcomes?

**DR PETE WILSON (PW):** COPD is a leading cause of death – even moderate COPD exacerbations are associated with increased risks of further lung events, and severe cardiovascular complications have been shown to contribute to premature deaths.<sup>1</sup>

Just one COPD exacerbation doubles the risk of a heart attack and increases the risk of a stroke, hospitalisation and cardiopulmonary-related death.<sup>2,5</sup>

Large outcomes trials are pivotal to potentially transform the management of COPD by enhancing our understanding of disease drivers and opportunities for next-wave innovation to address these underlying causes of disease.<sup>6</sup>

## Can you summarise what cardiopulmonary risk in COPD is and why it is so important to address in patients?

**YANG XU (YX):** The lungs and heart are fundamentally linked and work together.<sup>7</sup> The presence and progression of cardiovascular disease (CVD) are triggering factors of COPD exacerbations in patients, while exacerbations in COPD patients can also trigger adverse cardiovascular events.<sup>8</sup> This elevated risk of both pulmonary and cardiac events in COPD patients has been termed 'cardiopulmonary risk'.<sup>9</sup>

Core mechanisms involved in COPD – such as inflammation, hyperinflation

and hypoxemia – elevate the risk of both lung and heart events, including COPD exacerbations, hospitalisations and severe or fatal cardiac events.<sup>10</sup> When coexistent, CVD is associated with adverse prognosis in COPD.<sup>11</sup> It is estimated that about one in five patients with COPD will have a cardiovascular cause of death.<sup>11</sup>

Patients with COPD are two to five times more likely to develop cardiovascular disease compared with the general population.<sup>12</sup> COPD is an important risk factor for atherosclerosis and even modest reductions in expiratory flow volumes can elevate the risk of ischemic heart diseases, strokes and sudden cardiac deaths, independent of other risk factors.<sup>13</sup>

## How does the burden of COPD in Europe underscore the urgent need to address pulmonary risk in patients?

**PW:** COPD is a major public health issue in Europe - as up to 10 percent of Europeans are living with moderate to severe COPD, a rise of over 60 percent in just 20 years.<sup>14</sup> In the UK alone, 1.4 million people are diagnosed with COPD and a further two million people are suspected to be living with undiagnosed COPD.<sup>15</sup> Outcomes for UK COPD patients are among the worst in Western Europe - nearly 30,000 people die from COPD each year, making it the second-greatest cause of death from lung disease and the UK's fifth-biggest killer.<sup>16,17</sup>

Approximately 20 percent of patients with COPD will die within a year of their first hospitalisation for an exacerbation, and cardiopulmonary events are a key driver of mortality and the most common reason for death in patients with COPD. Cardiopulmonary risk is significantly elevated after a COPD exacerbation and this increased risk may persist for up to a year following an exacerbation.<sup>5,18-20</sup>

In 2023, COPD cost the UK economy an estimated £1.9 billion.<sup>21</sup> COPD is under-prioritised, underfunded and undertreated.<sup>22</sup> The magnitude of the association of cardiovascular hospitalisation with COPD, as well as the risk of admission to hospital with myocardial infarction, heart failure and angina, is also greater with increasing severity of COPD.<sup>11</sup>

## How would you describe the current care and management of COPD in the UK?

**PW:** The UK has been highlighted as an outlier with higher mortality and morbidity rates attributed to respiratory disease compared to other Western countries in Europe, and this is something that needs to be addressed and prioritised.<sup>23</sup>

In many cases, COPD management can be regarded as suboptimal, as it is often more reactive than proactive. Moreover, there is a general perception of therapeutic inertia, defined as failure to escalate or initiate adequate therapy when treatment goals are not met. This is compounded by delayed diagnosis of COPD and insufficient awareness of cardiopulmonary risk.<sup>24</sup>

Given that for individuals with COPD the presence of cardiovascular disease increases mortality risk by up to 90 percent, there is an urgent need for earlier identification of patients at high risk and a more proactive and personalised approach to treatment in people living with cardiovascular disease, alongside recognition of COPD as a distinct cardiovascular risk factor.<sup>25,26</sup>

Acknowledgment of this unmet need has inspired a partnership working in the UK – The UK Cardiopulmonary Taskforce – to develop collaborative links between a multidisciplinary group of cardiac and respiratory healthcare professionals from primary and secondary care to understand and better manage cardiopulmonary risk in COPD.<sup>25</sup>

Addressing these needs will support symptom management and reduce future cardiopulmonary events through proactive escalation and optimisation of COPD therapy and management of cardiovascular conditions and risk factors.<sup>27</sup>

## How can cardiopulmonary risk be addressed to reduce mortality rates and what evidence and guidelines support this?


**YX:** A COPD exacerbation should be addressed and treated with a similar sense of urgency to a heart attack or stroke.<sup>28</sup> Even newly diagnosed patients must be considered at risk of cardiopulmonary events.<sup>29</sup> COPD exacerbations amplify the drivers of cardiopulmonary risk, elevating the likelihood of a future exacerbation along with pulmonary and cardiac events, and must be viewed as critical lung events that require prevention.<sup>30</sup> Even moderate COPD exacerbations are associated with increased risks of further lung events and severe cardiovascular complications, which have been shown to contribute to patients dying.<sup>31,32</sup>

Optimising COPD treatment may confer cardiopulmonary protection. Inhaled corticosteroids (ICS) could reduce inflammation in the lungs, and bronchodilators, which decrease airway resistance and reduce hyperinflation, could improve inspiratory capacity, reducing residual volume and potentially improving cardiac function.<sup>27</sup>

While symptom burden and exacerbations are common among treated patients, poor adherence to inhaler therapy is a frequent challenge. The quantity and variety of different inhaler delivery devices for COPD pose unique challenges for self-management, particularly in an ageing population with dexterity and visual limitations.<sup>33</sup>

A proactive approach paired with earlier therapeutic intervention is supported by a growing body of scientific evidence and momentum in the clinical community to address cardiopulmonary risk, prevent exacerbations, and ultimately lower the risk of premature death.<sup>26</sup>

The 2024 GOLD report notes the treatment effect of non-pharmacologic interventions and fixed-dose triple combination therapies on mortality, and calls for a more proactive therapeutic approach to improve COPD outcomes.<sup>26</sup>

By fundamentally shifting treatment paradigms to a more proactive approach, we can improve prognosis in COPD for the millions of people affected, helping them live healthier, longer and more active lives.<sup>26,34</sup> 

ALL REFERENCES CAN  
BE VIEWED HERE



**Dr Pete Wilson,  
MB ChB MRCGP**

GP Partner and Site  
Principal Investigator, The  
Middlewood Partnership



**Yang Xu**

Head of Medical Affairs  
Respiratory at  
AstraZeneca UK

AstraZeneca provided input into the development of the article. EPR had final editorial control.