THE CLEAN BREATHING INSTITUTE

HOW DOES AIR POLLUTION AFFECT RESPIRATORY HEALTH?

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WHAT IS THE ROLE OF THE RESPIRATORY TRACT IN MAINTAINING HEALTH?

The **upper respiratory tract** and more specifically **the nose** is the **first line of defence** against air pollutants.[1] The nose has several innate defence mechanisms, such as mucociliary clearance, which traps and removes hazardous components of inhaled air including certain air pollutants, bacteria and viruses.[2]

The impact of the different components of air pollution on the respiratory tract is dictated by their **particle size, water solubility and chemical reactivity**.[1] Larger particles such as dust may be filtered by the nose, whereas smaller particles such as diesel exhaust can reach the lower respiratory tract.[1] Several mechanisms have been implicated in the adverse impact of air pollutants, including **oxidative stress**, **alterations in immune function,** and **increased susceptibility to upper respiratory tract infections** (Figure 1).[3–5]

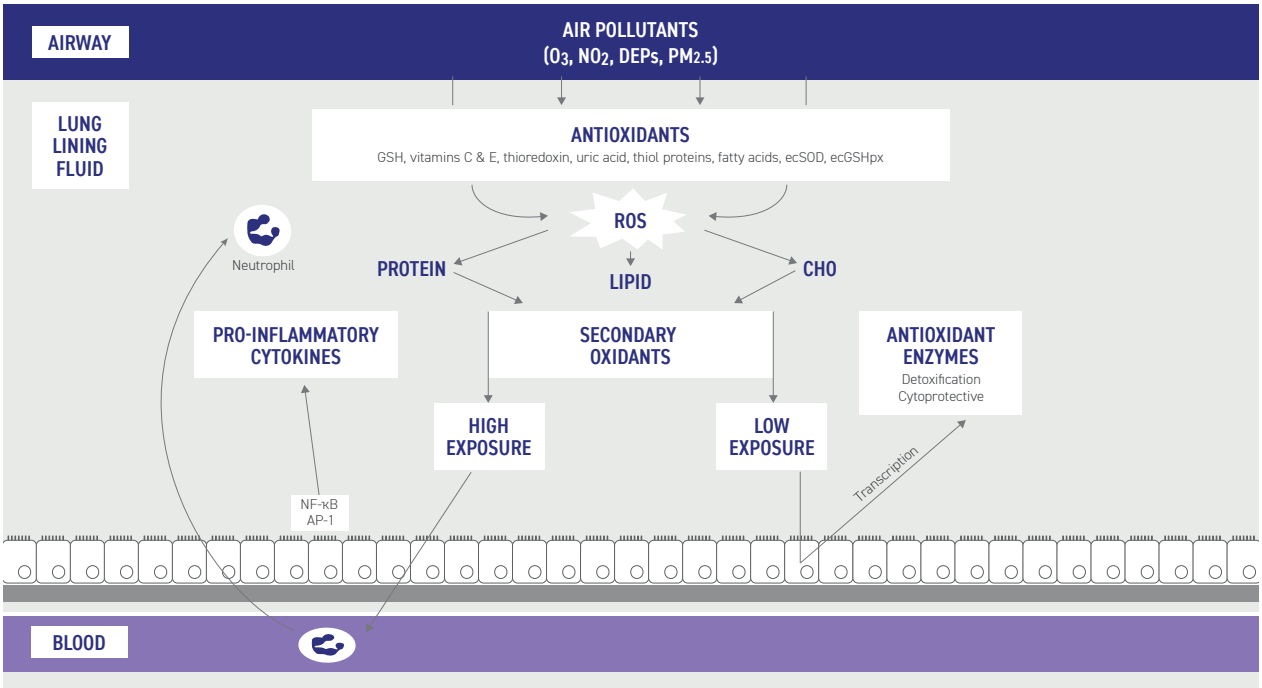

FIGURE 1. MODEL OF OXIDATIVE STRESS MECHANISMS AND EFFECTS ON THE AIRWAY[4]

WHAT ARE THE SYMPTOMS FOLLOWING EXPOSURE TO AIR POLLUTION?

Nose and throat symptoms are among the **most commonly reported upper respiratory tract symptoms** following exposure to air pollution, along with **increased risk of infection**.[1,2] These may include non-allergic rhinitis, sinusitis, runny nose, nasal congestion, sneezing, cough, wheezing, and dyspnoea.[1,2]

WHO IS AT INCREASED RISK FROM THE EFFECTS OF AIR POLLUTION?

Individuals with **pre-existing conditions such as lung or heart disease**, **the elderly**, **pregnant women and children** are susceptible to the risks of air pollution.[6–8] **Exacerbations and hospitalisations** for diseases such as asthma can increase with exposure to air pollution.[8] Maternal exposure to air pollution has been associated with an increased risk of developing **asthma, rhinitis and eczema** in children.[6] Air pollution can also increase **mortality from respiratory and cardiopulmonary causes** in the elderly.[7]

KEY REFERENCES

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