

# RSV Linked to Increased Cardiovascular Risk, Prevention Explored

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While primarily recognised as a respiratory pathogen, accumulating evidence indicates that respiratory syncytial virus (RSV) infection may contribute to an increased risk of cardiovascular events. This observation necessitates a broader clinical perspective on RSV, moving beyond its pulmonary sequelae to consider its systemic impact and the potential for cardiovascular risk reduction through prevention.

## KEY TAKEAWAYS

- **The Pivot:** RSV infection is now understood to be associated with an elevated risk of subsequent cardiovascular events, not solely a respiratory illness.
- **The Data:** Post-RSV infection, patients may experience a heightened risk of myocardial infarction, stroke, and heart failure exacerbation.
- **The Action:** Clinicians should consider RSV prevention strategies, particularly in vulnerable populations, as a potential intervention for reducing cardiovascular morbidity.

Respiratory syncytial virus (RSV) is a common cause of acute respiratory tract infections, particularly in infants, young children, and older adults. Its clinical presentation typically ranges from mild, cold-like symptoms to severe bronchiolitis and pneumonia, often requiring hospitalisation. However, the systemic inflammatory response triggered by RSV infection extends beyond the respiratory system, influencing various physiological processes, including cardiovascular function.

The acute phase of RSV infection can induce significant physiological stress. This stress manifests as increased metabolic demand, hypoxemia, and a heightened systemic inflammatory state, characterised by elevated circulating cytokines such as interleukin-6 (IL-6) and C-reactive protein (CRP). These inflammatory mediators are known to play a role in the pathogenesis of acute coronary syndromes and other cardiovascular events. Furthermore, RSV has been implicated in direct myocardial injury, with studies demonstrating viral presence in cardiac tissue and associations with myocarditis and pericarditis during acute infection.

## Cardiovascular Sequelae Post-RSV Infection

Observational studies have consistently reported an association between acute respiratory infections, including RSV, and an increased incidence of cardiovascular events in the weeks and months following infection. For instance, data indicates a transient but significant increase in the risk of myocardial infarction (MI) and stroke following respiratory infections. This elevated risk is thought to be mediated by several mechanisms: plaque destabilisation due to systemic inflammation, increased thrombogenicity, and direct viral effects on vascular endothelium. Patients with pre-existing

cardiovascular conditions, such as coronary artery disease, heart failure, or atrial fibrillation, appear to be particularly susceptible to these post-infectious complications. In these vulnerable populations, RSV infection can precipitate acute decompensation of heart failure or trigger arrhythmias. The burden of RSV-associated hospitalisations in older adults is substantial, and a significant proportion of these admissions involve cardiovascular complications or exacerbations of underlying cardiac disease.

The long-term implications of RSV infection on cardiovascular health are also a subject of ongoing investigation. While the immediate post-infection period carries the highest risk, persistent inflammation or subtle myocardial damage could potentially contribute to chronic cardiovascular morbidity. Understanding these extended effects is critical for fully appreciating the public health impact of RSV.

### **The Case for Prevention**

Given the established link between RSV infection and adverse cardiovascular outcomes, particularly in high-risk groups, prevention strategies warrant consideration as a means of cardiovascular risk reduction. Current preventive measures for RSV include monoclonal antibody prophylaxis for high-risk infants and, more recently, novel vaccines approved for older adults and pregnant individuals. These interventions primarily aim to reduce the incidence and severity of respiratory disease. However, their potential to mitigate cardiovascular risk represents an additional, often overlooked, benefit.

Vaccination against RSV in older adults, for example, could not only reduce hospitalisations for respiratory illness but also potentially decrease the incidence of post-RSV cardiovascular events. This broader protective effect underscores the value of integrating RSV prevention into comprehensive care plans for individuals at high risk of cardiovascular disease. Further research is needed to quantify the precise reduction in cardiovascular events attributable to RSV vaccination and prophylaxis, which would strengthen the evidence base for these interventions as cardiovascular protective strategies.

### **Clinical Implications and Future Directions**

For healthcare professionals, recognising the cardiovascular implications of RSV infection is paramount. This awareness should prompt a lower threshold for cardiovascular assessment in patients, especially older adults and those with pre-existing cardiac conditions, presenting with RSV symptoms. Monitoring for signs of cardiac decompensation, arrhythmias, or acute coronary syndromes during and after RSV infection should be integrated into clinical practice. Furthermore, patient education regarding the potential cardiovascular risks associated with RSV, alongside the benefits of preventive measures, is crucial.

While current evidence strongly suggests a link between RSV and cardiovascular events, several areas warrant further investigation. Large-scale, prospective studies are needed to precisely quantify the long-term cardiovascular sequelae of RSV infection across different age groups and patient populations. Research into the specific molecular mechanisms by which RSV impacts cardiovascular tissue and function could lead to targeted therapeutic interventions. Additionally, pharmacoeconomic analyses that incorporate the cardiovascular benefits of RSV vaccination and prophylaxis would provide a more complete picture of their value, potentially influencing public health policy and reimbursement decisions.

The evolving landscape of RSV prevention offers a unique opportunity to address a significant, yet often underappreciated, contributor to cardiovascular morbidity and mortality. Integrating RSV prevention strategies into cardiovascular risk management protocols represents a proactive approach to improving patient outcomes and reducing the overall burden of cardiovascular disease.

#### CLINICAL IMPLICATIONS

The emerging understanding of RSV's cardiovascular implications should prompt a re-evaluation of its clinical significance. For too long, RSV has been pigeonholed as a paediatric respiratory threat, with adult infections often dismissed as 'just a cold.' This perspective is no longer tenable, especially for older adults and those with pre-existing cardiovascular conditions. Clinicians should now consider RSV prevention, through available vaccines or monoclonal antibodies, not merely as a respiratory health measure but as a potential tool in the cardiovascular risk reduction armamentarium. The discussion around RSV vaccination in eligible patients should explicitly include the potential to avert myocardial infarction, stroke, or heart failure exacerbation, alongside the more obvious benefit of preventing severe respiratory illness.

The pharmaceutical industry, having successfully brought RSV vaccines to market, now has an opportunity to further differentiate these products. Beyond demonstrating efficacy in reducing respiratory hospitalisations, future clinical trials and real-world evidence studies should rigorously quantify the reduction in cardiovascular events. This data would provide a compelling argument for broader uptake and potentially influence guideline bodies to incorporate RSV vaccination into cardiovascular prevention recommendations, similar to how influenza vaccination is currently advised for cardiac patients. Payers, too, will need to recognise the broader economic and health system benefits of preventing not just respiratory admissions, but also costly cardiovascular events.

Ultimately, patients, particularly those with a history of cardiovascular disease, need to be informed about this expanded risk. A simple respiratory infection could have serious cardiac consequences. Empowering patients with this knowledge, coupled with accessible and affordable prevention options, is essential. It is a reminder that the interconnectedness of physiological systems means that a 'simple' viral infection can have far-reaching and complex effects, demanding a holistic approach to patient care and public health.

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