

# Lung Infections from Inhaled Steroids in Respiratory Patients

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## DESCRIPTION

Inhaled Corticosteroids (ICS) are commonly prescribed to patients with respiratory conditions like asthma and Chronic Obstructive Pulmonary Disease (COPD) to reduce inflammation and manage symptoms. These medications are effective in improving breathing and preventing flare-ups, but recent research has raised concerns about the potential for an increased risk of developing Non-Tuberculous Mycobacterial (NTM) lung infections. ICS are commonly prescribed to patients with respiratory conditions like asthma and COPD to reduce inflammation and manage symptoms. These medications are effective in improving breathing and preventing flare-ups, but recent research has raised concerns about the potential for an increased risk of developing NTM lung infections. Inhaled corticosteroids are a mainstay treatment for chronic respiratory conditions like asthma and COPD. These medications work by reducing inflammation in the airways, making it easier for patients to breathe and preventing exacerbations. They are delivered directly into the lungs *via* an inhaler, which limits some of the systemic side effects associated with oral corticosteroids. For many patients, ICS can be life-changing, helping to control symptoms, improve quality of life, and reduce the need for emergency interventions. However, like all medications, they come with risks, and long-term use, particularly in high doses, has been associated with several adverse effects, including an increased susceptibility to infections.

### Increasing risk of NTM infections through inhaled steroids

Recent studies have shown a concerning link between the use of inhaled corticosteroids and an increased risk of NTM lung infections. One of the primary reasons for this is that corticosteroids suppress the immune system, which can make the lungs more vulnerable to bacterial infections, including NTM. Inhaled steroids, though localized to the airways, can still suppress local immune responses. This reduction in immunity can allow NTM bacteria, which are typically harmless to most people, to colonize the lungs and cause infection. The

immunosuppressive effect of steroids can be particularly problematic in patients who already have underlying lung conditions like COPD or bronchiectasis, which can create a more favorable environment for NTM bacteria to thrive. Several studies have demonstrated a dose-dependent relationship between inhaled steroid use and NTM infections. Higher doses of ICS, especially over long periods, seem to correlate with a greater risk of developing these infections. Additionally, patients with severe respiratory conditions who are more dependent on inhaled steroids are often the ones most at risk for NTM lung disease. While anyone using inhaled corticosteroids could theoretically be at risk for NTM infections, certain populations are more vulnerable than others. Patients with COPD or bronchiectasis, a condition characterized by permanent enlargement of parts of the airways, are at especially high risk. These patients often have already compromised lung function, which, when combined with the immune-suppressing effects of steroids, makes them more susceptible to infections. Additionally, older adults, who are more likely to suffer from chronic lung conditions and have weaker immune systems, may face a higher risk of developing NTM infections when using inhaled steroids. People with other underlying immune system deficiencies are also at greater risk.

### Symptoms and prevention of NTM lung infections

Patients using inhaled steroids should be aware of the symptoms of NTM lung infections so they can seek early intervention if needed. Common symptoms include, persistent cough, shortness of breath, fatigue and weakness, chest discomfort, unexplained weight loss, night sweats. These symptoms can be subtle and may overlap with the symptoms of other lung conditions, which makes diagnosing NTM infections challenging. Early diagnosis and treatment are crucial to preventing the progression of the infection, which can cause significant lung damage over time. For patients who require inhaled corticosteroids to manage their respiratory conditions, the key to preventing NTM infections lies in careful risk management. Doctors may consider using the lowest effective dose of ICS and regularly monitoring patients for signs of

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infection, especially those in high-risk groups. Additionally, healthcare providers may explore alternative treatment options or adjust steroid dosages for patients with a history of recurrent lung infections. Regular lung function tests and imaging studies can help detect any early signs of infection, allowing for prompt treatment. Patients should also take proactive steps to reduce their exposure to NTM bacteria, such as avoiding hot tubs, minimizing contact with soil, and using filtered water in humidifiers or nebulizers.

## CONCLUSION

Antimicrobial resistance in the gut is a serious concern, but it is possible to address it without disrupting microbiome diversity.

Through the careful use of antibiotics, the incorporation of probiotics and prebiotics, exploration of alternative therapies, and lifestyle modifications, we can protect the gut microbiome while also reducing the spread of AMR. By preserving the natural balance of microorganisms in the gut, we can maintain overall health and mitigate the risks posed by antibiotic resistance.