Advancing respiratory care: Asthma, lung cancer screening.

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Introduction

Long-acting bronchodilator-based combination therapies are crucial for asthma management, providing sustained bronchodilation, reducing exacerbation rates, and improving overall control, often alongside inhaled corticosteroids. Personalized treatment based on disease severity and patient response, combined with adherence, is essential for optimal outcomes in respiratory care [1].

Respiratory Therapists (RTs) play a vital role in Low-Dose Computed Tomography (LDCT) lung cancer screening programs. They significantly contribute to patient education, Shared Decision-Making (SDM), smoking cessation counseling, and follow-up care coordination. Leveraging their expertise can enhance screening uptake and program efficiency, ultimately leading to earlier detection and better patient outcomes [2].

Digital health interventions, including mobile apps and remote monitoring systems, have a significant impact on asthma management. These tools effectively improve asthma control, reduce emergency visits, and enhance medication adherence. This highlights technology's potential to empower patients in self-managing their condition, supplementing traditional clinical care and offering new avenues for respiratory therapy [3].

Personalized medicine approaches in asthma focus on targeting Type 2 inflammation with biologics and optimizing bronchodilator use. Phenotyping and endotyping asthma patients guide treatment decisions, ensuring therapies are tailored to individual inflammatory pathways. Integrating biologics with bronchodilators, informed by precision diagnostics, can significantly improve control for those with severe asthma [4].

Research into blood-based biomarkers for lung cancer screening aims to identify non-invasive methods for early detection. Various circulating markers, such as proteins, nucleic acids, and autoantibodies, are evaluated for their sensitivity and specificity in distinguishing cancerous from benign nodules. Promising candidates could complement or enhance existing LDCT screening, improving risk stratification and reducing false positives [5].

Airway Clearance Techniques (ACTs) are assessed for their efficacy in asthma management. Techniques like positive expiratory pressure, oscillating positive expiratory pressure, and high-frequency chest wall oscillation are explored for their ability to improve mucus clearance and lung function. While ACTs are common in respiratory therapy for other conditions, clearer benefits for their routine use in asthma require more robust research [6].

Allergen immunotherapy's impact on bronchodilator use in allergic asthma patients is also a key area of study. Specific immunotherapy can reduce the need for short-acting or long-acting bronchodilators over time. This indicates that allergen immunotherapy may have a disease-modifying effect beyond symptomatic relief, offering a long-term management strategy for allergic asthma [7].

Shared Decision-Making (SDM) is crucial in lung cancer screening, with various interventions enhancing patient understanding, decision quality, and participation. Effective SDM processes empower individuals to make informed choices about screening, considering personal values and preferences alongside clinical risks and benefits, thus enhancing patient-centered care [8].

Comprehensive recommendations for managing severe asthma exacerbations in adults are provided by official guidelines. These cover assessment, pharmacological interventions (including bronchodilators and systemic corticosteroids), and respiratory support strategies. Rapid recognition and tailored treatment are emphasized to prevent respiratory failure and minimize adverse outcomes, reflecting evidence-based acute respiratory care practices [9].

Home-based respiratory therapy interventions for chronic respiratory diseases are also being investigated for their effectiveness. These interventions include telehealth-supported pulmonary rehabilitation, remote monitoring, and home oxygen therapy management. Shifting care to the home environment can improve patient independence, reduce hospitalizations, and enhance quality of life, signifying a growing trend in personalized and accessible respiratory care [10].

Conclusion

The landscape of respiratory care is evolving, with significant ad-

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vancements in both asthma management and lung cancer screening. For asthma, research highlights the effectiveness of long-acting bronchodilator-based combination therapies, often with inhaled corticosteroids, in providing sustained relief and reducing exacerbations, underscoring the importance of personalized treatment and adherence for optimal outcomes. Personalized medicine approaches further refine asthma care by targeting Type 2 inflammation with biologics and optimizing bronchodilator use, guided by patient phenotyping and endotyping. Digital health interventions, such as mobile apps and remote monitoring, are proving effective in improving asthma control, medication adherence, and reducing emergency visits, empowering patients in self-management. Allergen immunotherapy shows promise in reducing bronchodilator reliance, suggesting a disease-modifying effect. While Airway Clearance Techniques (ACTs) are explored, more robust research is needed to establish their clear benefits in routine asthma management. Guidelines for severe asthma exacerbations emphasize rapid recognition and tailored pharmacological and respiratory support. In lung cancer screening, Respiratory Therapists (RTs) play a critical role in patient education, Shared Decision-Making (SDM), and smoking cessation, enhancing screening uptake and efficiency. Investigations into blood-based biomarkers offer non-invasive methods to complement existing Low-Dose Computed Tomography (LDCT) screening, potentially improving risk stratification. SDM processes are crucial for empowering informed choices in screening. Moreover, home-based respiratory therapy interventions, including telehealth-supported pulmonary rehabilitation and remote monitoring, are improving patient independence and reducing hospitalizations for chronic respiratory diseases.

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