CONSENSUS GUIDELINE

Consensus Recommendations on Home Maintenance Nebulization with Focus on Obstructive Airway Diseases: An Update on Best Practices and Future Directions

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Asthma and chronic obstructive pulmonary disease (COPD) are obstructive airway diseases (OADs) that contribute significantly to the burden on healthcare systems in low- and middle-income countries like India.[1,2] Inhaler therapy (primarily involving pressurized metered-dose inhalers and dry powder inhalers) remains the cornerstone of maintenance therapy; however, not all patients can use them effectively.[3] Home maintenance nebulization (HMN) has been increasingly used as an alternative in appropriately identified patients, particularly those with advanced disease, physical or cognitive limitations, or suboptimal inspiratory flows. This expert consensus is an update from the 2017 recommendations, which provide evidence-informed recommendations on the use of HMN in OADs.[4] By incorporating recent research findings and clinical expertise, the updated consensus addresses current gaps in knowledge, optimizes therapeutic protocols, and supports healthcare providers in delivering high-quality, patient-centered care. It is aimed at aiding clinicians involved in the management of OADs, including asthma and COPD, and evaluating the suitability of nebulization therapy as long-term maintenance treatment in home care settings.

This consensus recommendation has been developed using the traditional method of consensus development and addresses patient selection criteria, appropriate drug-device combinations, therapy duration, adherence monitoring, and infection control practices. The message given by the panel clearly states that HMN should not replace handheld inhalers indiscriminately but should be considered only in specific situations, which have been clearly called out in the document. The various types of nebulizers that can be used for the management of OAD patients, along with their advantages and disadvantages, and the appropriate drugs that can be used as a part of HMN have been comprehensively detailed.

The panel has given the recommendations for the effective use of HMN (Table 1).

The panel has also shared its views on the future developments in nebulization therapy, which aim at making nebulization therapy more effective, user-friendly, and tailored to individual patient needs, ultimately improving the management of chronic respiratory conditions.

Conclusion

Home nebulization is a critical component of respiratory disease management, offering convenience and improved medication adherence for patients with chronic conditions as a valuable alternative for drug delivery, though it should not be viewed as a substitute for handheld inhalers. Ensuring proper usage technique, monitoring adverse effects, and providing individualized treatment plans are essential for maximizing the benefits of home nebulization therapy. Future research should focus on evaluating long-term efficacy, patient-reported outcomes, and technological advancements in nebulization devices. By adhering to evidence-based recommendations, healthcare providers can enhance the safety and effectiveness of home-based respiratory therapy, ultimately improving patients' quality of life. These recommendations should be viewed as a reference by practicing clinicians for prescribing maintenance nebulization.

Table 1: Recommendations for the use of Home Maintenance Nebulization (HMN)

S. No.	*Consensus recommendation*
1.	HMN should be defined as the physician-prescribed administration of long-term maintenance medications in nebulized form (≥3 weeks) in appropriately selected patients within a properly managed home environment.
2.	Selecting patients for maintenance nebulization requires a thorough clinical evaluation of disease severity, treatment response, cognitive status, and individual patient needs (dexterity, coordination, assistance availability, comorbidities, and symptom burden). The physician should determine the duration of maintenance nebulization and assess the possibility of introducing handheld inhalers whenever possible. Regular evaluations are essential to ensure treatment adherence and optimize patient outcomes.
3.	The minimum duration for maintenance nebulization in patients with OADs should be at least 3 weeks, but the maximum duration remains undefined and should be individualized based on disease severity, treatment response, safety concerns, and patient needs. The prescribing physician must regularly assess therapy effectiveness and safety to determine its continuation or discontinuation.
4.	The selection of a nebulizer for maintenance therapy should be individualized based on drug compatibility, particle size, ease of use, patient-specific factors, and cost-effectiveness to achieve optimal drug delivery and adherence. Prescribers are advised to refer to the exact indications, posology, and administration methods available in the prescribing information of the selected drugs.
5.	Regular monitoring of symptoms, lung function, and nebulizer techniques are keys to measuring the effectiveness of treatment. Adherence to therapy and infection control measures should be reinforced through routine follow-ups to attain better patient outcomes.
6.	Patients/caregivers should be advised to follow aseptic techniques, clean accessories every day, disinfect weekly, store parts in a dry environment, and replace components as per manufacturer guidelines.
7.	The effectiveness of maintenance nebulization should be assessed through factors such as effectiveness of the treatment (objective and subjective), treatment adherence, and symptom monitoring.
8.	Patients on maintenance nebulization should receive proper training on device use, assembly, and cleaning, with regular reassessment to prevent technique errors. Special precautions, including infection control measures and patient-specific considerations, should be strictly followed to ensure safety and efficacy.
9.	Maintenance nebulization should be discontinued when patients show significant symptom improvement, can effectively use inhalers, or experience adverse effects. Transitioning to inhalers should be gradual, with proper training, close monitoring, and continued education to ensure effective symptom control and adherence.
10.	Beyond OADs, maintenance nebulization plays a crucial role in treating various diseases/conditions, including structural lung diseases, lower respiratory infections, pulmonary hypertension, and in palliative care. The physician's judgment is essential in determining the need for maintenance therapy.
11.	Well-trained caregivers assist in medication administration, equipment maintenance, and symptom monitoring. Structured training programs and emotional support to caregivers can improve caregiver effectiveness and reduce burnout.
12.	While using nebulizers in patients on noninvasive ventilation (NIV), ensure to use them between NIV cycles. Selection of an appropriate interface and dose adjustments after carefully following manufacturer guidelines are important. Avoid using oxygen-driven nebulizers at home.

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