Title: Equipment Required for Medication Nebulization: Safety and Guidelines

Date: May 5, 2014

Research Questions

1. What is the clinical evidence regarding the safety of using wall oxygen for medication nebulization?

2. What is the clinical evidence regarding the risk of infection associated with the use of wall oxygen for medication nebulization?

3. What are the evidence-based guidelines regarding the equipment required for medication nebulization?

Key Message

Four evidence-based guidelines were identified regarding the equipment required for medication nebulization.

Methods

A limited literature search was conducted on key resources including PubMed, MEDLINE, The Cochrane Library (2014, Issue 4), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval of questions #1 and #2 by study type; however a guideline methodological filter was applied to question #3 to limit retrieval to guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and April 21, 2014.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Four evidence-based guidelines were identified regarding the equipment required for medication nebulization. No literature was identified regarding the safety or risk of infection associated with the use of wall oxygen for medication nebulization.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

Four evidence-based guidelines were identified that mentioned the equipment required for medication nebulization. All guidelines suggested that the choice of device for aerosol delivery of medication to treat asthma or chronic obstructive pulmonary disease (COPD) should depend on several factors, including patient capacity and preference, the ability to administer the prescribed drug with a particular device, and device cost. Patients should receive appropriate training on the correct operation of the chosen device.

The American Association of Respiratory Care recommends both nebulizers and pressurized metered-dose inhalers (pMDIs) with a valved holding chamber for children under age 4 and for adults who cannot manage other devices, while use of dry-powder inhalers (DPIs) should be limited to patients over the age of 4 with adequate flow to use this device. However, the British Guideline on the Management of Asthma states that for children aged 0-5, pMDIs and spacers provide the preferred mode of inhaled drug delivery, unless ineffective in which case a nebulizer can be used.

The American College of Chest Physicians/American College of Asthma, Allergy and Immunology recommend both nebulizers and pMDIs with spacers/holding chambers for the delivery of aerosolized beta2 agonists in the treatment of asthma or COPD in both the emergency department and inpatient settings. Another guideline states that children and adults experiencing mild to moderate episodes of acute asthma should be treated using a pMDI and spacer, while oxygen-driven nebulization is recommended for life-threatening episodes of acute asthma. Two guidelines recommend both nebulizers and pMDIs for aerosol drug delivery during noninvasive or mechanical ventilation.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials
No literature identified.

Non-Randomized Studies
No literature identified.

Guidelines and Recommendations


See Section 5 – Inhaler Devices and Section 6.3 – Treatment of Acute Asthma in Adults


See Section 1.2.2 – Nebulisers and Section 1.3.5 – Delivery systems for inhaled therapy during exacerbations

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APPENDIX – FURTHER INFORMATION:

Randomized Controlled Trials – Unclear Source of Oxygen-driven Nebulization


Guidelines and Recommendations – Unclear Methodology

See Section B. Respiratory Medication Delivery Systems, pg 6


Review Articles


   PubMed: PM21560711

   PubMed: PM19559658