Ventilation systems in operating rooms a health technology assessment

Danish Centre for Evaluation and Health Technology Assessment (DACEHTA)

Record Status
This is a bibliographic record of a published health technology assessment from a member of INAHTA. No evaluation of the quality of this assessment has been made for the HTA database.

Citation

Authors' conclusions
The conclusions of the report express the consensus of the experts on the design, results and quality of the evidence of each article. This consensus is based on checklists, evidence tables and an overall assessment of the quality of the evidence. The chapter of the report on technology reviews the literature regarding three key questions. 1. Is there evidence indicating that ventilation systems using turbulent air flow differ from those using laminar air flow in the incidence of infection after surgery? 2. Is there evidence indicating that ventilation systems using turbulent air flow differ from those using laminar air flow in their ability to produce ultraclean air in the surgical field? 3. Is there evidence indicating that the presence of ultraclean air versus less pure air in the surgical field is associated with the incidence of infection after surgery? The assessment of the literature in the report found the following. 1. Based on all the large and well-executed cohort studies reviewed, the report concludes that inserting joint prostheses in laminar air flow ventilation does not lead to a lower frequency of infection than in turbulent air flow ventilation. Each study individually provides moderate evidence, and well-executed randomized controlled trials in this field are lacking. Moderate evidence indicates that the initial insertion of a hip prosthesis is associated with unchanged or greater incidence of infection if this is carried out using laminar air flow versus turbulent air flow ventilation. 2. Moderate evidence indicates that both laminar air flow and turbulent air flow ventilation can be designed to produce ultraclean air with a concentration of microorganisms complying with the recommended limit value. Nevertheless, moderate evidence indicates that, using laminar air flow, the linear filtered air streams are perturbed by colliding with, for example, surgical lamps and people, and that this may result in increasing the number of bacteria-carrying particles in the surgical field. Moderate evidence indicates that using turbulent air flow ventilation can reduce the concentration of bacteria-carrying particles in the surgical field and that existing standards can be complied with by controlling the number of people in the room, optimizing the particle permeability of surgical gowns and by increasing the air circulation in the room. 3. A clinical study provides moderate evidence that ventilation with ultraclean air versus less pure air is not associated with the contamination of surgical wounds. No study has been found that can confirm any association between ventilation with ultraclean air versus less pure air and the incidence of deep infection after surgery.

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