



KEY POINT SUMMARY

OBJECTIVES

To review the available literature concerning periprosthetic joint infections so that new methods to reduce them can be proposed.

Environment of care: Is it time to reassess microbial contamination of the operating room air as a risk factor for surgical site infection in total joint arthroplasty?

Parvizi, J., Barnes, S., Shohat, N., Edmiston, C. E. 2017 | American Journal of Infection Control, Volume 45, Issue 11, Pages 1267-1272

Key Concepts/Context

Operating rooms (ORs) typically are equipped with several layers of defense against the spread of airborne contaminants (also known as airborne microbial populations) that can lead to surgical site infections (SSIs) in patients undergoing surgical procedures that involve device implantation. Periprosthetic joint infections (PJIs), which can occur in patients undergoing surgery for joint replacement, often lead to particularly high rates of personal and fiscal morbidity for patients. The causes behind PJIs and the methods for avoiding them are in need of further research. The authors wish to review the available literature concerning PJIs in order to propose innovative strategies to help mitigate these infections.

Methods

The authors performed a literature review by accessing the following databases: MEDLINE, PubMed, INAHTA, and Cochrane Database of Systematic Reviews. Review results were categorized into themes discussed within this article, which are: Evidence supporting the association between airborne microbes and surgical site infection, current OR standards for reduction of microbial aerosol, surgical helmet system, UV plus HVAC systems, egg crate upper-room UV germicidal irradiation, HEPA and UV air recirculation system, UV-C, continuous, air purification system, and ultraclean ventilation systems combining laminar airflow and high-efficiency particulate air filters.



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Findings

Literary analysis found that many documented practices for limiting traffic in and out of operating rooms have not succeeded in reducing the risk of PJIs. Further, the authors suggest that there seems to be confusion among the medical community as to how and why airborne microbial populations are especially dangerous to patients receiving device-implant surgery in the first place. This leads the authors to suggest that institutions should invest in novel air purification technologies, while researchers should focus on specific HVAC-implemented designs. In sum, the authors question why it would not be possible for OR environments to strive for air quality standards akin to those maintained in other industries, such as computer chip and drug manufacturing.

Limitations

This study is a literature review; all conclusions are drawn from quantitative and qualitative data derived from previous studies. Other databases and key terms could have been used to further expand the scope of the authors' research into this subject.

Design Implications

While this article suggests that there is still much work to be done in the field of reducing airborne contaminants in surgical operating rooms, designers can continue implementing HVAC systems and operating room designs that have been shown to help.

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