SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The authors focused on how the surgical environment could be optimized to reduce the frequency of SSIs in the study setting. This study investigated the air quality during orthopedic trauma surgery in a displacement-ventilated OR; explored how traffic flow and the number of persons present in the OR affects the air contamination rate in the vicinity of surgical wounds; and identified reasons for door openings in the OR.

Traffic Flow in the Operating Room: An Explorative and Descriptive Study on Air Quality During Orthopedic Trauma Implant Surgery

Andersson, A.E., Bergh, I., Karlsson, J., Eriksson, B.I. MD, Nilsson,K.
2012 | Journal of Infection Control
Volume 40, Issue 8, Pages 750-755

Key Concepts/Context

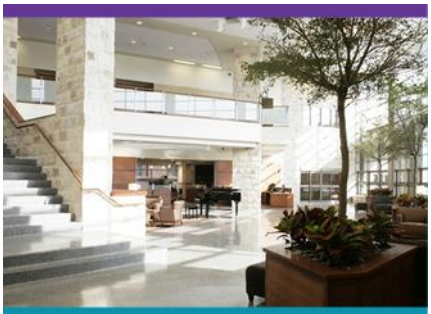
Three main strategies exist to prevent surgical site infections following surgery: 1) the patient, 2) the surgical technique, 3) the surgical environment. This study focuses on optimizing the effect of the surgical environment in preventing SSIs (surgical site infections). The authors attempt to understand that the protective potential of operating room (OR) ventilation under different conditions is crucial to optimizing the surgical environment.

Methods

The setting was a Swedish university hospital with a high volume of surgical procedures (about 9,000 annually). The study data was collected in three parallel ORs of equal size, each equipped with an upward air-displacement system supplying cool air (2-3 degrees Celsius below room temperature) above the floor in each corner of the room. Data collection consisting of active air sampling and observations was performed during 30 orthopedic procedures. Sampling and data collection were done using a pretested, structured observation form, during the daytime and in most of the cases once a week, over a seven-month period from April to November 2010.

Findings

Air sampling was performed during 30 orthopedic operations in a total of 120 air-sampling intervals. In 52 of the 91 air samples collected (57%), the CFU/m3 values exceeded the recommended level of <10 CFU/m3. In addition, the data showed a



The Center for Health Design: Moving Healthcare Forward

The Center for Health Design advances best practices and empowers healthcare leaders with quality research providing the value of design in improving patient and performance outcomes in healthcare facility planning, design, and construction, optimizing the healthcare experience and contributing to superior patient, staff, and performance outcomes.

Learn more at www.healthdesign.org

strongly positive correlation between the total CFU/m3 per operation and total traffic flow per operation after controlling for duration of surgery. A weaker, yet still positive correlation was also found between CFU/m3 and the number of persons present in the OR. Traffic flow, number of persons present, and duration of surgery explained 68% of the variance in total CFU/m3.

Limitations

Some of the limitations of this study were:

- The data was collected by observation method, which has the potential to introduce observer bias. Observer accuracy in noting the observations is also crucial.
- The potential of bias can be introduced on the observed, thus altering their behavior, which might skew the study findings. The effects of the observer on the observed have not been accounted for, in this study.

Design Implications

This study found that traffic flow has a strong negative impact on the OR environment. Some strategies that could address these issues can be to direct the focus of change at an organizational level, including enhanced knowledge, logistics, and perioperative planning, that would give the OR staff the necessary tools to minimize door openings and reduce traffic in the OR. This would not only minimize traffic flow, but would also likely reduce the duration of wound exposure. The results of this study support interventions aimed at preventing surgical site infections by reducing traffic flow in the OR.