

## **Pre-incision vs. post-incision frequent door openings during total joint arthroplasty**

### **Abstract**

#### **Objective**

Frequent door openings in the OR are believed to disrupt laminar airflow and increase airborne contamination, leading to increased rates of surgical site infections. The objective of this study was to understand the reasons for door openings in the pre-incision and post-incision period of total hip and knee arthroplasty procedures and to determine if these periods are significantly different from one another.

#### **Design**

This is a cross-sectional, observational study.

#### **Setting**

Three large academic hospitals.

#### **Participants**

Total hip and total knee arthroplasty procedures were included in this study. 25 pre-incision sessions and 26 post-incision sessions were included in analysis.

#### **Methods**

The pre-incision period was defined as the time between the opening of the sterile instrument tray to the first incision. The post-incision period was defined as the time between the first incision and the application of the bandage.

#### **Results**

There were 0.56 (IQR 0.40-0.70) door openings/minute in the pre-incision period and 0.34 (IQR 0.26-0.45) door openings/minute in the post-incision period. This study found

a significant difference between these two periods, with  $p=0.0036$ . The most common reasons for pre-incision door openings were (25%) due to nurses obtaining supplies and (20%) due to the surgical team. The most common reasons for post-incision door openings were (18%) due to nurses obtaining supplies, (18%) due to the vendor.

### **Conclusions**

This study found a significant difference in door openings between the pre- and post-incision periods, which signifies that their roles are distinct, and they should be investigated separately. Given the previously reported significant increase in airborne contamination during the pre-incision period and the high rate of pre-incision door openings, it is reasonable to hypothesize that door openings may affect the sterility of the instrument tray. Further research is needed to understand the effect of door openings during these two periods as well as to discover an effective and sustainable intervention.