

### QUESTION 3: Does changing the electrocautery tip during surgery reduce the rate of subsequent surgical site infections/periprosthetic joint infections (SSIs/PJIs)?

**RECOMMENDATION:** While it is clear that electrocautery tips may become contaminated during surgery, no study has been able to prove a relationship between the amount of time that an electrocautery tip is exposed and its contamination. However, in cases where there is known infection, such as a one-stage or two-stage exchange arthroplasty for PJI, we do recommend changing the electrocautery tip at the end of the “dirty” portion of the procedure and prior to reimplantation of components.

**LEVEL OF EVIDENCE:** Limited

**DELEGATE VOTE:** Agree: 92%, Disagree: 5%, Abstain: 3% (Super Majority, Strong Consensus)

#### RATIONALE

Aseptic techniques are fundamental to the prevention of SSIs and PJIs. It is well-known that sterile surgical equipment can be contaminated intraoperatively, including gloves, gowns, light handles and even instruments that are introduced directly into the wound, such as suction catheter tips [1–6]. Certain recommendations have even been put forth regarding surgical equipment that have the potential to contaminate the surgical site, such as suction tips [7].

Electrocautery is frequently utilized during orthopaedic procedures for soft tissue dissection and obtaining hemostasis. Contamination of electrocautery tips was first noted in the dermatology literature. *Staphylococcus aureus* was shown to transfer from tissue to sterile tips and vice versa [8]. Shahi et al. performed the first study, examining the contamination of electrocautery tips in orthopaedic surgeries [9]. Electrocautery tips were collected from 25 primary total hip arthroplasties (THAs) and 25 aseptic revision THAs and were inoculated in cultures. Five unused electrocautery tips were also inoculated into cultures as negative controls. Cultures isolated an organism in 4% of electrocautery tips from primary THAs and 8% of tips from aseptic revision THAs. No organisms were isolated from the unused and clean tips. Thus, the rate of positive cultures was twice as high in the revision THA group [9].

While revision THA is known to take longer than primary THA, there was no association between electrocautery tip exposure time and contamination rate in the latter study. Conversely, a similar study conducted by Abdelaziz et al. looking at both primary and revision hip and knee arthroplasties, revealed a higher rate of electrocautery tip contamination in their primary arthroplasty cohort [10]. In this study, the authors reported a 10% rate of electrocautery tip contamination for the primary arthroplasty group and 4% for the aseptic revision cohort. All negative controls in this study also failed to isolate an organism on culture. This study also failed to show an association between duration of exposure of the electrocautery tip and subsequent contamination [10]. Furthermore, they noted a high rate of contamination (15/50, 30%) of the electrocautery tips in septic revisions.

In conclusion, electrocautery tips are vulnerable to contamination during surgery. However, the importance of such contamination is questionable. Larger, adequately-powered studies with sufficient follow-up to determine if this contamination is a source of subsequent SSIs/PJIs are needed but may be difficult to perform due to the large sample sizes needed for adequately powered SSIs/PJIs samples. Given the high rates of contamination noted during septic cases, changing the electrocautery tips prior to implantation of components is recommended.

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