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## Original Article

## The Use of Routine Postoperative Microscopy and Culture Screening Following Elective Hip and Knee Arthroplasty: An Unnecessary Cost With No Effect on Clinical Management?

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## ABSTRACT

**Background:** The use of microscopy and culture screening to detect pathogenic microorganisms followed by a decolonization protocol is a widely performed practice prior to elective hip and knee arthroplasty. In our center, the routine care of hip and knee arthroplasty also involves postoperative screening including direct culture of the surgical site. The aim of this study was to assess the frequency of pathogen detection following these tests and to determine whether routine postoperative screening, with particular reference to postoperative surgical site culture, led to any change in clinical management of these patients.

**Methods:** A series of 1000 patients undergoing hip or knee arthroplasty at The Mater Hospital between January 2014 and December 2015 were identified from our arthroplasty database. Results of preoperative and postoperative microscopy and culture screening were reviewed by 2 independent researchers.

**Results:** Of the 1000 subjects, positive microscopy and culture results were identified in 88 patients (8.8%) preoperatively and 5 patients (0.5%) postoperatively. None of the 1000 postoperative surgical site swabs had a positive microscopy and culture screen. All the 5 positive postoperative microscopy and culture screen results were in patients who had positive cultures preoperatively. There were no positive postoperative microscopy and culture screen results in patients who had had negative preoperative results. Postoperative screening was performed at a cost of AUS\$213 per patient.

**Conclusion:** Routine postoperative surgical site culture following hip and knee arthroplasty does not alter clinical management, has a significant associated financial cost, and has the potential to expose the patient to a risk of surgical site infection and is therefore not supported.

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Prevention of periprosthetic joint infection is a paramount consideration after joint arthroplasty. The association between *Staphylococcus aureus* carriage, particularly nasally, and the rate of surgical site infection (SSI) has been extensively investigated in orthopedic surgery and a higher rate of infection in *S aureus* carriers

as compared to noncarriers has been demonstrated [1–4]. A recent study has reported positive preoperative *S aureus* colonization in 22% of an arthroplasty population [4].

The use of microscopy and culture screening to detect pathogenic microorganisms, such as *S aureus* and methicillin-resistant *Staphylococcus aureus* (MRSA), preoperatively is widely performed prior to elective hip and knee arthroplasty in order that patients can be decolonized, reducing their risk of a postoperative infection [5,6].

Current practice at our unit involves the routine use of both preoperative and postoperative microscopy and culture screening, including postoperative surgical site culture, in patients undergoing elective hip and knee arthroplasty procedures. The routine use of postoperative microscopy and culture screening has been developed given the requirement of many inpatient rehabilitation units, to have these results available (including postoperative surgical site swabs)

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before allowing transfer to their unit. In order for postoperative wounds to be cultured, the sterile surgical site has to be exposed leading to the potential for introducing an infection. Whether the practice of postoperative surgical site microscopy and culture screening is warranted and alters clinical treatment is not known.

The aim of this study was to assess the frequency of a change in pathogen detection between the preoperative and postoperative microscopy and culture samples in a large consecutive series of subjects undergoing elective joint arthroplasty.

## Materials and Methods

A series of 1000 consecutive subjects undergoing hip and knee arthroplasty (primary or revision procedures) by the primary investigating surgeons (M.L., M.O.S., L.P., and J.R.) with complete preoperative and postoperative microscopy and culture samples at our institution between January 2014 and December 2015 were identified from our prospective arthroplasty database.

Routine treatment at our institution involved preoperative microscopy and culture samples taken several weeks prior to their operative procedure from 3 different sites, including the nose, groin, and any open wounds where present. Patients with positive microscopy and culture samples for MRSA or *S aureus* preoperatively were treated with outpatient “decolonization” treatment.

Decolonization treatment involves instruction to apply a 2% mupirocin nasal ointment (Bactroban; GlaxoSmithKline, Middlesex, UK) 3 times per day to both nares for 5 days and to bathe with 1% triclosan soap (Microshield; Schülke, Hamburg, Germany) daily for 5 days. Subjects with a positive MRSA sample were referred to an infectious disease specialist and were isolated with “contact precautions” during their inpatient stay.

Postoperative swabs were taken from 3 sites, most commonly from the surgical site, nose, and groin. In the majority of cases these were performed on postoperative day 1 though for those patients who had a drain *in situ* these would be performed on day 2 at the same time as drain removal. Surgical site culture involved removal or loosening of the dressing and direct swabbing of the surgical wound.

The pathology results of microscopy and culture samples were reviewed and any positive results were identified by 2 independent researchers (K.M. and C.C.).

## Results

One thousand subjects with complete preoperative and postoperative microscopy and culture samples were identified from a prospective surgical database and formed the study population. The mean age of participants was 67 years. Subjects underwent primary total hip replacement in 483 cases, primary total knee

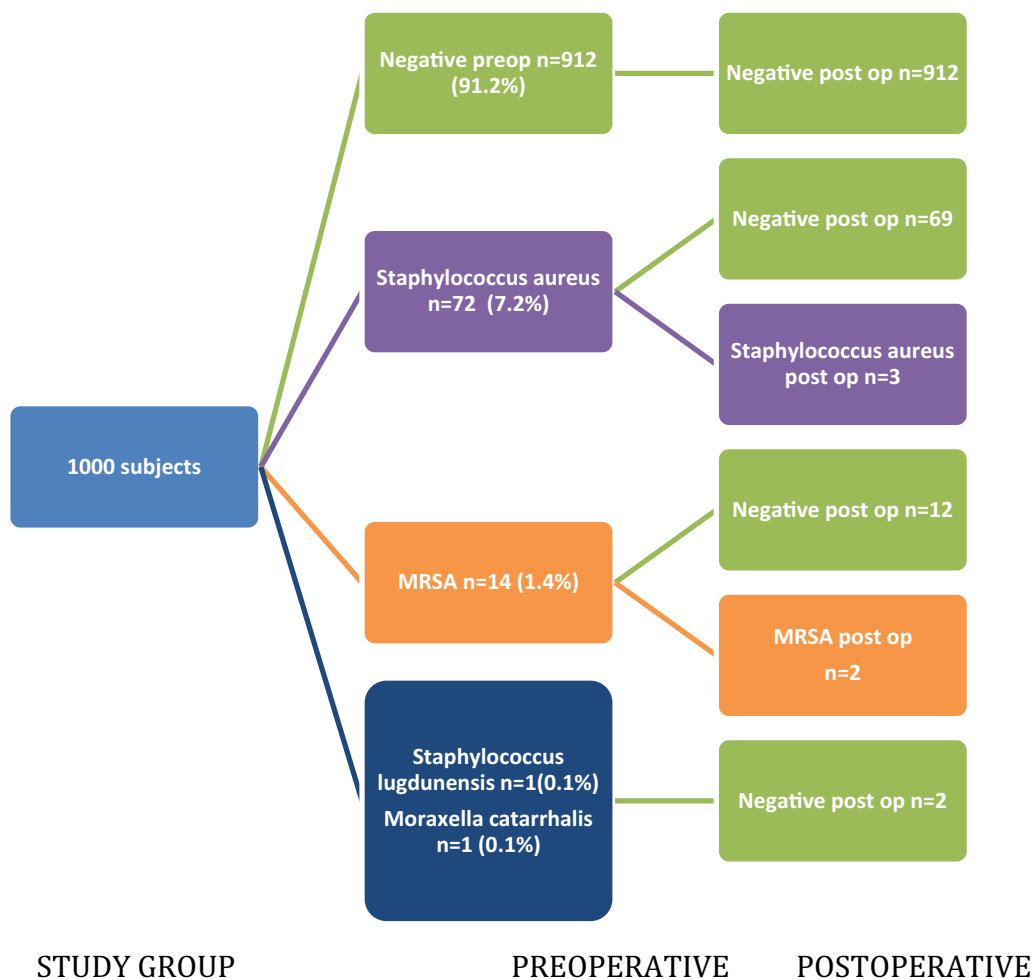


Fig. 1. Flow diagram demonstrating microscopy and culture sample results preoperatively and postoperatively.

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