

# *Staphylococcus aureus* and surgical site infections: benefits of screening and decolonisation before surgery

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## Publication

Journal of Hospital Infection, 2016

## At a glance

- *S. aureus* is the most common cause of SSI. Nasal colonisation with the pathogen is a particularly significant risk factor for patients.
- Universal decolonisation is not recommended for all patients, as resistance to the agent mupirocin emerges.
- The pre-operative identification of MRSA-carriers, followed by decolonisation before surgery, has the benefits of preventing SSI, helping to contain costs and minimising the emergence of resistance.

## Background

The impact of SSI includes significant morbidity and mortality, which lead directly to increasing healthcare costs. The incidence of SSI following major clean surgical procedures varies according to the procedure, with approximately 11% for cardiac surgery, 7% for vascular procedures, 2% for orthopaedic procedures and 5% for breast surgery.

*Staphylococcus aureus* is the most common cause of SSI, and nasal colonisation with *S. aureus* is the most important independent risk factor for the development of infection following clean surgery. As quoted in the publication, the rate of *S. aureus* SSI is two to nine times higher in carriers than in non-carriers. Various strategies to minimise SSI do exist: one approach is to decolonise patients who have been identified as carriers of *S. aureus* or MRSA, particularly before elective surgery. However, another approach recommends that all patients scheduled for surgery should be decolonised without pre-screening for *S. aureus*.

## Significance for work in a patient-oriented environment

*Staphylococcus aureus* is a common bacterial pathogen that causes significant morbidity and mortality in the community and in hospitals. This is why the WHO and national healthcare organisations such as the German Robert Koch Institute recommend nasal decolonisation in patients carrying *S. aureus* in the pre-operative phase. Mupirocin nasal ointment is named as an effective, safe and relatively low-cost treatment. But in recent years, increasing mupirocin resistance amongst *S. aureus* isolates, particularly MRSA, has been observed in China, France, Germany, India, Ireland, UK, USA.

## Method

The researchers conducted a review of the literature re-

garding recent changes in the epidemiology of *S. aureus*, especially MRSA, and the consequences of screening and decolonisation of patients who were tested positive for *S. aureus*. Relevant studies published in PubMed from 2000 to February 2016 were reviewed, as well as key studies published before this time. Focus of this review was sourcing and reviewing original papers describing controlled clinical trials or quasi-experimental studies involving interventions to prevent SSI caused by *S. aureus*. In addition, the authors also checked the reference lists of papers to determine if there were other studies that should be included, but which were not detected in the original literature search.

## Results

SSI caused by *S. aureus* are significant in terms of patient outcome and costs for healthcare systems. The pre-operative identification of carriers of MSSA and MRSA, followed by decolonisation before surgery, is associated with reduced SSI rates and cost savings.

The authors also reviewed recent studies on patients confined to intensive care units. The studies support universal decolonisation, as it shows reductions in overall bloodstream infection rates and healthcare costs. For critically ill patients who may be colonised with multi-drug-resistant microbes, such a horizontal infection prevention strategy might be suitable. Still, it should be regarded with caution elsewhere because of the risk of the emergence of resistance to mupirocin and other topical agents in *S. aureus*. In conclusion, screening and selective decolonisation of patients who have tested positive for *S. aureus* have the benefits of preventing SSIs, helping to contain costs, monitoring changes in circulating isolates of MSSA and MRSA, and minimising the emergence of resistance.