

THE PATHCARE NEWS

PRE-OPERATIVE SCREENING AND THE PREVENTION OF PROSTHETIC JOINT INFECTION



Prosthetic joint infection (PJI) occurs in approximately 1% of all cases of total joint arthroplasty. To mitigate this complication, pre-operative management of patient risk factors are important to improve the outcome of surgery.

Pre-operative Urine screening – NOT RECOMMENDED:

The International Consensus on Periprosthetic Infection meeting supported by the Musculoskeletal Infection Society and the European Bone and Joint Infection Society (EBJIS) agreed in 2013 that routine urine screening is not warranted for patients undergoing elective arthroplasty.¹ Current evidence does not support the treatment of asymptomatic bacteriuria (ASB) prior to non-urologic surgery.

When should urine cultures be requested?

- In *asymptomatic* patients with no specific symptoms of urinary tract infection (UTI) routine urine screening is not recommended prior to elective joint arthroplasty.
- Urine culture should only be requested in patients with symptoms suggestive of UTI. Symptomatic UTI should be treated before surgery due to the risk of hematogenous seeding to the joint.

What are the negative consequences of routine urine screening?

Routine urine screening and culture of asymptomatic patients increases antibiotic prescriptions for ASB. This unnecessary exposure to antibiotics:

- Impacts the normal flora negatively with an increase in antibiotic resistant colonizing flora
- Increases the risk for *Clostridioides difficile* infection
- May cause adverse drug effects
- Increases costs due to laboratory tests, antibiotics prescribed and associated costs with adverse effects

Treatment of ASB may be harmful to the patient as illustrated by a study by Cai et al. showing that in a cohort of women with recurrent UTI, treatment of ASB was associated with a higher rate of symptomatic UTIs and a higher prevalence of antibiotic-resistant bacteria. It is suggested that ASB may have a protective role in preventing symptomatic infection.²

Is it safe to eliminate pre-operative urine cultures?

- The elimination of routine urine culture before orthopaedic surgery has been shown to reduce antibiotic utilization and did not affect surgical site infection (SSI) and catheter-associated urinary tract infection (CAUTI) rates.³
- A 2019 meta-analysis showed that pre-operative treatment of ASB did not lower the risk of PJI or post-operative UTI.⁴ The majority of cultured PJI bacteria were different from the isolates found in the urine of ASB cases. Pre-operative antibiotic treatment did not show any benefit and cannot be recommended.
- **Several institutions report that the cessation of routine urine screening prior to non-urologic procedures can be safely implemented and improve value of care.**^{3,5,6}

Pre-operative *Staphylococcus aureus* screening and decolonization -RECOMMENDED:

Why should patients be screened for *Staph aureus* prior to elective orthopaedic surgery?

S. aureus colonization is an important risk factor for PJI and rates of SSIs are reported to be nine times higher in carriers compared to non-carriers.⁷ Malcolm et al. reported that the implementation of a screening and decolonization protocol can significantly decrease revision arthroplasty due to PJI. Universal decolonization pre-operatively without screening for *S. aureus* may contribute to mupirocin resistance and cannot be advocated.

How is *S. aureus* screening done?

S. aureus carriage cannot be predicted based on patient characteristics and necessitates individual testing. Bacterial culture or PCR methods can be used to screen for colonization. However, only culture-based methods can be used to determine mupirocin susceptibility. The nose is the most common site colonized by *S. aureus*, but screening multiple sites can increase the sensitivity of detection. A combination of three swabs from different sites provide the highest detection rate with the best combination being that of nasal/throat/groin or perineum or rectum.⁸

We process all swabs submitted for *Staph aureus* screening together to reduce costs and due to the fact that the decolonization protocol will not differ depending on the site colonized. Indicate on the request form the correct screening test:

- MRSA/MSSA culture (swab nose, throat + perineum) – test mnemonic: MISA [1 lab no. for all swabs]
Turnaround time (TAT): 2-4 days
- MRSA/MSSA PCR (swab nose, throat + perineum) – test mnemonic K2413 [1 lab no. for all swabs]
TAT: 24hrs after reaching the molecular lab. The PCR test is more costly.

The laboratory will report if MSSA or MRSA detected. The culture method will indicate if the isolate tested susceptible or resistant to mupirocin.

If a nose swab MC&S is requested, a different laboratory protocol will be applied and each swab will be processed and billed separately.

Decolonization protocol:

A systematic review of *S. aureus* screening and decolonization prior to orthopedic surgery, showed that in the majority of studies a decolonization protocol was instituted 5 days prior to surgery. These protocols mostly involved a combination of 2% mupirocin nasal ointment and daily chlorhexidine body washes. All the studies included in this review showed a reduction in SSIs.⁹ In cases of mupirocin resistance, neomycin-chlorhexidine (Naseptin®) nasal cream may be used as an alternative agent.

Compiled by Dr Heidi Orth, Clinical Microbiologist at PathCare, January 2024

References:

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