Orthopaedica Belgica 2019

Update on prevention of orthopaedic infection

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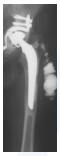
Does SSI matter ?

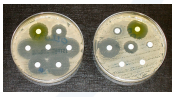
USA – 2006 – 80.000.000 surgical procedures



SSI ~ 1.9% (underestimated 50%)

Related costs 10.443 to 25.546 $

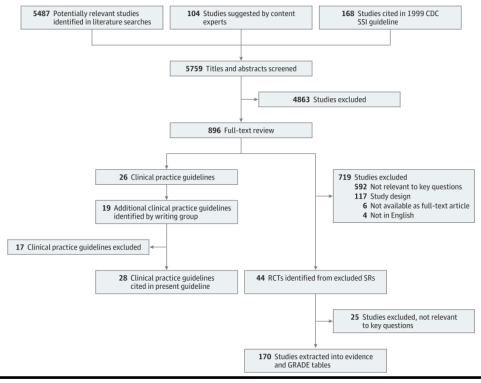
PJI or difficult to treat microrganism 90.000 $



Infection risk for THA/TKA is expected to increase from **2.18% to 6.5%** *(Kurtz et al 2007 and 2012)*

60% potentially preventable *(Umscheid et al. 2011)*

Center for Disease Control and SSI Prevention Guidelines Methodology



Recommendation Categories

IA: Strong – supported by high to moderate quality evidence – net clinical benefits

IB: Strong – supported by low quality evidence
or accepted practice supported by low to very low quality evidence

IC: Strong – required by State or regulation

II: Weak – any quality evidence - trade-off between clinical benefits and harms

No recommendation/unresolved issue – uncertain trade-offs ;
low to very low quality evidence

Parenteral Antimicrobial Prophylaxis

IB : Administer preoperative antibiotics **only when indicated and timed** such that the bactericidal concentration is established when the incision is made

IA: In clean procedures, **do not administer additional prophylactic antibiotic agent doses after surgical incision is closed**, even in the presence of a drain

No recommendation:
- Weight-adjusted parenteral antimicrobial prophylaxis
- Intraoperative redosing

Care in Belgium:
Program P4P: minimum 2 gr and max 6 g Cefazolin for primary THA/TKA – 90% rate

Non Parenteral Antimicrobial Prophylaxis

Category IB : Do not apply AB agents to the surgical incision

Category II (Weak):
- PRP is not necessary to prevent SSI
- use of triclosan-coated sutures

No recommendation:
- Intraoperative antimicrobial irrigation
- soaking prosthetic devices in AB solutions
- antimicrobial dressings

Glycemic control

IA : Perioperative glycemic control targetting less than 200 mg/dL

No recommendation:
- hemoglobin A1C target levels
- narrower blood glucose target levels

Normothermia and oxygenation

IA :
- Maintain **perioperative normothermia**
- Administer increased FiO_2 **during surgery and in the immediate postoperative period** for patients **undergoing general anesthesia with endotracheal intubation**

No recommendation:
- optimal target level of O2
- during surgery alone or postoperatively only
- strategies to achieve and maintain normothermia

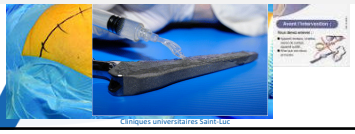
Antiseptic Prophylaxis

IA : perform intraoperative skin preparation with **an alcohol-based antiseptic agent**

IB: patient shower with soap or an antiseptic agent on at least the night before operative day

II:
- Application of microbial sealant is **not** necessary
- Plastic adhesive drape with or without antimicrobial properties is **not** necessary
-Intraoperative irrigation of deep contaminated tissues with aqueous iodophor solution is **not** necessary

No recommendation:
- soaking prosthetic devices in antiseptic solutions
- repeat application of antiseptic agent before closing surgical incision
- optimal timing of shower, number of antiseptic agent applications



Antiseptic Prophylaxis

Chlorhexidin Gluconate (CHG)

- increased amount of CHG on the skin leads to **enhanced activity, longer residual activity and activity in the presence of blood or serum**

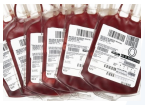
-Increasing use raises concern regarding **development of acquired bacterial resistance: Enterobacter, Pseudomonas, Proteus, Providencia and Enterococcus isolates** are **more often CHG resistant**.

- CHG potential agent for **cross-resistance to antibiotics**

-> reduce additional selection pressure in nosocomial pathogens

-> restrict CHG to those indications with a clear patient benefit

Blood Transfusion



IB : Do not withhold transfusion of necessary blood products

BUT

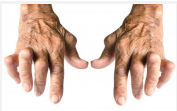
Blood transfusion is an independant risk factor for SSI in THA/TKA
(Caroll et al 2014 ; Frisch et al 2014)

- Patient preoperative optimisation *(erythropoïetin)*
- Patient peroperative management *(normothermia, controlled hypotension, tranexamic acid, standardisation surgical procedure)*
- Transfusion policy:

"In hemodynamically stable postoperative surgical patients, transfusion is recommended for hemoglobin levels of 8 g/dL or less for those with symptoms"

Systemic immunosuppressive therapy /Intraarticular corticosteroid injection

No recommendation



BUT

- treatment with anti-TNF agents be **withheld for 2–4 weeks prior** to major surgical procedures and **restarted postoperatively if there was no evidence of infection and wound healing was satisfactory**. *(British Society for Rheumatology Standards 2001)*

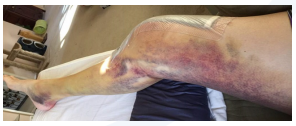
- biologic agents not be used **for at least 1 week prior to and 1 week following** surgery *(American College of Rheumatology 2008 recommendations)*

Anticoagulation

No recommendation

BUT

- infected patients and those with wound complications were more likely to have INR > 1.5 at the time of hospital discharge. Infected patients also had a significantly higher incidence of wound hematomas. (*Parvizi et al. 2007)*



Orthopaedic surgical space suit

No recommendation

BUT

- use of a space suit was associated with an increased number of deep SSIs requiring revision surgery within 6 months of THA or TKA. *(Hooper et al. 2011)*

- "limited spatial awareness and ease of contamination due to an apparent false sense of security" with the use of a space suit

Re-emphasis selected 1999 guidelines

PREPARATION OF THE PATIENT

- **identify and treat all infections** remote to the surgical site before elective operations
- **postpone elective operations** on patients with remote site infections until the infection has resolved

- **Do not remove hair preoperatively** unless the hair at or around the incision site will interfere with the operation
- If hair removal is necessary, remove **immediately before the operation, with clippers**
- Ensure skin around the incision site is **free of gross contamination** before performing antiseptic skin preparation

- Encourage **tobacco cessation for a minimum of at least 30 days** before elective operations

PREPARATION OF THE PATIENT: Staph Aureus carrier

> Educate the surgical staff to be aware that patients who carry SA in their nares/skin are more likely to develop SA surgical site infections.

> Recognize that decolonization efforts are not a "cure" per se, but a temporary reduction of SA from the nares and skin, the natural reservoirs where SA is most often carried.

> Establish pre-screening/decolonization program for designated elective surgeries (e.g., hip or knee replacement or coronary artery bypass surgery).

> Integrate CHG bathing and intranasal decolonization with mupirocin, povidone iodine nasal antiseptic, or alcohol-based nasal therapy into the decolonization protocol.

> Establish clear pre-admission testing protocols for the screening, detection and reporting of SA. Clearly state who performs the diagnostic swab, who processes the swab to determine if SA is present, who receives the notification of SA presence and who coordinates and implements follow-up treatment.

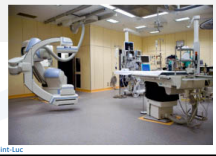
Re-emphasis selected 1999 guidelines

HAND/FOREARM ANTISEPSIS FOR SURGICAL TEAM

- Perform preoperative surgical hand/forearm antisepsis

OPERATING ROOM VENTILATION / CLEANING AND DISINFECTION OF ENVIRONMENTAL SURFACES

- Maintain positive pressure ventilation in the operating room and adjoining spaces.
- Maintain the number of air exchanges, airflow patterns, temperature, humidity, location of vents, and use of filters in accordance with recommendations
- Do not perform special cleaning or closing of operating rooms after contaminated operations



Re-emphasis selected 1999 guidelines

REPROCESSING OF SURGICAL INSTRUMENTS

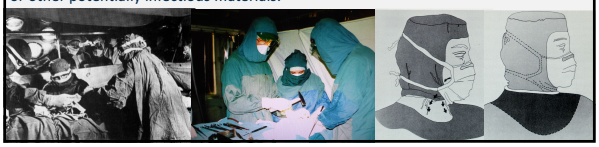
- Sterilize all surgical instruments according to published guidelines.

- Immediate-use steam sterilization **should never be used for reasons of convenience**, as an alternative to purchasing additional instrument sets, or to save time.
This practice should be **reserved only for patient care items that will be used immediately in emergency situations** when no other options are available.

Re-emphasis selected 1999 guidelines

SURGICAL ATTIRE AND DRAPES

- **Wear a surgical mask that fully covers the mouth and nose** when entering the operating room if an operation is about to begin or already under way, or if sterile instruments are exposed.
- **Wear a new**, disposable, or hospital laundered **head covering** for each case
- Ensure **it fully covers all hair on the head and all facial hair** not covered by the surgical mask
- **Wear sterile gloves** if serving as a member of the scrubbed surgical team.
- **Use surgical gowns and drapes** that are effective barriers when wet (i.e., materials **that resist liquid penetration**).
- **Change scrub suits that are visibly soiled**, contaminated, and/or penetrated by blood or other potentially infectious materials.



Re-emphasis selected 1999 guidelines

STERILE AND SURGICAL TECHNIQUE

- Adhere to principles of sterile technique when performing all invasive surgical procedures.
- If drainage is necessary, use a **closed suction drain**. Place a drain through a **separate incision** distant from the operative incision. **Remove the drain as soon as possible**.

POST-OP INCISION CARE

- Protect primarily closed incisions with a **sterile dressing for 24-48 hours**

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CONCLUSION

PREVENT SSI

ANTIMICROBIAL PROPHYLAXIS	USE CLINICAL PRACTICE GUIDELINES TO CHOOSE APPROPRIATE PROPHYLACTIC ANTIBIOTICS
PRE-OPERATIVE SKIN ANTISEPSIS	ENSURE PRE-OPERATIVE SKIN CLEANSING
PERI-OPERATIVE SKIN ANTISEPSIS	SELECT THE APPROPRIATE PERI-OPERATIVE SKIN ANTISEPTIC
PERI-OPERATIVE SAFETY CHECKLIST	UTILIZE A PERI-OPERATIVE CHECKLIST
NORMOTHERMIA	PREVENT HYPOTHERMIA DURING ALL SURGICAL PHASES
SUPPLEMENTAL OXYGEN	ESTABLISH PROTOCOL TO GUIDE USE OF SUPPLEMENTAL OXYGEN DURING AND AFTER SURGERY
GLUCOSE CONTROL	MONITOR FOR HYPERGLYCEMIA PRE-OPERATIVELY, INTRA-OPERATIVELY AND POST-OPERATIVELY
ADDITIONAL STRATEGIES TO PREVENT SSI	ADHERE TO ESTABLISHED GUIDELINES TO PREVENT SSI
	STAPHYLOCOCCUS AUREUS (SA) SCREENING AND DECOLONIZATION
	DEVELOP GUIDELINES FOR SURGICAL WOUND MANAGEMENT INTRA- AND POST-OPERATIVELY

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SAVE THE DATE

12-14 September 2019 · Antwerp · Belgium

Important deadlines
Abstract submission: 12 April 2019
Early registration: 1 July 2019

EBJIS 2019
38th Annual Meeting of the European Bone and Joint Infection Society

We look forward to seeing you in Antwerp!

www.ebjis19.org