Translating recommendations into practice for surgical site infection prevention

Claire Kilpatrick
IPC Global Unit
SDS, HIS, WHO HQ

XXVIIIᵉ Congrès National de la Société Française d’Hygiène Hospitalière 7 June 2017
WHO Infection Prevention and Control Global Unit

Protecting patient and health worker lives across the world through excellence in infection prevention and control

World Health Organization
Why IPC is so important for global health

- IPC occupies a unique position in the field of patient safety and quality of care, as it is universally relevant to every health worker and patient, at every health care interaction.
- Without effective IPC it is impossible to achieve *quality* health care delivery and strong health systems.

IPC contributes to achieving the following global health priorities:

**I.** Sustainable development goals (SDGs) 3.1-3, 3.8, 3.d and 6

**II.** AMR global and national action plans

**III.** Preparedness and response to outbreaks

**IV.** International Health Regulations

**V.** Post-Ebola recovery plans

**VI.** Quality universal health coverage

**VII.** Patient and health worker safety

**VIII.** WHO Global Strategy on integrated people-centred health services
Infection prevention and control

Surgical site infections

Surgical site infections (SSIs) occur following surgery, in the part of the body where the surgery took place, and are the most common type of health care-associated infection. The bacteria which cause SSIs can be resistant to commonly-used antibiotics and therefore threaten the lives of millions of patients every year. Ensuring that a range of preventive measures are in place will help stop the spread of germs, antibiotic resistance and reduce SSIs. The key measures include: appropriate skin disinfection before incision, ensuring that all surgical equipment is sterile, maintaining asepsis in the operating room, appropriate and timely antibiotic prophylaxis and the right surgical hand scrub.

Global WHO Guidelines for the Prevention of Surgical Site Infections

http://who.int/infection-prevention/en/
SSI burden worldwide

- About 80 000 hospitalised patients in Europe have at least one HAI on any given day

- In Europe, SSI are the second most frequent type of HAI (19.6%) – 543 149 (298 167-1 062 673) SSI episodes/year (HAI prevalence survey 2011)

- In the US, the overall SSI rate was 0.9% in 2014 (data from 3654 hospitals over 2 417 933 surgical procedures)

- SSI are the most frequent type of HAI on admission (67% in US, 33% in Europe)

- Surgical sepsis accounts for approximately 30% of all patients with sepsis

- SSI are the most frequent type of HAIs in LMICs and rates are significantly higher than in HICs (11%, on average)
Decontamination and Reprocessing of Medical Devices for Health Care Facilities

GLOBAL GUIDELINES FOR THE PREVENTION OF SURGICAL SITE INFECTION

Surgical site infections (SSI) are among the most preventable healthcare-associated infections and are a substantial burden to healthcare systems and service purchasers in terms of patient morbidity, mortality, and additional costs. SSI prevention guidelines are essential for the integration of evidence-based strategies. The World Health Organization (WHO) Headquarters in Geneva, Switzerland, and Region Europe: Western Pacific Regional Office (WPRO) in Bangkok, Thailand, developed the guidelines. The recommendations were based on the best available scientific evidence. The guidelines aim to provide useful information for healthcare exposures and their management in healthcare facilities.

3 November 2016
Patients with known nasal carriage of *S. aureus* should receive perioperative intranasal applications of mupirocin 2% ointment with or without a combination of CHG body wash.

MBP alone (without the administration of oral antibiotics) should NOT be used in adult patients undergoing elective colorectal surgery.

In patients undergoing any surgical procedure, hair should either NOT be removed or, if absolutely necessary, should only be removed with a clipper. Shaving is strongly discouraged at all times, whether preoperatively or in the operating room.

Surgical antibiotic prophylaxis (SAP) should be administered before the surgical incision, when indicated.
Nine strong recommendations – preoperative measures (2)

SAP should be administered within 120 min before incision, while considering the half-life of the antibiotic.

Surgical hand preparation should be performed either by scrubbing with a suitable antimicrobial soap and water or using a suitable alcohol-based handrub before donning sterile gloves.

Alcohol-based antiseptic solutions based on CHG for surgical site skin preparation should be used in patients undergoing surgical procedures.
Nine strong recommendations – intra & postoperative measures

Adult patients undergoing general anaesthesia with endotracheal intubation for surgical procedures should receive 80% fraction of inspired oxygen intraoperatively and, if feasible, in the immediate postoperative period for 2–6 h.

Surgical antibiotic prophylaxis administration should not be prolonged after completion of the operation.

But all guidelines need dissemination, adoption and implementation strategies.
Strategies to improve SSI prevention
A systematic review

- Focus - quality improvement initiatives designed to improve adherence with evidence based processes for SSI prevention
- Search - 1990-2015
- Pubmed, Embase, CINAHL, Cochrane library, WHO regional database, Afro-Lib and Africa-Wide
- English, French or Spanish

- 118 studies included
- Important - 84% used multi-faceted interventions
WHO Core Component 5 for effective IPC

Strong Recommendation: Multimodal Strategies

• **National level:** national IPC programmes should coordinate and facilitate the implementation of IPC activities through multimodal strategies on a nationwide or subnational level.

• **Facility level:** IPC activities using multimodal strategies should be implemented to improve practices and reduce HAI and AMR

- A **multimodal strategy** comprises **several elements or components** (3 or more; usually 5) implemented in an **integrated way** with the **aim of improving an outcome and changing behaviour**. It includes tools, such as bundles and checklists, developed by multidisciplinary teams that take into account local conditions.

- The 5 most common components: (i) **system change** (availability of the appropriate infrastructure and supplies to enable IPC recommendations implementation); (ii) **education and training** of health care workers and key players; (iii) **monitoring** infrastructures, practices, processes, outcomes and providing data **feedback**; (iv) **reminders** in the workplace/communications; and (v) **culture change** within the establishment or the strengthening of a safety climate.
Les cinq éléments de la Stratégie multimodale de l’OMS pour la Promotion de l’Hygiène des Mains

1a. Changement de système – Produit hydro-alcoolique sur le lieu de soins

1b. Changement de système – Accès à l’eau courante, propre en continu, au savon et aux essuie-mains

2. Formation et éducation

3. Evaluations et restitution des résultats

4. Rappels et incitatifs sur le lieu de travail

5. Culture institutionnelle de la sécurité
In other words...

1. Build it (system change)
2. Teach it (training & education)
3. Check it (monitoring & feedback)
4. Sell it (Reminders & communications)
5. Live it (culture change)

Mapping two implementation strategies

1. WHO HAND HYGIENE MULTIMODAL IMPROVEMENT STRATEGY & The 4 E's: An action-oriented implementation model (Pronovost et al) Kilpatrick et al. ICPIC 2017

The overall aim is to embed SSI evidence based recommendations as an integral part of the culture in the health care facility on the continuum of the surgical patient’s journey

1. WHO HAND HYGIENE MULTIMODAL IMPROVEMENT STRATEGY & The 4 E's: An action-oriented implementation model (Pronovost et al) Kilpatrick et al. ICPIC 2017
<table>
<thead>
<tr>
<th>TECHNICAL WORK</th>
<th>ADAPTIVE WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work that we know we should do, like appropriate antibiotic dosing and skin preparation</td>
<td>The intangible components of work, like ensuring team members speak up with concerns and hold each other accountable</td>
</tr>
<tr>
<td>Work that lends itself to standardization (e.g., <strong>checklists and protocols</strong>)</td>
<td>Work that shapes the <strong>attitudes, beliefs, and values</strong> of clinicians, so they consistently perform tasks the way they know they should</td>
</tr>
<tr>
<td>Evidence-based interventions</td>
<td>Safety culture, including teamwork</td>
</tr>
</tbody>
</table>
The Surgical Unit-based Safety Program (SUSP) approach – to be published soon

**Patient safety culture improvement (CUSP):**
- Science of safety education
- Staff safety assessment
  - Leadership
  - Learning from defects
- Team work & communications

**Infection prevention best practices** identified according to *local staff assessment*

**Improvement of the patient safety climate**

**Reduction of:**
- Surgical site infections
- Surgical complications
In other words...

1. Build it (system change)
2. Teach it (training & education)
3. Check it (monitoring & feedback)
4. Sell it (Reminders & communications)
5. Live it (culture change)

Creating a safe culture - engagement

- Surgical team: OR, ward, and outpatient services
- Infection prevention & control
- Anaesthetists
- Sterilization services
- Pharmacists
- Senior managers
- Trainers
### Peri-operative form

**Type of surgery:**

**Surgical Procedure:**

**Date of surgery:**

**Process Measures - Enhanced Data Collection Operations Only**

<table>
<thead>
<tr>
<th>Pre-op</th>
<th>Antiseptic soap use</th>
<th>Hair removal</th>
<th>Patient skin scrub</th>
<th>Chlorhexidine</th>
<th>Allowed to dry falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
</tbody>
</table>

**Complication of operation:**

- Emergency: must be done immediately to save life
- Urgent: must be done within 24 hours
- Semi-urgent: must be done within days-weeks
- Elective: no time constraints

**ASA class:**

1. Normal healthy person
2. Mild systemic disease (e.g., hypertension, well-controlled diabetes)
3. Severe systemic disease, not incapacitating (e.g., moderate COPD, diabetically maturity)
4. Incapacitating systemic disease that is a constant threat to life (e.g., pre-existing, very advanced HIV, heavy bleeding)
5. Moribund patient, not expected to survive 24hrs with or without operation (e.g., major trauma)

**Surgical wound class:**

- Clean: sterile tissue with no resident bacteria (e.g., Neurosurgery)
- Clean-contaminated: controlled entry into tissue with resident bacteria (e.g., hysterectomy)
- Contaminated: uncontrolled entry into tissue with bacteria (e.g., acute g-p perforation)
- Dirty/infected: severe contamination (e.g., in wounds or infection already established)

**Implanted material:**

- Drains used: Y/N
- Implant used: Y/N, metal (Y/N), plastic (Y/N), silicon (Y/N)

**Antibiotic prophylaxis:**

- None required
- Other (specify)

**Microbiology results:**

- Sensitivity test

**Date form completed:**

- Computer input [ ]

**Signature:**

---

### Post-operative form

**Day**

**Date**

**Events (Box 1)**

**Notes:**

**Box 1: Relevant post-operative should include**

- All patient reviews (IP/OP/telephone)
- Discharge from hospital
- Prescription of antibiotics
- Readmission to hospital
- Return to theatre
- Reported attendance/treatment elsewhere
- Patient death (describe cause)

**Box 2: Important symptoms for SSI**

- Pain at site (tender) / bloody / other
- Pain / tenderness beyond normal for operation
- Swelling / redness / heat of skin
- Wound breakdown
- Generally unwell, esp fever >38°C

**Box 3: Wound complications**

- Surgical Site Infections
- Infection criteria:
  - Operative site infection
  - Generalized infection
  - Deep site infection
  - Organ/space infection

- Other (specify)

**Microbiology results:**

- Sensitivity test

**Date form completed:**

- Computer input [ ]

**Signature:**

---
Surgical Handrubbing Technique

- Handwash with soap and water on arrival to OR, after having donned theatre clothing (cap/hat/bonnet and mask).
- Use an alcohol-based handrub (ABHR) product for surgical hand preparation, by carefully following the technique illustrated in Images 1 to 17, before every surgical procedure.
- If any residual talc or biological fluids are present when gloves are removed following the operation, handwash with soap and water.

Images 3-7: Smear the handrub on the right forearm up to the elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds).

1. Put approximately 5ml (5 doses) of ABHR in the palm of your left hand, using the elbow of your other arm to operate the dispenser.
2. Dip the fingertips of your right hand in the handrub to decontaminate under the nails (5 seconds).
My 5 Moments for Hand Hygiene
Focus on caring for a patient with a post-operative wound

1. Before touching a patient
2. Before cleaning a patient’s wound
3. After body fluid exposure
4. After touching a patient
5. After touching patient surroundings

Key additional considerations for post-operative wounds:
- Avoid unnecessary touching of the post-operative wound site, including by the patient.
- Wear gloves if contact with body fluids is anticipated. The need for hand hygiene does not change even if gloves are worn, as per the WHO 5 Moments.
- Follow local procedures regarding use of aseptic non-touch technique for any required dressing changes.
- Don’t touch dressing for at least 48 hours after surgery, unless leakage or other complications occur.
- Routinely post-operative wound dressings should be basic dressing types (e.g., absorbent or adhesive dressing).
- When approaching a patient for the examination of a wound, the health worker may also perform other tasks (e.g., accessing a venous catheter, drawing blood samples, checking urinary catheter). Hand hygiene may be needed before and after these specific tasks, to once again fulfill Moments 2 and 3, for example, refer to WHO dedicated 5 Moments posters for inpatient or catheter management.
- When indicated, pre-operative surgical antibiotic prophylaxis (SAP) should be administered as a single intravenous dose 30 minutes or less before the surgical incision, while considering the half-life of the antibiotic. Do not prolong administration of SAP after completion of the operation.
- Antibiotic therapy for any proven surgical site infection should ideally be administered based on wound sample culture and sensitivity results.
- Common signs and symptoms of wound infection are pain, induration, localized swelling, erythema, heat, or purulent drainage from the surgical incision.
- This guidance does not include information on complicated post-operative wound care, when specific treatments or therapies may be required.

SAVE LIVES
CLEAN YOUR HANDS

World Health Organization

Les 5 moments importants pour l’hygiène des mains
lors des soins aux patients présentant une plaie postopératoire

1. Immédiatement avant de toucher le pansement/le site de la plaie postopératoire
2. Avant d’examiner le site de la plaie, y compris avant de faire des prélèvements sur la plaie pour des investigations microbiologiques, s’il le faut
3. Avant de toucher la plaie pour enlever les points agrafés
4. Avant de préparer la matière pour changer le pansement
5. Après avoir touché l’environnement du patient

Autres considérations clés pour les plaies postopératoires
- Éviter de toucher le site de la plaie postopératoire si ce n’est pas nécessaire ; le patient doit également éviter de toucher la plaie.
- Porter des gants en prévision d’un contact avec des liquides biologiques : la nécessité de pratiquer les 5 Moments de l’hygiène des mains ne change pas même si le port des gants.
- Suivre les procédures relatives à l’utilisation d’une technique d’examen sans contact lors des changements de pansement et des interventions sur la plaie.
- Ne pas toucher le pansement au moins 48 heures après l’intervention, sauf en cas de fuite ou de complications.
- Les pansements à utiliser pour les plaies postopératoires doivent toujours être de type laxique (par exemple, pansements absorbants ou à fuite adhérente).
- Lors de la nettoyage d’un patient ayant une plaie, l’agent de santé peut aussi réaliser d’autres gestes, comme l’entretien du matériel ou la gestion du matériel, qui peuvent être nécessaires avant ou après ces gestes, pour les moments 2 et 3.

SAVE LIVES
CLEAN YOUR HANDS

Organisation mondiale de la Santé

World Health Organization
Known barriers

- Organisational ‘constipators’
- Significant workload
- Building the trust of staff in the institution
- Staff turnover
- Absence of patient safety culture
- Theatre discipline difficult to change
- Dedicated resources (surv)
- Data collection and local interpretation to allow for feedback
- Availability and quality control of locally produced products
- Producing local SAP policies according to drug availabilities – by far most challenging measure to implement (SUSP Africa project)
Coming next from WHO

- Understanding the multimodal strategy for successful SSI prevention

- A new WHO document featuring learning and recommendations from:
  - Surgical Unit-based Safety Program work
  - Evidence based strategies to improve SSI prevention
  - Implementing the WHO surgical checklist and the ‘CleanCut’ project

- Advanced IPC training modules inc SSI
WHO guidelines & implementation

GLOBAL GUIDELINES FOR THE PREVENTION OF SURGICAL SITE INFECTION

Decontamination and Reprocessing of Medical Devices for Health Care Facilities

Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level

WHO Guidelines on Hand Hygiene in Health Care

First Global Patient Safety Challenge Clean Care is Safer Care

MAKING SMART INJECTION CHOICES:
YOUR GUIDE TO SAFE MEDICAL TREATMENT

SAVE LIVES
Clean Your Hands

Guide to Implementation
A Guide to the Implementation of the WHO Multimodal Hand Hygiene Improvement Strategy

Interim Practical Manual supporting national implementation of the WHO Guidelines on Core Components of Infection Prevention and Control Programmes
Merci

WHO Infection Prevention and Control
Global Unit

Learn more at: http://who.int/infection-prevention/en/