



**World Health  
Organization**



**GLOBAL GUIDELINES FOR THE  
PREVENTION OF SURGICAL SITE  
INFECTION:  
An introduction**

**Launched 3 November 2016**

# Why surgical site infection prevention?

It is estimated that hundreds of millions of patients are affected by health care-associated infections (HAI) worldwide, each year. At present, no country is free from the burden of disease caused by HAI.

Surgical site infections (SSI) are potential complications associated with any type of procedure and are among the most preventable HAI.

SSI is the most frequent type of HAI in low- and middle-income countries (affecting on average 11% of patients who undergo a surgical procedure) and the second or third most frequent type of HAI in the United States and Europe.

*Allegranzi B et al.*  
*Lancet 2011;377:228-41*

Articles

World Health Organization Patient Safety  
A WHO Alliance for Safer Health Care

Burden of endemic health-care-associated infection in developing countries: systematic review

Published on 5 May 2011  
<http://www.who.int/gpsc/en/>

Report on the Burden of Endemic Health Care-Associated Infection Worldwide

Clean Care is Safer Care

Introduction  
Health-care-associated infections are deemed the most frequent adverse events (distressing patients' safety worldwide).<sup>1</sup> However, reliable estimates of the global burden are hampered by a paucity of data adequately describing endemic infections at national and regional levels, particularly in resource-limited settings.<sup>2</sup> In countries where less than 5% of the gross national product is spent on health care, and where the density is less than five per 1000 population,<sup>3</sup> other emerging health problems and diseases take priority.<sup>4</sup> The epidemiological gap leading to the absence of reliable estimates of the global burden is mainly because surveillance of health-care-associated infection depends on time and resources and needs expertise in study design, data collection, analysis, and interpretation. Very few countries of low and middle income have national surveillance systems for health-care-associated infections. Data from the International Nosocomial Infection Control Consortium,<sup>5</sup> and findings of two systematic reviews on hospital-acquired bacterial infections<sup>6</sup> and ventilator-associated pneumonia,<sup>7</sup> suggested not only that risks of health-care-associated infection are significantly higher in developing countries

but also that systems to solve the aim of infection in its surveillance resources-limited for improve health problems and diseases take priority.<sup>4</sup> The epidemiological gap leading to the absence of reliable estimates of the global burden is mainly because surveillance of health-care-associated infection depends on time and resources and needs expertise in study design, data collection, analysis, and interpretation. Very few countries of low and middle income have national surveillance systems for health-care-associated infections. Data from the International Nosocomial Infection Control Consortium,<sup>5</sup> and findings of two systematic reviews on hospital-acquired bacterial infections<sup>6</sup> and ventilator-associated pneumonia,<sup>7</sup> suggested not only that risks of health-care-associated infection are significantly higher in developing countries

Methods  
We searched electronic databases and reference lists of relevant studies containing full or partial data from developing countries including overall health-care-associated infection and major cause—were selected. We classified studies as low-quality or high-quality were pooled for analysis.

Findings  
Of 271 selected articles, 220 were included in the final analysis. Studies containing full or partial data from developing countries reported in high-quality studies were greater than those from low-quality on infection (pooled prevalence in high-quality studies, 15.5 per 100 patients); proportions reported from Europe and the USA. Pooled overall health-care-associated infection was 47.9 per 1000 patient-days (95% CI 36.7–59.1), reported from the USA. Surgical-site infection was the leading infection (5.4 per 100 surgical procedures), suitably higher than proportions reported for health-care-associated infections (in eight studies), very few articles reported a

Interpretation  
The burden of health-care-associated infection in developing need to improve surveillance and infection-control practices.

Funding  
World Health Organization.

www.thelancet.com Published online December 11, 2010 DOI:10.1016/S0140-6736(10)61458-4

# 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 septic patients
- ❑ SSI are the most frequent type of HAIs in LMICs and rates are significantly higher than in HICs (11%, on average)



# Main reasons for developing surgical site infection prevention guidelines

- ❑ High global epidemiological burden
- ❑ Highly preventable infection
- ❑ No recent evidence-based guidelines
- ❑ Need for a global perspective
- ❑ Need for taking into account balance between benefits and harms, evidence quality level, cost and resource use implications, and patient values and preferences

# What are the global guidelines?

- ❑ The World Health Organization (WHO) *Global guidelines for the prevention of surgical site infection* provide a comprehensive range of evidence-based recommendations that take account of:
  - ✓ the global perspective
  - ✓ the balance between benefits and harms
  - ✓ the evidence quality level
  - ✓ cost and resource implications (including for LMICs), and
  - ✓ patient values and preferences.
- ❑ *Importantly, the implementation and dissemination of the guidelines are two crucial steps that now need to be undertaken by the international community, as well as by national and local health services.*

# Guideline development

- ❑ WHO guidelines are developed following a standard methodology described in the *WHO Handbook for Guideline Development* and in accordance with the WHO Guidelines Review Committee (GRC)
  
- ❑ **The process included:**
  - Identification of primary critical topics/outcomes and the development of related PICO (Population, Intervention, Comparator, Outcomes) questions
  - Retrieval of evidence through systematic reviews of each topic
    - Systematic reviews were conducted between December 2013 and October 2015 in order to provide supporting evidence for the development of each recommendation
  - Assessment and synthesis of the evidence
  - Formulation of recommendations with leading experts from around the world – 29 recommendations on 26 topics have been outlined, nine of which are “strong recommendations”
  - Writing of guidelines content and planning for dissemination and implementation

# Recommendations and much more

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# Nine strong recommendations – preoperative measures (1)

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



# What can you do now?

- Go to [www.who.int/gpsc/SSI-guidelines/en](http://www.who.int/gpsc/SSI-guidelines/en) and download the Guidelines and supporting materials – available now with more to be added through 2017
- Promote the two associated publications in the Lancet Infectious Diseases
- Advocate for adoption of the global guideline recommendations
- At the local level, continue to promote surgical site infection prevention, including implementation and change strategies.



# WHO Infection Prevention and Control

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



**Thank you!**