WHO approaches for IPC implementation, with special focus on low-resource settings
From guidelines to field testing to strategies for implementation

Professor Benedetta Allegranzi
IPC Global Unit, WHO HQ
### Disclosure of speaker’s interests

<table>
<thead>
<tr>
<th>(Potential) conflict of interest</th>
<th>None</th>
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<tr>
<td>Potentially relevant company relationships in connection with event</td>
<td>None</td>
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<tr>
<td>• Sponsorship or research funding</td>
<td>None</td>
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<td>• Fee or other (financial) payment</td>
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<td>• Shareholder</td>
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<td>• Other relationship, i.e. …</td>
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HEALTH WORKERS

Champion clean care
It’s in your hands

#InfectionPrevention
#HandHygiene #HealthForAll

INFECTION PREVENTION & CONTROL LEADERS

Monitor infection prevention and control standards
Take action and improve practices

#InfectionPrevention
#HandHygiene #HealthForAll
WHO approach for guidelines development & implementation

Evidence & consensus → Guidelines → Implementation strategies & tools → Testing & research → Dissemination → Measuring impact
WHO’s process for developing Guidelines

Systematic Review

Relative importance of outcomes

Evidence Profile (results and quality by outcome)

Overall quality of evidence

Benefit – risk evaluation

Values and preferences, resource implications, feasibility

Formulation and rating of strength of recommendation
WHOWHO Guidelines on Core Components of IPC Programmes at the National and Acute Health Care Facility Level

Focus on preventing HAIs and combating AMR

• http://www.who.int/infection-prevention/publications/ipc-components-guidelines/en/
• Zingg W et al. TLID 2015
• Storr J et al. ARIC 2017
• Price L et al. TLID 2017
Hospital organisation, management, and structure for prevention of health-care-associated infection: a systematic review and expert consensus

Walter Zingg, Alison Holmes, Markus Dettenkofer, Tim Goetting, Federica Secchi, Lauren Clack, Benedetta Allegranzi, Anna-Pelagia Magiorakos, Didier Pittet, for the systematic review and evidence-based guidance on organization of hospital infection control programmes (SIGHT) study group*

Despite control efforts, the burden of health-care-associated infections in Europe is high and leads to around 37,000 deaths each year. We did a systematic review to identify crucial elements for the organisation of effective infection-prevention programmes in hospitals and key components for implementation of monitoring. 92 studies published from 1996 to 2012 were assessed and ten key components identified: organisation of infection control at the hospital level; bed occupancy, staffing, workload, and employment of pool or agency nurses; availability of and ease of access to materials and equipment and optimum ergonomics; appropriate use of guidelines; education and training; auditing; surveillance and feedback; multimodal and multidisciplinary prevention programmes that include behavioural change; engagement of champions; and positive organisational culture. These components comprise manageable and widely applicable ways to reduce health-care-associated infections and improve patients' safety.
Facility level systematic reviews (1996-2015)

Number of records identified through database searching
N = 47,948

Additional records identified through other sources
N = 131

Total records identified: 48,079

Duplicates from different databases removed: 8362

Articles for title and abstract evaluation: 39,717

Removed after title and abstract evaluation: 37,487

Articles for full text evaluation: 2230

Articles excluded: 1397
- Selection criteria not met: 1040
- Full text inaccessible: 357

Articles for quality assessment: 833

Duplicates from different dimensions removed: 226

Removed due to insufficient quality: 515

Articles included for data analysis and synthesis: 92
[RCT (3), CBA (5), ITS (4), CCS (4), NCBA (34), NCC (22), Qualitative (16), Mixed-methods (4)]

39,343 records identified through database searching and after eliminating duplicates

No records identified through other sources

39,343 records screened for title and abstract

38,610 excluded

733 records eligible for full-text assessment

545 of full-text articles excluded:
- 535 did not met selection criteria
- 10 full-text articles were not available

188 articles met the inclusion criteria

- 148 articles did not meet the correct study type**
- 13 articles were qualitative studies

27 articles included in qualitative assessment (EPOC) according to correct study type**


Total: 87,422 hits → 119 selected
### Methods for quality assessment

- **SIGHT review: Integrated quality Criteria for Reviews Of Multiple Study designs** (ICROMS)

### NCBA CS

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<th>Quality criteria</th>
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<th>NCB</th>
<th>QUAL</th>
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### SIGHT update & national review: studies meeting Cochrane’s Effective Practice and Organization of Care (EPOC) criteria:

- Full economic evaluations or partial economic evaluations
- Randomized controlled trials (RCT)
- Cluster randomized trials (CRT)
- Non-randomized trials (NRT)
- Controlled before and after studies (CBA)
- Interrupted time series (ITS) studies
National level systematic review (2000-2015)

Records identified through database searching
(n = 8,937)

Additional records identified through other sources
(n = 128)

Records after duplicates removed
(n = 8,816)

Records screened
(n = 8,816)

Records excluded
(n = 8,491)

Full-text articles assessed for inclusion criteria
(n = 325)

Full-text articles excluded, with reasons
(n = 215)

Studies data meeting EPOC criteria for quality assessment
(n = 26)

Studies data not meeting EPOC criteria for quality assessment
(n = 84)

Introduction
Health-care-associated infection (HAI) is a major global health problem, affecting millions of patients worldwide every year. HAIs have serious implications for patients and health-care systems. Despite considerable efforts to reduce the incidence of HAIs, the problem persists. This systematic review describes the evidence on HAIs and the evidence on interventions to reduce them. The review covers data from high-income and lower-middle-income countries and includes data from both hospital and primary care settings. The review is based on the 2015 edition of the Cochrane Infectious Diseases Group (CIDG) handbook and the UK National Institute for Health Care Excellence's Handbook for Systematic Reviews of Interventions (EPOC) criteria.

Key points
- Surveillance with active feedback led to significant improvements in infection control.
- Some evidence supports the effectiveness of other interventions on communication and education.
- Studies showing the effectiveness of infection control interventions in reducing HAIs should be considered for inclusion in future research designs to improve study design and methodological constraints.
- The evidence from systematic reviews and the EPOC criteria for infection control interventions are critical in guiding future research designs.

Price L et al. Lancet Infect Dis, published online October 31, 2017
http://dx.doi.org/10.1016/S1473-3099(17)30479-6
WHO core components for effective IPC programmes

- **8 Core components**
  - 8 Facility level
  - 6 National level

- **11 evidence*-based recommendations**

- **3 good practice statements**

* Evidence from LMICs:
  - 7 high-quality studies
  - 22 lower quality

R= recommendation; GPS: good practice statement
WHO Guidelines, updated 2018

- 28 systematic reviews & meta-analyses
- 29 recommendations
- 30 core chapters

http://apps.who.int/iris/bitstream/10665/250680/1/9789241549882-eng.pdf?ua=1
IPC to prevent the spread of CRO

- 8 recommendations
- Key areas:
  - Multimodal strategy
  - Hand hygiene
  - Surveillance
  - Contact precautions
  - Patient isolation
  - Environmental cleaning
  - CRE-CRAB-CRPsA surveillance cultures of the environment
  - Monitoring, Audit and Feedback

http://www.who.int/infection-prevention/publications/focus-amr/en/
Flowchart: 17* studies included

- Total Abstracts screened: 9247
  - From electronic databases: 5048
  - From conferences: 4199

Abstracts potentially including:
- CRE: 9247
- CRAB-CRPsA: 1426

* 1 study included both CRE and CRAB and it’s counted twice
Change in results by re-analyzing the data

- Initially: 5 CRE, 3 CRAB, and 0 CRPsA EPOC studies = 8
  - Most studies dropped out because they only provided a crude difference in rates before and after and p-value
  - Even included studies were often missing complete data for change in level and slope
- Contacted authors for raw data to conduct necessary analyses to meet EPOC criteria
- Final review with re-analysed data: 11 CRE, 5 CRAB, and 3 CRPsA EPOC studies = 17
WHO approach for guidelines development & implementation

Evidence & consensus → Guidelines → Implementation strategies & tools
Translating guidelines to action
Main challenges to implement IPC in low- and middle-income countries

- HAIs and IPC not on the top of the national health agenda
- Gap between policy and actual implementation
- Lack of reliable data on HAIs (poor laboratory support and surveillance systems)
- Limited access to qualified and trained IPC professionals
- Limited human resources (understaffing)
- Inadequate budgets
- WASH and infrastructure gaps
- Supplies procurement challenges
- Need for adaptation or tailoring to the cultural setting and local context, and according to available resources

- Allegranzi B et al. The Lancet 2011;377:228-41
- National and facility manuals supporting the implementation resources of the WHO IPC Core Components Guidelines (http://www.who.int/infection-prevention/tools/core-components/en/)
- M. Licker et al. J Hosp Infect 2017; 85e88
However:

- Resources invested are worth the net gain, irrespective of the context and despite the costs incurred.
- Not all solutions require additional resources.
- Some solutions can likely be low cost and local production (e.g., alcohol-based hand rubs) should be encouraged.
- Partnerships or partners’ collaborations could assist in the achievement of the core components delivery and funding.
Implementation resources for the WHO
IPC Core Components Guidelines

http://www.who.int/infection-prevention/tools/core-components/en/
Recently launched WHO SSI Prevention Implementation Package

Fact sheets on SSI recommendations

http://www.who.int/infection-prevention/tools/surgical/en/
Implementation manuals

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

Implementation manual to support prevention of surgical site infections at the facility level
TURNING RECOMMENDATIONS INTO PRACTICE

PREVENTING SURGICAL SITE INFECTIONS: IMPLEMENTATION APPROACHES FOR EVIDENCE-BASED RECOMMENDATIONS

IMPROVING INFECTION PREVENTION AND CONTROL AT THE HEALTH FACILITY

Implementation manual to promote and control the spread of carbapenem-resistant organisms at the national and health care facility level

Interim practical manual supporting implementation of the Guidelines for the prevention and control of carbapenem-resistant Enterobacteriaceae, Acinetobacterbaumanni and Pseudomonas aeruginosa in health care facilities
5 KEY CONCEPTS

- Patient centeredness
- Leadership in IPC
- Multidisciplinary team
- Multimodal strategies
- Cycle
Technical Work

- Evidence-based interventions

Adaptive Work

- Safety culture
## Explaining technical and adaptive work

<table>
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<tr>
<th>TECHNICAL WORK</th>
<th>ADAPTIVE WORK</th>
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<td>Work that we know we should do: implementation of evidence-based recommendations (e.g. appropriate antibiotic dosing and skin preparation)</td>
<td>The intangible components of work, like ensuring that 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 that they consistently perform tasks the way they know they should</td>
</tr>
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<td>Evidence-based interventions</td>
<td>Safety culture, including improved communications and teamwork</td>
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Principles of safe design: CUSP integrates adaptive and technical work. Baltimore, ML: Johns Hopkins Medicine;2014
Core component 5: Multimodal strategies

Evidence (44 studies at facility, 14 at national level) shows that implementing IPC activities at facility level using multimodal strategies is effective to improve IPC practices and reduce HAI (particularly hand hygiene compliance, central line-associated bloodstream infections, ventilator-associated pneumonia, infections caused by MRSA and *C. difficile*).

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.
What is a multimodal strategy?

• **It is “THE” modern way to implement IPC interventions**
  
  ✓ to achieve the system change, climate and behaviour that support IPC progress and, ultimately, the measurable impact that benefits patients and health care workers

• **Multimodal thinking** means that IPC practitioners do not focus only on single strategies to change practices (for example, training and education), but consider a range of strategies that target different influencers of human behaviour, e.g. procurement, monitoring and feedback, infrastructures or organizational culture

• All (five) areas should be considered and necessary action taken, based on the local context and situation informed by periodic assessments

• Lessons from the field suggest that targeting only one of these five elements (using a “unimodal” strategy) is more likely to result in improvements that are short-lived and not sustainable
IPC improvement strategy: multimodal thinking

In other words, the WHO multimodal improvement strategy addresses these five areas:

1. Build it (system change)
   - What infrastructures, equipment, supplies and other resources (including human resources) are required to implement the intervention?
   - Does the physical environment influence health worker behaviour? How can ergonomic and human factors approaches facilitate adoption of the intervention?
   - Are certain types of health workers needed to implement the intervention?
   - Practical example: when implementing hand hygiene interventions, ease of access to hand-wash stations at the point of care and the availability of WASH infrastructures (including water and soap) are important considerations. Are these available, affordable and easily accessible in the workplace? If not, action is needed.

2. Teach it (training & education)
   - Who needs to be trained? What type of training should be used to ensure that the intervention will be implemented in line with evidence-based policies and how frequently?
   - Does the facility have training aids, including the necessary equipment?
   - Practical example: when implementing infection control interventions, training of those responsible for administering safe injections, including nurses and community health workers, is important considerations, as well as adequate disposal methods.

3. Check it (monitoring & feedback)
   - How can you identify the gaps in IPC practices or other indicators in your setting to allow you to prioritize your intervention?
   - How can you be sure that the intervention is being implemented correctly and safely, including at the bedside? For example, are there methods in place to observe or track practices?
   - How and when will feedback be given to the target audience and managers? How can patients also be informed?
   - Practical example: when implementing surgical site infection interventions, the use of key tools is important considerations, such as surveillance data collection forms and the WHO checklist (adapted to local conditions).

4. Sell it (reminders & communications)
   - How are you promoting an intervention to ensure that there are cues to action at the point of care and messages are reinforced to health workers and patients?
   - Do you have capacity/funding to develop promotional messages and materials?
   - Practical example: when implementing interventions to reduce catheter-associated bloodstream infection, the use of visual cues to action, promotional reinforcing messages, and planning for periodic campaigns are important considerations.

5. Live it (culture change)
   - Is there demonstrable support for the intervention at every level of the health system? For example, does senior management provide funding for equipment and other resources? Are they willing to be champions and role models for IPC improvement?
   - Are teams involved in co-developing and adopting the intervention? Are they empowered and do they feel ownership and the need for accountability?
   - Practical example: when implementing hand hygiene interventions, the way that a health facility approaches this as part of safety and quality improvements and the value placed on hand hygiene improvement as part of the clinical workflow are important considerations.

Figure 5.1 The five components of the WHO multimodal hand hygiene improvement strategy

1a. System change – alcohol-based handrub at point of care

1b. System change – access to safe, continuous water supply, soap and towels

2. Training and education

3. Evaluation and feedback

4. Reminders in the workplace

5. Institutional safety climate

Source: http://www.who.int/infection-prevention/tools/core-components/cc-implementation-guideline.pdf?ua=1
Multimodal thinking...

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   (system change)

What infrastructures, equipment, supplies and other resources (including human) are required to implement the intervention?

Does the physical environment influence health worker behaviour? How can ergonomics and human factors approaches facilitate adoption of the intervention?

Are certain types of health workers needed to implement the intervention?

**Practical example:** when implementing hand hygiene interventions, ease of access to handrubs at the point of care and the availability of WASH infrastructures (including water and soap) are important considerations. Are these available, affordable and easily accessible in the workplace? If not, action is needed.
Multimodal thinking...

2. Teach it
(training & education)

Who needs to be trained? What type of training should be used to ensure that the intervention will be implemented in line with evidence-based policies and how frequently?

Does the facility have trainers, training aids, and the necessary equipment?

Practical example: when implementing injection safety interventions, timely training of those responsible for administering safe injections, including carers and community workers, are important considerations, as well as adequate disposal methods.
Multimodal thinking...

3. Check it
(monitoring & feedback)

How can you identify the gaps in IPC practices or other indicators in your setting to allow you to prioritize your intervention?

How can you be sure that the intervention is being implemented correctly and safely, including at the bedside? For example, are there methods in place to observe or track practices?

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Operational manual for the WHO SSI prevention recommendations.

This implementation manual is designed to be used by all persons concerned by the prevention of SSI in all health care settings, irrespective of the country.

Launched in December 2018

http://www.who.int/infection-prevention/tools/surgical/en/
**Bringing improvement to life**

- **Example Scenario**
- **Problem**
- **Case study**

<table>
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<tr>
<th>What has to be addressed to make the improvement required?</th>
<th>Why?</th>
<th>When?</th>
<th>Who should be involved to make sure improvement happens?</th>
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<tr>
<td>ELEMENTS OF THE MULTIMODAL STRATEGY - THE &quot;HOW OF IMPROVEMENT&quot;</td>
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<tr>
<td>SYSTEM CHANGE ('built it')</td>
<td>• Include clear instructions about SAP discontinuation within the locally adopted SAP protocol.*</td>
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<td>• In collaboration with staff, develop/adapt reminders and agree upon their most relevant placement to highlight discontinuation of SAP. Develop in various formats targeted to individuals (or teams) who consistently prolong SAP.</td>
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<tr>
<td>TRAINING AND EDUCATION ('teach it')</td>
<td>• Put in place/improve a reliable mechanism for producing/using updated training resources and information for staff (surgical team, nursing staff and pharmacy) on appropriate SAP according to the local protocol, with an emphasis on the need for SAP discontinuation, including the available evidence.</td>
<td></td>
<td></td>
<td>• Engage leaders and champions among surgical and anaesthesiology staff to drive change on SAP discontinuation.</td>
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</table>
| MONITORING AND FEEDBACK ('check it') | • Put in place/improve a monitoring, reporting and feedback system (including roles and responsibilities) regarding:  
- staff knowledge and perception about prolonging SAP;  
- frequency and reasons for SAP prolongation;  
- SSI rates. | | | • Organize meetings and focus group discussions with all the right people to discuss the reasons for discontinuing SAP in the context of the local protocol. |
| COMMUNICATIONS AND REMINDERS ('sell it') | | | | • Engage senior management to issue messages on a regular basis to support SAP discontinuation that are also linked to reducing AMR in the facility. |

DO THE **RIGHT THING AT THE RIGHT TIME** TO STOP SURGICAL SITE INFECTION
Recommendations for safe surgical care

**Multidisciplinary team**

- **Preoperative**: Patient, clinical and support staff, and surgical team actions
- **Intraoperative**: Surgical team actions
- **Postoperative**: Surgical team, clinical staff actions

- **Surgical team and clinical staff**
- **Anaesthetist**
- **Infection prevention and control (IPC) team**
- **Procurement/sterilization unit**
- **Patient information and education**
Critical linkages with other programmes

- Waste management
- TB/HIV
- Surveillance
- Hep B/C
- AMR
- Community engagement
- Occupational health
- WASH
- Policies & guidelines
- Media
- Patient Safety / Quality
The importance of leadership in IPC

To achieve implementation, we need to influence doctors, nurses, managers and politicians and all disciplines in health care!
WHO IPC Leadership training modules

Session 1
Introduction to leadership in the context of:
The Core Components;
The multimodal strategy;
Implementation resources;
Project management;
IPC interlinkages;
Principles of adult learning.

Session 2
Drill-down on IPC leadership:
What makes a good leader?;
The relevance of leadership to IPC;
Leadership characteristics;
Types of leaders;
Leadership challenges and opportunities.

Session 3
Exploration of implementation and behaviour change:
Implementation success factors;
Behaviour change and implementation;
Quality improvement cycles and implementation;
Leadership challenges and solutions.

Session 4
Focus on communication and advocacy:
Communication skills in IPC;
Choosing the right communication channels;
Leadership and conflict resolution.

WHO IPC Training Package: Leadership module
http://www.who.int/infection-prevention/tools/core-components/en/
THE ROLE OF INFECTION PREVENTION AND CONTROL IN PREVENTING ANTIBIOTIC RESISTANCE IN HEALTH CARE

On average, 1 in every 10 patients is affected by health care-associated infections (HAIs).
- Antibiotic-resistant HAIs can double or more, the likelihood of death.
- Over 50% of surgical site infections can be resistant to antibiotics.

Effective infection prevention and control (IPC) and water, sanitation and hygiene (WASH) stops the spread of antibiotic-resistant organisms.

IPC and WASH in health care protects patients and health workers from avoidable infections.

The building blocks of IPC and WASH in health care facilities are:
- effective hygiene practices, including hand hygiene
- core components of IPC programmes
- a clean, well-functioning environment and equipment

This leads to:
- less spread of antibiotic-resistant organisms
- a reduced need for antibiotics

Every infection prevented is an antibiotic treatment avoided.
- Play your role in controlling antibiotic resistance!
- Ensure IPC programmes are in place and champion IPC practices.

IPC saves millions of lives every year.


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http://www.who.int/infection-prevention/en/
Patient centeredness and IPC integration into clinical practices
PATIENT ADVOCACY GROUPS

Ask for clean care
It’s your right

#InfectionPrevention
#HandHygiene  #HealthForAll

Be part of the WHO SAVE LIVES:
Clean YOUR Hands campaign
Integration of SSI prevention in the surgical patient journey

Continuous Improvement

CHECK
Did things happen according to plan?

DO
Do what was planned

PLAN
What to do? How to do it?

ACT
How to improve next time?

Continuous Improvement
Stepwise approach

Step 1: Preparing for action

Step 2: Baseline assessment

Step 3: Developing and executing the plan

Step 4: Evaluating impact

Step 5: Sustaining the programme over the long-term

Multimodal improvement strategy embedded within each step in the cycle of continuous improvement

The step-wise approach

1. Preparing for action
2. Baseline assessment
3. Developing and executing the plan
4. Evaluating impact
5. Sustaining the programme over the long-term

STEP 1
PREPARING FOR ACTION
Step 5: Sustaining the programme over the long-term

Step 1: Preparing for action

Step 2: Baseline assessment

Step 3: Developing and executing the plan

Step 4: Evaluating impact

Multimodal improvement strategy embedded within each step in the cycle of continuous improvement

STEP 4 ASSESSING IMPACT
**STEP 5**
SUSTAINING THE PROGRAMME OVER THE LONG TERM

- **Step 1** Preparing for action
- **Step 2** Baseline assessment
- **Step 3** Developing and executing the plan
- **Step 4** Evaluating impact
- **Step 5** Sustaining the programme over the long-term

Multimodal improvement strategy embedded within each step in the cycle of continuous improvement.
What help you can find

**PRACTICAL TIPS, KEY CONSIDERATIONS AND ACTIONS**

**IMPLEMENTATION BARRIERS AND SOLUTIONS**

**TOOLS AND RESOURCES**

**CASE STUDY EXAMPLES**

http://www.who.int/infection-prevention/tools/core-components/en/
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<td>• Put in place/improve a sustainable system to ensure that SAP orders are not continued after the operation (connected to electronic patient records, if existing).</td>
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<td><strong>SAFETY CLIMATE AND CULTURE CHANGE</strong> ('live it')</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Engage leaders and champions among surgical and anaesthesiology staff to drive change on SAP discontinuation.</td>
<td></td>
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<tr>
<td></td>
<td>• Organize meetings and focus group discussions with all the right people to discuss the reasons for discontinuing SAP in the context of the local protocol.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Engage senior management to issue messages on a regular basis to support SAP discontinuation that are also linked to reducing AMR in the facility.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

http://www.who.int/infection-prevention/tools/surgical/en/
WHO approach for guidelines development & implementation

2015-2019: 6 guidelines, about 60 implementation tools, 10 scientific papers
Liberia: core components prioritization

1. CC 3 - Training (2015-)
2. CC6 - Monitoring (2015-)
3. CC1 - Nat IPC programme (2016)
6. CC8 - Built environment (2016-)
7. CC2 - Guidelines (2017-18)
8. CC4 - HAI (SSI) surveillance (2018-)
Critical factors at the national level

- Sense of urgency created by the outbreak emergency
- Political commitment and leadership
- Collective commitment
- Collaboration with partners
- Local empowerment
- Critical use of data
- Mentorship and external quality control to facilities by MOH and WHO
Impact of the WHO Hand Hygiene multimodal promotion strategy

Allegranzi B et al, Lancet ID 2013

Global implementation of WHO’s multimodal strategy for improvement of hand hygiene: a quasi-experimental study

Summary
Background Health-care-associated infections are a major threat to patient safety worldwide. Transmission is mainly via the hands of health-care workers, but compliance with recommendations is usually low and effective improvement strategies are needed. We assessed the effect of WHO’s strategy for improvement of hand hygiene in five countries.

Methods
We did a quasi-experimental study between December 2006 and December 2008 at six pilot sites (45 departments at 41 hospitals in Costa Rica, Italy, Mali, Pakistan, and Saudi Arabia), a strategy was implemented in five countries.

Results
Significant increase of health-care workers hand hygiene compliance across all professional categories in all wards (OR 2.15, 1.99–2.32; compliance from 51.0% to 67.2%) and across all levels of resources

Luangasanatip N et al, BMJ 2015

Meta-analysis from 22 studies confirmed that the WHO hand hygiene improvement strategy is effective at increasing health care workers compliance

Results of 19 studies showed reduction of healthcare-associated infections

Testing the SSI prevention approach

Clack L, et al. Antimicrob Resist & Infect Control, in press
Multidisciplinary local teams

LAUNCHING THE SUSP PROJECT

Kijabe SUSP Team with Benedetta

The SUSP Team with the infection control committee held a launch ceremony of WHO Surgical Unit Safety Program (SUSP) Project on Tuesday April 8th in the KH chapel.

The ceremony was officiated by Dr. Benedetta Allegri WHO Technical Lead.

She made some presentations on patient safety and importance of the study.

Benedetta Speech

Kijabe SUSP Team with Senior Management Team

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World Health Organization
Local identification of priority measures for improvement & tools development and adaptation

Organizational culture change

- Antibiotic prophylaxis
- OR discipline
- Surgical site skin preparation
- Surgical hand preparation
- Modified WHO checklist
- No Hair removal
- Pre-op Bath
Understanding and influencing the local culture: tools created by local teams

Take 3 steps to make your surgical patient safe by preventing wound infections!

1. Pre-operative
   - Patient briefing
     - Make sure the patient takes a shower or bath and washes with soap on the day of the operation or the evening before. This helps remove bacteria from the skin and reduces the risk of wound infection.
   - Avoid hair removal
     - Avoid removing hair using depilatory creams or alcohol-based solutions after each patient, as this may damage the skin, which can lead to infection.

2. Peri-operative
   - Surgical hand preparation
     - Follow all the steps of a good hand preparation technique before entering the operating room: wash and rinse for 3-5 min with an alcohol-based solution for 2-3 min.
   - Appropriate antibiotic prophylaxis needs to be:
     - Focused antibiotic for the operation
     - Fertile site
     - Right time (30 min before the incision)
     - Appropriate dissemination step after surgery.

3. Intra-operative
   - Appropriate skin preparation
     - Clean non-sterile sites with soap and water and then use aseptic skin preparation solutions.
   - Sterile barrier should be used in the OR.
   - Only essential staff should be in the OR.
   - Sterile dressings will prevent spreading bacteria.

*Operating Room

http://www.who.int/infection-prevention/countries/surgical/en/
## Impact on preventive measures

<table>
<thead>
<tr>
<th></th>
<th>Baseline (n=1604)</th>
<th>Follow-up (n=1827)</th>
<th>p value</th>
<th>Sustainability period (n=891)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative patient bathing (n=4321, 0.02%)</td>
<td>1238 (77.2)</td>
<td>1544 (84.5)</td>
<td>&lt;0.0001</td>
<td>799 (89.7)</td>
</tr>
<tr>
<td>Appropriate hair removal (n=4310, 0.3%)</td>
<td>1169 (73.1)</td>
<td>1702 (93.5)</td>
<td>&lt;0.0001</td>
<td>880 (98.8)</td>
</tr>
<tr>
<td>Appropriate skin preparation (n=4307, 0.3%)</td>
<td>330 (20.7)</td>
<td>1644 (90.2)</td>
<td>&lt;0.0001</td>
<td>845 (94.8)</td>
</tr>
<tr>
<td>Quality of surgical hand preparation (n=4223, 2.3%)</td>
<td>1213 (78.7)</td>
<td>1694 (94.4)</td>
<td>&lt;0.0001</td>
<td>865 (97.4)</td>
</tr>
<tr>
<td>Appropriate use of antibiotic prophylaxis (n=4322, 0%)</td>
<td>205 (12.8)</td>
<td>714 (39.1)</td>
<td>&lt;0.0001</td>
<td>635 (71.3)</td>
</tr>
</tbody>
</table>

**Theatre discipline**

- Theatre door openings per hour of operation time (n=4031, 6.7%)
  - Baseline: 14.8 (17.8)
  - Follow-up: 14.2 (16.1)
  - p value: 0.3771
  - Sustainability period: 19.0 (21.6)

- Number of individuals present at the start of the operation (n=4313, 0.2%)
  - Baseline: 8.3 (3.4)
  - Follow-up: 7.7 (2.5)
  - p value: <0.0001
  - Sustainability period: 7.4 (2.5)

- Number of entries during the operation (n=4236, 2.0%)
  - Baseline: 5.0 (4.1)
  - Follow-up: 4.8 (4.9)
  - p value: 0.1758
  - Sustainability period: 4.2 (2.7)

Data are mean (SD). Data per variable and percentage missing data are also given. SSI = surgical site infection.

*Table 2: Process indicators for SSI prevention intervention measures across study periods in four (baseline and follow-up) and three (sustainability period) hospitals*
Impact on SSI

Figure 2: Unadjusted SSI cumulative incidence overall and by site at baseline and follow-up in four sites. Error bars show 95% CIs. SSI—surgical site infection.
Summary of success factors for SSI prevention implementation

- Use of multimodal strategies
- Having a dedicated multidisciplinary team and a step-wise action plan
- Mapping recommendations according to the surgical patient journey
- Empowering teams involving front-line staff and letting teams take the lead on adaptation
- Engaging leadership
- Catalysing collective and individual ownership
- Using data to create awareness
- Awarding teams and work demonstrating a safety culture spirit

WHO approach for guidelines development & implementation

2015-2019: 6 guidelines, about 60 implementation tools, 10 scientific papers

Guidelines

Implementation strategies & tools

Testing & research

Evidence & consensus

Dissemination
Infection prevention and control

SAVE LIVES: Clean Your Hands 5 May 2019

Clean care for all – it's in your hands
WHO calls on everyone to be inspired by the global movement to achieve universal health coverage (UHC), i.e. achieving better health and well-being for all people at all ages, including financial risk protection, access to quality essential health care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. Infection Prevention and Control, including hand hygiene, is critical to achieving UHC as it is a practical and evidence-based approach with demonstrated impact on quality of care and patient safety across all levels of the health system.

Read more about 5 May 2019 here

Health care-associated infections
10%
1 in 10 patients get an infection while receiving care.

Surgical site infections
50%
More than 50% of surgical site infections can be antibiotic-resistant.

Impact of infection prevention and control
30%
Effective infection prevention and control reduces health care-associated infections by at least 30%.

About us
Our work
Infection prevention and control global unit overview

WHO Collaborations
Water sanitation and health
Antimicrobial resistance
Patient safety
Quality in universal health coverage
Private organizations for patient safety
Global Infection Prevention and Control Network

Campaigns
SAVE LIVES: Clean Your Hands
Infection safety
2016 Global Survey
More information here

News and events
Current news
Newsletter
Conferences
Meetings and events
More information here

Contact us
Infection prevention and control global unit
Service Delivery and Safety
World Health Organization
29 Avenue Appia
1211 Geneva 27
Switzerland
Email: savelives@who.int

Work in countries
Hand hygiene
Surgical site infections
Core components for IPC

Evidence, guidelines and publications
Hand hygiene
Surgical site infections

Implementation tools and resources
Hand hygiene
Surgical site infections
Multi-media dissemination

https://www.youtube.com/watch?v=LZapz2L6J1Q&feature=youtu.be
https://www.youtube.com/watch?v=nw9TMfqc3cE
https://youtu.be/G2PUBbeHyVs
SAVE LIVES: Clean Your Hands: an ongoing worldwide campaign

As of 1 May 2019, 22,144 facilities in 182 countries – covering over 13 million staff and over 5.1 million beds

WHO IPC Training Package

- Leadership and IPC program management
- Prevention of urinary tract infections
- Prevention of catheter-associated bloodstream infections
- Prevention of respiratory tract infections
- Prevention of surgical site infections
- Reprocessing of medical devices
- Outbreak management in healthcare settings
- IPC to control antibiotic resistance
- HAI surveillance
- Injection safety

https://www.who.int/infection-prevention/en/
Global Learning Laboratory: IPC & WASH Learning Pod

National Quality Policy & Strategy

IPC & WASH

Compassion

IPC & WASH Learning Agenda

Learning & Knowledge flow

Register to join the IPC & WASH Learning Pod:
http://www.who.int/servicedeliverysafety/areas/qhc/gll/en/
Save the Date:
5th ICPIC, 10-13 Sept 2019, Geneva, Switzerland

Semmelweis at ICPIC

www.icpic.com
Follow and like
@WHO
@didierpittet
@GLOBAL_POPS
https://www.who.int/infection-prevention/campaigns/clean-hands/5may2019/en/
www.cleanhandssaveslives.org

#HandHygiene
#HealthForAll
#InfectionPrevention
WHO approach for guidelines development & implementation

2015-2019: 6 guidelines, about 60 implementation tools, 10 scientific papers

Evidence & consensus | Guidelines | Implementation strategies & tools | Testing & research | Dissemination | Measuring impact
Stepwise approach

**Step 1**
Preparing for action

**Step 2**
Baseline assessment

**Step 3**
Developing and executing the plan

**Step 4**
Assessing impact

**Step 5**
Sustaining the programme over the long-term

Multimodal improvement strategy embedded within each step in the cycle of continuous improvement

### Hand Hygiene Self-Assessment Framework 2010

**Introduction and user instructions**

The Hand Hygiene Self-Assessment Framework is a systematic tool with which a situation analysis of hand hygiene practices is performed in an individual healthcare facility.

**What is its purpose?**

While providing an opportunity to reflect on existing resources and achievements, the Hand Hygiene Self-Assessment Framework also helps to focus on future plans and challenges. It acts as a diagnostic tool, identifying key issues requiring attention and improvement. The results can be used to facilitate development of an action plan for the facility's hand hygiene promotion programme. Repeated use of the Hand Hygiene Self-Assessment Framework will also allow documentation of progress with time.

**Who should use the Hand Hygiene Self-Assessment Framework?**

This tool should be used by managers in charge of implementing a strategy to improve hand hygiene within a healthcare facility. If strategy is being implemented, then it can also be used by professionals in charge of infection control or senior managers at the facility. The framework can be used globally, by healthcare facilities at all levels of progress as far as hand hygiene concerns are concerned.

**How is it structured?**

The Hand Hygiene Self-Assessment Framework is divided into five components: 1) Indicators. The five components correspond to the WHO Multifaceted Hand Hygiene Improvement Strategy [http://www.who.int/gpsc/home/en/index.html]. Each component is divided into items that indicate key features of each component. These indicators are based on evidence and expert consensus and have been framed as questions with defined answers (either "yes" or "no") to facilitate self-assessment. Based on the score achieved for the five components, the facility is assigned to one of four levels of hand hygiene promotion and practice: Inadequate, Basic, Intermediate, and Advanced. Inadequate: hand hygiene practices and hand hygiene promotion are deficient. Significant improvement is required. Basic: some measures are in place, but not to a satisfactory standard. Further improvement is required. Intermediate: some appropriate hand hygiene promotion strategies in place and hand hygiene practices are improved. It is now crucial to develop long-term plans to ensure that improvement is sustained and progresses. Advanced: hand hygiene promotion and optimal hand hygiene practices have been sustained and improved, helping to embed a culture of safety in the healthcare setting.

**Score**

- **0-125**: Inadequate
- **126-250**: Basic
- **251-375**: Intermediate
- **376-500**: Advanced

**Hand Hygiene Level**

**Interpretation**

- **HH practices and promotion are deficient. Significant improvement is required.**
- **Some HH measures are in place, but not to a satisfactory standard. Further improvement is required.**
- **An appropriate HH promotion strategy is in place and HH practices have improved. It is now crucial to develop long-term plans to ensure that improvement is sustained and progresses.**
- **HH promotion and optimal HH practices have been sustained and/or improved, helping to embed a culture of safety in the healthcare setting.**


[www.who-ipc-survey.org](http://www.who-ipc-survey.org)
Major article

Status of the implementation of the World Health Organization multimodal hand hygiene strategy in United States of America health care facilities

Benedetta Allegranzi MD,a, Laurie Conway RN, MS, CICb, Elaine Larson RN, PhD, FAAN, CICb, Didier Pittet MD, MS c,*

bColumbia University School of Nursing, Columbia University, New York, NY
cInfection Control Program and WHO Collaborating Centre on Patient Safety, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland


Key Words:
WHO multimodal strategy
Health care-associated infection
Infection control
IDS hospitals
WHO Hand Hygiene Self-Assessment Framework

Short report

Kilpatrick et al. J Hosp Infect 2018; 100: 202-206

Global hand hygiene improvement progress: two surveys using the WHO Hand Hygiene Self-Assessment Framework

C. Kilpatrick a, E. Tartari b,c, A. Gayet-Ageron b,d, J. Storr a, S. Tomczyk a, B. Allegranzi a, D. Pittet b,*

aInfection Prevention and Control Global Unit, Department of Service Delivery and Safety, World Health Organization, Geneva, Switzerland
bInfection Control Programme and WHO Collaborating Centre on Patient Safety, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland
cDepartment of Nursing, Faculty of Health Sciences, University of Malta, Msida, Malta
dDepartment of Health and Community Medicine, Division of Clinical Epidemiology, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland
Core components assessment tool for the national level – IPCAT 2

Instructions for the national infection prevention and control assessment tool 2 (IPCAT2)

Updated July 2017

http://www.who.int/infection-prevention/tools/core-components/en/
## Core component 1: Infection Prevention and Control (IPC) programme

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you have an IPC programme?</td>
<td>□ No</td>
<td>0</td>
</tr>
<tr>
<td>Choose one answer</td>
<td>□ Yes, without clearly defined objectives</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>□ Yes, with clearly defined objectives and annual activity plan</td>
<td>10</td>
</tr>
<tr>
<td>2. Is the IPC programme supported by an IPC team comprising of IPC professionals?</td>
<td>□ No</td>
<td>0</td>
</tr>
<tr>
<td>Choose one answer</td>
<td>□ Not a team; only an IPC focal person</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>□ Yes</td>
<td>10</td>
</tr>
<tr>
<td>3. Does the IPC team have at least one full-time IPC professional or equivalent (nurse or doctor working 100% in IPC) available?</td>
<td>□ No IPC professional available</td>
<td>0</td>
</tr>
<tr>
<td>Choose one answer</td>
<td>□ No only a part-time IPC professional available</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>□ Yes one per &gt; 250 beds</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>□ Yes one per ≤ 250 beds</td>
<td>10</td>
</tr>
<tr>
<td>4. Does the IPC team or focal person have dedicated time for IPC activities?</td>
<td>□ No</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>□ Yes</td>
<td>10</td>
</tr>
<tr>
<td>5. Does the IPC team include both doctors and nurses?</td>
<td>□ No</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>□ Yes</td>
<td>10</td>
</tr>
<tr>
<td>6. Do you have an IPC committee actively supporting the IPC team?</td>
<td>□ No</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>□ Yes</td>
<td>10</td>
</tr>
</tbody>
</table>

### Box 8. IPCAF scoring interpretation

<table>
<thead>
<tr>
<th>Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-200</td>
<td>Inadequate. IPC core components’ implementation is deficient. Significant improvement is required.</td>
</tr>
<tr>
<td>201-400</td>
<td>Basic. Some aspects of the IPC core components are in place, but not sufficiently implemented. Further improvement is required.</td>
</tr>
<tr>
<td>401-600</td>
<td>Intermediate. Most aspects of IPC core components are appropriately implemented. Continue to improve the scope and quality of implementation and focus on the development of long-term plans to sustain and further promote the existing IPC programme.</td>
</tr>
<tr>
<td>601-800</td>
<td>Advanced. The IPC core components are fully implemented according to the WHO recommendations and appropriate to the needs of your facility.</td>
</tr>
</tbody>
</table>

[www.who-ipc-survey.org](http://www.who-ipc-survey.org)
WHO 2019 Global Survey on Infection Prevention and Control and Hand Hygiene

Facility-level assessments in a spirit of improvement

16 January – 16 July

All health care facilities and countries are invited to participate!


Submit here: www.who-ipc-survey.org
Training videos on the use of the tools

Infection prevention and control facility-level assessments using WHO standardized tools in a spirit of improvement – Training video

Infection Prevention and Control Global Unit
WHO HQ

https://youtu.be/yMJPVtma9l0
https://youtu.be/PDz8kxrPaMk

Hand Hygiene Self-assessment Framework – training video

WHO 2019 Global Survey on Infection Prevention and Control and Hand Hygiene

Professor Didier Pittet, MD, MS, CBE
“It always seems impossible, until it’s done”

“We can change the world and make it a better place. It is in your hands to make a difference.”

~ Nelson Rolihlahla Mandela
Thank you for participating in the WHO 2019 Global Survey on Infection Prevention and Control and Hand Hygiene

Learn more at: https://www.who.int/infection-prevention/campaigns/ipc-global-survey-2019/en/
Send a request to participate and enquiries to: who_ipc Globalsurvey@who.int