Hand Hygiene Promotion Universal Spread: Impact and Patient Participation
Prof Didier Pittet & Margaret Murphy
Sponsored by the WHO First Global Patient Safety Challenge – Clean Care is Safer Care

**Outline**
- Lessons learned from projects in the field of healthcare-associated infection prevention & control
- Two key examples
  1. Promoting and scaling up hand hygiene improvement worldwide
  2. Local adaptation of a safe surgery project aiming to reduce surgical site infections
- Underlying themes:
  - The importance of leadership and evidence-based approaches
  - Local adaptation according to culture and available resources
  - Patient safety culture at the foundation of infection control best practices implementation

**Burden of major infections worldwide**

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**Lessons learned in accelerating patient safety across countries and cultures through WHO “change models”**

Benedetta Allegranzi
Lead, Clean Care is Safer Care & Special Programmes, WHO Patient Safety Programme, HQ
Professor of Public Health, University of Geneva, Geneva, Switzerland

ISQua 2013, 13 – 16 October, 2013, Edinburgh, UK

**Through the promotion of best practices in hand hygiene and infection control, Clean Care is Safer Care aims to reduce healthcare-associated infection (HAI) worldwide**

First Global Patient Safety Challenge

**Germ cross-transmission between patient A and patient B, devices and environment via hands**

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Impact of hand hygiene promotion on HAI

- 1977- April 2013, 45 studies investigated the impact of hand hygiene to reduce HAI
- 41 showed that behavioural change, illustrated by improvement of hand hygiene practices, leads to the reduction of HAI
- Only 4/44 studies showed no significant impact on HAI but in 2 hand hygiene compliance did not increase significantly

Compliance with hand hygiene in different health-care facilities - Worldwide

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Sector</th>
<th>Compliance (%)</th>
</tr>
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<tbody>
<tr>
<td>Preston</td>
<td>1981</td>
<td>General Wards</td>
<td>16</td>
</tr>
<tr>
<td>Albert</td>
<td>1981</td>
<td>ICU</td>
<td>41</td>
</tr>
<tr>
<td>Larson</td>
<td>1983</td>
<td>Hospital-wide</td>
<td>45</td>
</tr>
<tr>
<td>Donowitz</td>
<td>1987</td>
<td>Neonatal ICU</td>
<td>30</td>
</tr>
<tr>
<td>Graham</td>
<td>1990</td>
<td>ICU</td>
<td>32</td>
</tr>
<tr>
<td>Dubbert</td>
<td>1990</td>
<td>ICU</td>
<td>81</td>
</tr>
<tr>
<td>Pettinger</td>
<td>1991</td>
<td>Surgical ICU</td>
<td>51</td>
</tr>
<tr>
<td>Meengs</td>
<td>1994</td>
<td>Emergency Room</td>
<td>32</td>
</tr>
<tr>
<td>Doebbeling</td>
<td>1992</td>
<td>Neonatal Unit</td>
<td>30</td>
</tr>
<tr>
<td>Pittet</td>
<td>1999</td>
<td>Hospital-wide</td>
<td>43</td>
</tr>
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</table>

Average: 38.7%

WHO Guidelines on Hand Hygiene in Health Care 2009, Chapter 16

1st GPSC Change Model
3 main objectives

1. Awareness raising
2. Mobilising nations
3. Technical guidelines and tools

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Political commitment is essential to achieve improvement in infection control

- Ministerial pledges to the 1st Global Patient Safety Challenge

I resolve to work to reduce health care-associated infection (HCAI) through actions such as:
- acknowledging the importance of HCAI;
- hand hygiene campaigns at national or sub-national levels;
- sharing experiences and available surveillance data, if appropriate;
- using WHO strategies and guidelines…

132 Countries committed to address health care-associated infection (June 2013 update)
World population coverage: 93.5%

Countries/areas running hand hygiene campaigns (50 campaigns)
3 new campaigns in 2013: Algeria, Benin, New Zealand

Adoption and adaptation of Clean Care is Safer Care worldwide

From country pledges… to patient point of care

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Implementation strategy and toolkit for the WHO Guidelines on Hand Hygiene in Health Care

Knowledge & evidence → Action

ONE System change
Alcohol-based handrub at point of care and access to safe continuous water supply, soap and towels

TWO Training and education
Providing regular training to all health-care workers

THREE Evaluation and feedback
Monitoring hand hygiene practices, infrastructures, perceptions, & knowledge, while providing results feedback to health-care workers

FOUR Reminders in the workplace
Prompting and reminding health-care workers

FIVE Institutional safety climate
Individual active participation, institutional support, patient participation


WHO Multimodal Hand Hygiene Improvement Strategy

From modern health care settings

To settings with limited resources

In a multi-cultural environment

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Saudi Arabia: overcoming religious barriers

Commitment of ministerial and hospital authorities (Mali)

Hand hygiene champions

Local production of ABHR according to the WHO formulation

System change made possible
WHO alcohol-based formulation local production
Global Survey 2012

Cost: 0.30 $US/100 ml; 0.006% of the total annual hospital budget

39 sites in 28 countries

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Advantages and barriers

### Advantages

<table>
<thead>
<tr>
<th>Advantage</th>
<th>No of sites involved with data available (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less expensive than marketed alcohol-based handrubs</td>
<td>7/9 (78)</td>
</tr>
<tr>
<td>Excellent tolerance and acceptability</td>
<td>30/34 (88)</td>
</tr>
<tr>
<td>Used in health facility as part of a multimodal approach to improve hand hygiene</td>
<td>30/34 (88)</td>
</tr>
<tr>
<td>Manufactured from locally-sourced alcohol</td>
<td>28/39 (72)</td>
</tr>
</tbody>
</table>

### Barriers to production

<table>
<thead>
<tr>
<th>Barriers to production</th>
<th>No of sites involved with data available (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff needed training on production process</td>
<td>29/39 (74)</td>
</tr>
<tr>
<td>Occasional difficulty in procuring ingredients locally</td>
<td>20/39 (51)</td>
</tr>
<tr>
<td>Difficulty in procuring appropriate dispensers</td>
<td>19/37 (51)</td>
</tr>
<tr>
<td>Barriers to quality control</td>
<td></td>
</tr>
<tr>
<td>Suboptimal reprocessing of dispensers</td>
<td>11/24 (46)</td>
</tr>
<tr>
<td>No equipment available to perform quality control locally</td>
<td>11/24 (46)</td>
</tr>
<tr>
<td>Barrier to acceptability</td>
<td></td>
</tr>
<tr>
<td>Unpleasant smell</td>
<td>4/38 (11)</td>
</tr>
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Support from Private Organizations for Patient Safety (POPS)
sharing costs and leveraging all possibilities

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

Allegranzi B. et al. *Lancet Infectious Diseases*, 2013; Aug 22

- 55 departments in 43 hospitals in 5 countries (Costa Rica, Italy, Mali, Pakistan, and Saudi Arabia).
- Major effect on health-care workers hand hygiene compliance across all professional categories in all sites (OR 2.15, 1.99–2.32; significant compliance increase from 51.0% to 67.2%).
- Greater effect of the intervention in low-income and middle-income countries (OR 4.67, 95% CI 3.16–6.89; p<0.001) than in high-income countries (2.19, 2.03–2.37; p<0.001).
- Switch to alcohol-based handrubs in all sites (49.1% of all hand hygiene actions at baseline vs 70.6% at follow-up).
- Significant improvement in health-care workers’ knowledge at all sites (p<0.001).
- Demonstration of implementation feasibility and adaptability of the WHO Multimodal Hand Hygiene Improvement Strategy and to toolkit.
- 2 years after the intervention, sustained or further improvement in all sites, including national scale-up.

Indicators of long-term sustainability (2 years follow-up)

<table>
<thead>
<tr>
<th>Strategy implementation continued</th>
<th>Number of sites/total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>Strategy implementation continued</td>
</tr>
<tr>
<td>Alcohol-based handrub continued to be available</td>
<td>5/5 All</td>
</tr>
<tr>
<td>Educational sessions repeated at least once a year</td>
<td>5/5 All</td>
</tr>
<tr>
<td>Hand hygiene compliance monitoring and performance feedback repeated regularly</td>
<td>4/5 Costa Rica, Mali, Saudi Arabia</td>
</tr>
<tr>
<td>Poster use continued and refreshed</td>
<td>5/5 All</td>
</tr>
<tr>
<td>Implementation expanded to other hospitals in the country</td>
<td>5/6 Costa Rica, Italy, Mali, Saudi Arabia</td>
</tr>
<tr>
<td>Launch or sustainment of a national campaign following pilot testing</td>
<td>4/6 Costa Rica, Italy, Saudi Arabia</td>
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National Hand Hygiene Compliance 2009 - 2012

15782 registered health-care facilities from 168 countries
More than 9.2 mio health-care staff and 3.9 mio patient beds

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Lessons learned – steps to catalyze change
• Identify the problem and its magnitude
• Identify evidence-based solutions
• Gather political commitment and leadership
• Develop a sound communication strategy
• Demonstrate that intervention works and it’s feasible
• Develop culture- and resource-based adaptations
• Provide feedback at all levels
• Catalyze large-scale spread
• Identify and support factors that favor sustainability

Integration between infection control & patient safety
Example 2: the Surgical Unit-based Safety Programme (SUSP)
Building upon the successful experience of the Comprehensive Unit-based Safety Program (CUSP) applied to CLA-BSI prevention

CLA-BSI prevention = infection control + patient safety culture approach

5 evidence-based recommendations to reduce CLA-BSI (CDC):
1. hand hygiene
2. using full barrier precautions
3. cleaning the skin with chlorhexidine
4. avoiding the femoral site when possible
5. removing unnecessary catheters

CUSP & TRIP APPROACH
• Clinicians education
• CL cart
• Checklist for adherence to measures
• Professionals stopped if not adhering
• CL removal discussed in daily rounds
• Feedback on CLA-BSI

CLA-BSI Rates from 1100 Hospitals across 44 states 2008 -2012

40% reduction

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### Adjusted period incidence rates estimations for catheter-related infection in 192 ICUs in Spain

Palomar CCM 2013

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### Surgical site infection: the most frequent type of HAI in developing countries

- Allegranzi B et al. Lancet 2011;377:228-41
- WHO Report on the burden of endemic healthcare-associated infections worldwide

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### SSI prevention - Surgical Unit-based Safety Programme (SUSP) approach

- Funded by Agency for Healthcare Research and Quality (AHRQ) and led by John Hopkins University (USA)
- WHO in charge of adaptation and implementation in international sites
- **Main objectives:** 1) To achieve significant reductions in surgical site infection (SSI) and surgical complication rates; 2) To achieve significant improvements in safety culture in OR and surgical wards
- **Intervention:** implementing teamwork, communication and safety culture improvement strategies together with evidence-based measures for the prevention of SSI

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### Application of CUSP to SSI prevention: SUSP

<table>
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<th>Component</th>
<th>Method</th>
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<tbody>
<tr>
<td>1. Science of safety education</td>
<td>Introductory talk to explain the approach to addressing safety at a local level</td>
</tr>
<tr>
<td>2. Staff safety assessment</td>
<td>Two question surveys to measure members knowledge: How will and SSI develop in the next patient? What can we do to prevent them</td>
</tr>
<tr>
<td>3. Senior executive partnership</td>
<td>Senior executive attends CUSP meetings, making resources available to address safety concerns and assist with system-wide barriers</td>
</tr>
<tr>
<td>4. Learning from defects</td>
<td>Teams are trained to use a standardized tool to learn from defects</td>
</tr>
<tr>
<td>5. Implement teamwork and communication tools</td>
<td>Review unit-level safety data (eg. SSI) monthly and develop local quality improvement initiatives to improve teamwork, communication and address identified hazards</td>
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CUSP: Comprehensive Unit-Based Safety Programme; SSI, surgical site infections

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### Preliminary results – pilot study

- **Intervention:** CUSP +
  - standardization of skin preparation;
  - administration of preoperative chlorhexidine showers;
  - selective elimination of mechanical bowel preparation;
  - warming of patients in the preanesthesia area;
  - adoption of enhanced sterile techniques for skin and fascial closure;
  - addressing previously unrecognized lapses in antibiotic prophylaxis.
- **Before/after study in colorectal surgery**
- **Results:** mean SSI rate decrease (from 27.3% to 18.2%), 33.3% decrease (95% CI, 5–58%; p=0.05)


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Adaptation of SUSP for African sites: Infection control measures

- Patient pre-operative bathing
- Hair removal (not necessary or with clippers)
- Optimization of surgical site skin preparation
- Optimization of surgical hand preparation
- Optimization of surgical antibiotic prophylaxis (timing, dose, type of ATB, re-dosing)
- Discipline in the OR (limiting number of people and door opening during operation)

Thank you for your attention

To hear more, come to the breakfast session on injection safety, Wednesday 16 October, 7:45 am!

- Contact information
  WHO PATIENT SAFETY PROGRAMME
  patient.safety@who.int
  savelives@who.int

- Web sites
  http://www.who.int/patientsafety/en/
  www.who.int/gpsc/5may