Impact of Hand Hygiene improvement on health care-associated infection

Prof. M. Lindsay Grayson
National Hand Hygiene Initiative -- Hand Hygiene Australia
Infectious Diseases Department, Austin Health
University of Melbourne, Melbourne, Australia
Overview

• Background
• Outcome measures
  – 5 HH compliance
  – SAB rates
• Australian – nationwide program
• Future issues
Impact of hand hygiene promotion

– In the last 30 years, > 20 studies demonstrated the effectiveness of hand hygiene to reduce HAIs.
## Impact of hand hygiene promotion

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospital setting</th>
<th>Increase of hand hygiene compliance</th>
<th>Reduction of HCAI rates</th>
<th>Follow-up</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>Adult ICU</td>
<td>From 14% to 73% (before pt contact)</td>
<td>HCAI rates: from 33% to 10%</td>
<td>6 years</td>
<td>Conly et al</td>
</tr>
<tr>
<td>2000</td>
<td>Hospital-wide</td>
<td>From 48% to 66%</td>
<td>HCAI prevalence: from 16.9% to 9.5%</td>
<td>8 years</td>
<td>Pittet et al</td>
</tr>
<tr>
<td>2004</td>
<td>NICU</td>
<td>From 43% to 80%</td>
<td>HCAI incidence: from 15.1 to 10.7/1000 patient-days</td>
<td>2 years</td>
<td>Won et al</td>
</tr>
<tr>
<td>2005</td>
<td>Adult ICUs</td>
<td>From 23.1% to 64.5%</td>
<td>HCAI incidence: from 47.5 to 27.9/1000 patient-days</td>
<td>21 months</td>
<td>Rosenthal et al</td>
</tr>
<tr>
<td>2005</td>
<td>Hospital-wide</td>
<td>From 62% to 81%</td>
<td>Significant reduction in rotavirus infections</td>
<td>4 years</td>
<td>Zerr et al</td>
</tr>
<tr>
<td>2007</td>
<td>Neonatal unit</td>
<td>From 42% to 55%</td>
<td>HCAI incidence: overall from 11 to 8.2 infections/1000 patient-days and in very low birth weight neonates from 15.5 to 8.8 infections/1000 patient-days</td>
<td>27 months</td>
<td>Pessoa-Silva et al</td>
</tr>
<tr>
<td>2007</td>
<td>Neurosurgery</td>
<td>NA</td>
<td>SSI rates: from 8.3% to 3.8%</td>
<td>2 years</td>
<td>Thu et al</td>
</tr>
<tr>
<td>2008</td>
<td>1) 6 pilot health-care facilities 2) all public health-care facilities in Victoria (Aus)</td>
<td>1) from 21% to 48% 2) from 20% to 53%</td>
<td>MRSA bacteraemia: 1) from 0.05 to 0.02/100 patient-discharges per month; 2) from 0.03 to 0.01/100 patient-discharges per month</td>
<td>1) 2 years 2) 1 year</td>
<td>Grayson et al</td>
</tr>
<tr>
<td>2008</td>
<td>NICU</td>
<td>NA</td>
<td>HCAI incidence: from 4.1 to 1.2/1000 patient-days</td>
<td>18 months</td>
<td>Capretti et al</td>
</tr>
</tbody>
</table>

Effectiveness of a hospital-wide programme to improve compliance with hand hygiene

Didier Pittet, Stéphane Hugonnet, Stephan Harbarth, Philippe Mourouga, Valérie Sauvan, Sylvie Touveneau, Thomas V Perneger, and members of the Infection Control Programme

Intervention:

- System change (use of alcohol-based handrubs)
- Education of healthcare workers
- Monitoring and feedback of performance (compliance)
- Reminders in the work place (posters)
- Administrative support
- Leadership and culture change
"Talking walls"
Overall incidence of MRSA infections decreased from 2.16 to 0.93 episodes per 10,000 patient-days
Reduction in Surgical Site Infections in Neurosurgical Patients Associated With a Bedside Hand Hygiene Program in Vietnam

Le Thi Anh Thu, MD, PhD; Michael J. Dibley, MBBS, MPH; Vo Van Nho, MD, PhD; Lennox Archibald, MBBS, MD, FRCP, DTM&H; William R. Jarvis, MD; Annette H. Sohn, MD

Table 2. Comparison of Incidence Rate Ratio (IRR) of Surgical Site Infection Among Neurosurgical Patients Between the Wards A and B After the Hand Hygiene Intervention in Ward A, Cho Ray Hospital, Vietnam, July 11 to August 15, 2000, and July 14 to August 18, 2001

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ward A (1,789 patient-days)</th>
<th>Ward B (3,184 patient-days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of patients</td>
<td>No. of cases per 1,000 patient-days</td>
</tr>
<tr>
<td>SSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>6</td>
<td>3.4</td>
</tr>
<tr>
<td>Superficialb</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Deep</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>Organ/space</td>
<td>5</td>
<td>2.8</td>
</tr>
<tr>
<td>Wound classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean</td>
<td>2</td>
<td>...</td>
</tr>
<tr>
<td>Contaminated</td>
<td>3</td>
<td>...</td>
</tr>
<tr>
<td>Dirty</td>
<td>1</td>
<td>...</td>
</tr>
</tbody>
</table>

Note. The IRR for ward A was 1. CI, confidence interval.

a Adjusted for National Nosocomial Infection Surveillance System risk index, prophylaxis, and sex.
b IRRs were not calculated because of the value zero for ward A.
Reduction in Surgical Site Infections in Neurosurgical Patients Associated With a Bedside Hand Hygiene Program in Vietnam

Le Thi Anh Thu, MD, PhD; Michael J. Dibley, MBBS, MPH; Vo Van Nho, MD, PhD; Lennox Archibald, MBBS, MD, FRCP, DTM&H; William R. Jarvis, MD; Annette H. Sohn, MD

**Table 2.** Comparison of Incidence Rate Ratio (IRR) of Surgical Site Infection Among Neurosurgical Patients Between the Wards A and B After the Hand Hygiene Intervention in Ward A, Cho Ray Hospital, Vietnam, July 11 to August 15, 2000, and July 14 to August 18, 2001

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ward A (1,789 patient-days)</th>
<th>Ward B (3,184 patient-days)</th>
<th>Adjusted IRR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of patients</td>
<td>No. of cases</td>
<td>No. of patients</td>
</tr>
<tr>
<td>All</td>
<td>6</td>
<td>3.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Superficial&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0</td>
<td>0</td>
<td>2.2</td>
</tr>
<tr>
<td>Deep</td>
<td>1</td>
<td>0.9</td>
<td>4.5</td>
</tr>
<tr>
<td>Organ/space</td>
<td>12</td>
<td>2.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Wound classification</td>
<td>12</td>
<td>2.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Clean</td>
<td>11</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Contaminated</td>
<td>8</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Dirty</td>
<td>4</td>
<td>1.2</td>
<td>1.2</td>
</tr>
</tbody>
</table>

NOTE. Adjusted IRR for ward A was 1. CI, confidence interval.
<sup>a</sup> Adjusted for National Nosocomial Infection Surveillance System risk index, prophylaxis, and sex.
<sup>b</sup> IRRs were not calculated because of the value zero for ward A.

SSI rate reduced by 54% in the intervention ward, more than half of superficial SSIs eliminated.
Trends in MRSA from 2005 to March 2009

- Three or more days after admission
- Within two days of admission
- Non-acute trust

Reports of MRSA bacteraemia

Oct/05 - Mar/06  Apr/06 - Sep/06  Oct/06 - Mar/07  Apr/07 - Sep/07  Oct/07 - Mar/08  Apr/08 - Sep/08  Oct/08 - Mar/09
MRSA isolates and patient-episodes of bacteraemia

After 36 months:

Total MRSA isolates:
- 40% reduction (95% CI, 23–58%)
- 1008 fewer clinical isolates

Patients with MRSA bacteraemia:
- 57% reduction in monthly rate (95% CI, 38–74%)
- 53 fewer bacteraemias than expected (95% CI, 36–68 episodes)

MRSA isolates and patient-episodes of bacteraemia

After 36 months:

**Total MRSA isolates:**
• 40% reduction (95% CI, 23%–58%)
• 1008 fewer clinical isolates

**Patients with MRSA bacteraemia:**
• 57% reduction in monthly rate (95% CI, 38%–74%)
• 53 fewer bacteraemias than expected (95% CI, 36–68 episodes)

Cost to maintain program = $2.50 per patient admission (approx. 2/3 price of a BigMac)

Hand Hygiene Compliance

1 Pilot program: hand hygiene (HH) compliance at each of the six pilot program hospitals before and after introduction of the HHCCP*

HHCCP = hand hygiene culture-change program. * Mean HH compliance increased significantly over the 24 months of the pilot study (P<0.001).
Hand Hygiene Compliance

1 Pilot program: hand hygiene (HH) compliance at each of the six pilot program hospitals before and after introduction of the HHCCP*

HHCCP = hand hygiene culture change program

Mean HH compliance increased significantly over the 24 months of the pilot study (P<0.001).
MRSA isolates & bacteraemias

4 Pilot program: number of clinical MRSA isolates per 100 patient discharges (PD) per month before and after introduction of the HHCCP*

HHCCP = hand hygiene culture-change program. MRSA = methicillin-resistant Staphylococcus aureus.
* A statistically significant reduction in clinical MRSA isolates was noted at 24 months after the start of the intervention ($P = 0.003$ for trend).

3 Pilot program: number of patients with MRSA bacteraemia per 100 patient discharges (PD) per month before and after introduction of the HHCCP*

HHCCP = hand hygiene culture-change program. MRSA = methicillin-resistant Staphylococcus aureus.
* A statistically significant reduction in bacteraemias was noted at 24 months after the start of the intervention ($P = 0.003$ for trend).

MRSA isolates or bacteraemias per month per 100 separations
MRSA isolates & bacteraemias

716 (95% CI: 269-1162) fewer MRSA clinical isolates in the 6 Pilot hospitals than expected prior to the intervention

65 (95% CI: 5-126) fewer patients with MRSA bacteraemia in the 6 Pilot hospitals than expected prior to the intervention
Victorian HH Statewide Roll-out

- Two stages: May 06 - June 07
- All but two Victorian public hospitals participated
Statewide Hand Hygiene Compliance

HHCCP = hand hygiene culture-change program. * In Stage I hospitals, HH compliance increased from 18% (95% CI, 17%–19%; range, 13%–21%) at baseline to 51% (95% CI, 51%–52%; range, 26%–74%) after 11–12 months. In Stage II hospitals, HH compliance increased from 21% (95% CI, 21%–22%; range, 10%–44%) at baseline to 54% (95% CI, 53%–55%; range, 34%–83%) after 11–12 months. For both Stage I and Stage II hospitals, increases in overall HH compliance were significant for both baseline to 4 months (P < 0.001) and 4 to 12 months (P < 0.001).
Statewide Hand Hygiene Compliance

Overall HH Compliance: Baseline: 20% (95%CI 19-20%) to 11-12 mths: 53% (95%CI 52-53%) Increases significant after 4-mths and 12-mths (p<0.0001)

HHCCP = hand hygiene culture-change program.
* Overall HH compliance (for all hospitals [Stages I and II]) increased from 20% at baseline to 53% at 11-12 months. Increases in overall HH compliance were significant for both baseline to 4 months (P<0.001) and 4 to 12 months (P<0.001).
Statewide - MRSA bacteraemias

Patients with MRSA bacteraemia per month per 100 separations

8 Statewide roll-out: patients with MRSA bacteraemia per 100 patient discharges (PD) per month before and after introduction of the HHCCP*

HHCCP = hand hygiene culture-change program. MRSA = methicillin-resistant Staphylococcus aureus. *The number of patients with MRSA bacteraemia per 100 PD fell from 0.029 at 24 months before the intervention to 0.012 at 12 months after the start of the intervention (P = 0.09 for trend).
Statewide - MRSA isolates

Total clinical MRSA isolates per month per 100 separations

9 Statewide roll-out: total clinical MRSA isolates per 100 patient discharges (PD) per month before and after introduction of the HHCCP*

HHCCP = hand hygiene culture-change program. MRSA = methicillin-resistant Staphylococcus aureus.

*During the 24 months before the introduction of the HHCCP there was a significant reduction in rate of MRSA isolates per 100 PD per month ($P = 0.0003$ for trend). After the start of the intervention, the rate continued to decline, falling to a rate of 0.30/100 PD per month after 12 months ($P = 0.043$ for trend).
RESEARCH

Significant reductions in methicillin-resistant Staphylococcus aureus bacteremia and clinical isolates associated with a multisite, hand hygiene culture-change program and subsequent successful statewide roll-out

M Lindsay Grayson, Lisa J Jarvie, Rhea Martin, Paul D R Johnson, Maryanda E Joboin, Celene McMullan, Roger HC Gregory, Kaye Bolis, Katie Cunningham, Fiona L Wilson, Diana Quinn and Anna-Maree Kelly, on behalf of the Victorian Quality Council’s Hand Hygiene Study Group and Hand Hygiene Statewide Roll-out Group

Multimodal programs to change hand hygiene (HH) culture have achieved significant sustained improvements in HH compliance by health care workers and reductions in rates of infection with methicillin-resistant Staphylococcus aureus (MRSA) and other nosocomial pathogens in individual institutions in Australia and elsewhere. Although the World Health Organization and other bodies have advocated large-scale roll-outs of such programs, there are currently no data to support the efficacy of such system-wide initiatives or to describe an optimal approach. In fact, some researchers have expressed doubts about whether such programs can be effectively introduced across a range of institutions or as a statewide policy initiative, owing to their perceived dependence on enthusiastic individual champions and the complexity of developing a generic culture-change template that is suitable for multiple disparate institutions.

After the success of a recent single-site HH culture-change program (HHCCP, we assessed the efficacy of a similar, but more focused, centrally coordinated 2-year pilot program in six Victorian health care

ABSTRACT

Objective: To assess the efficacy of a multimodal, centrally coordinated, multisite hand hygiene culture-change program (HHCCP) for reducing rates of methicillin-resistant Staphylococcus aureus (MRSA) bacteremia and disease in Victorian hospitals.

Design, participants and setting: A pilot HHCCP was conducted over a 24-month period (October 2004 to September 2006) in six Victorian health care institutions (4 urban, 2 rural; total beds, 2,379). Subsequently, we assessed the efficacy of an identical program implemented throughout Victorian public hospitals over a 12-month period (beginning between March 2006 and July 2006).

Main outcome measures: Rates of hand hygiene (HH) compliance; rates of MRSA disease (patients with bacteremia and number of clinical isolates per 100 patient-days [PD]).

Results: Mean HH compliance improved significantly at all pilot program sites, from 21% (95% CI, 20%-22%) at baseline to 49% (95% CI, 47%-49%) at 12 months and 47% (95% CI, 46%-48% range, 31%-75%) at 24 months. Mean baseline rates for the number of patients with MRSA bacteremia and the number of clinical MRSA isolates were 0.05/100 PD per month (range, 0.00-0.13) and 1.39/100 PD per month (range, 0.16-2.39), respectively. These were significantly reduced after 24 months to 0.02/100 PD per month for bacteremia (P = 0.035 for trend, 66 fewer patients with bacteremia) and 0.73/100 PD per month for MRSA isolates (P = 0.003; 116 fewer isolates). Similar findings were noted: 12 months after the statewide roll-out, with an increase in mean HH compliance (from 20% to 53%; P < 0.001) and reductions in the rates of MRSA isolates (P = 0.043) and bacteremia (P = 0.09).

Conclusions: Pilot and subsequent statewide implementation of a multimodal HHCCP was effective in significantly improving HH compliance and reducing rates of MRSA infection.

MJA 2008; 188: 633–640
Key lessons learned

1. Validation of HH compliance assessors crucial
   - “Victorian” HH compliance tool rather complex

2. Use of MRSA isolate data
   - Large numbers = statistical power, but...
   - Data easily contaminated with screening results in some sites
   - Difficult to validate centrally

3. MRSA bacteraemia
   - Robust - easily explained to politicians and less open to criticism
   - A good outcome measure for HH (impact 60-70%??)

4. National roll-out
   - Need simple HH compliance audit tool
   - Allows national and hopefully international benchmarking
   - ? Prepare for open public disclosure
Use DeBug™ before and after hospital visits to help stop infections.
Poor hygiene at hospitals

FIONA HUDSON

DOCTORS and nurses at some of the state’s top hospitals routinely fail to clean their hands, health department audits reveal.

Dozens of hospitals across Victoria didn’t meet hand hygiene standards, data obtained by the Sunday Herald Sun under Freedom of Information laws shows.

Department of Human Services monitoring revealed staff at the Royal Women’s Hospital performed only 20 per cent of “hand hygiene opportunities” correctly.

Audits for the 12 months to January showed Melbourne Health recorded 22 per cent compliance and Austin Health 35 per cent.

Others to record less than 50 per cent included Mercy Health, Eastern Health, Western Health and the Peter MacCallum Cancer Centre.

The State Government launched a crackdown on infection control in 2008. It aimed at reducing the number of people catching deadly superbugs.

Hospitals were expected to achieve an overall mean hand hygiene compliance of 55 per cent by next month.

But the new figures indicated the multi-million-dollar project to install alcohol hand rubs at or near the end of each patient bed and an accompanying education blitz had failed to significantly change staff behaviour.

Staff are supposed to clean their hands before contact with each patient, before any invasive procedures, after any contact with a patient’s skin or after touching a patient’s chart or bedpan.

Poor hand washing is known to be a major factor in the spread of antibiotic resistant pathogens in hospitals.

The most diligent handwashers worked at Rochester & Elmore District Health, which had 89 per cent compliance.

Department of Human Services Quality Branch director Alison McMillan said the audits were important because there was a strong link between how frequently staff washed their hands and the rate of MRSA infections.

Ms McMillan said compliance rates as low as 20 per cent were “outrageous”.

“We would look to the organisations to work with their staff to improve that,” she said.

<table>
<thead>
<tr>
<th>WORST OFFENDERS</th>
<th>Health service</th>
<th>Hand wash rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royal Women’s Hospital</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Melbourne Health</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>Gippsland Southern Health Service</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Stawell Regional Health</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Echuca Regional Health</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>Robinvale District Health Service</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Austin Health</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>Southern Health</td>
<td>37%</td>
<td></td>
</tr>
<tr>
<td>Barwon Health, Alpine Health</td>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>Peninsula Health</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Mercy Health, Western Health</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>Peter MacCallum Cancer Centre, Eastern Health</td>
<td>42%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Department of Human Services
Hand Rub Hub
Open discussion about HH and HAIs in the community

• Year 9 high school literacy exam
Open discussion about HH and HAI's in the community

- Year 9 high school literacy exam
WORLD ALLIANCE for PATIENT SAFETY

Clean Care is Safer Care

Hand Hygiene Australia
5 Moments for HAND HYGIENE

1. Before touching a patient
2. Before a procedure
3. After a procedure or body fluid exposure risk
4. After touching a patient
5. After touching a patient’s surroundings
National Hand Hygiene Initiative

• Public hospitals - all States and Territories

• Two key outcome measures:
  – HH compliance – 3 audits/year
  – Monthly S. aureus bacteraemia rates

• Private hospitals now joining program

• Close collaboration with New Zealand
Hand Hygiene:

“Before and after every patient contact”

Patient contact =
• touching the patient,
• their immediate surroundings or
• performing any procedure
HHA-WHO “5 Moments”

1. Before touching the patient
   (and their immediate surroundings)

2. Before a procedure

3. After a procedure or Body Fluid Exposure Risk

4. After touching the patient
   (and their immediate surroundings)

5. After touching the immediate surroundings when you have not touched the patient
Standardisation & validation of HH Compliance assessors crucial

- Inter-rater reliability – “gold” standard
- Intra-rater reliability
- Provides valid comparable data
HH Compliance Auditing
Standardisation & validation of assessors

• Crucial for national reporting
  – Cannot audit unless validated

• Two-day training workshop

Two components:
• Theoretical validation
  – Written test - need >90%
  – DVD-video Moments test - >90% consistency

• Practical validation
  – Observe ≥100 Moments on wards - >90% consistency
Standardised HH compliance data

No. options:
- Manual entry
- Direct on-line entry
- Hand-held data recording devices
  - Direct data entry
Hand Hygiene observation - Data collection form.

**Health Service:**

**Ward:**

**Date:** __ / __ / ______

**Observer:**

**Session No.:**

**Start Time:**

**Finish Time:**

**Duration of Session:** ___ mins

**Database Record No.:**

---

**FIVE MOMENTS FOR HAND HYGIENE:**
1. Before patient contact
2. Before a procedure
3. After a procedure or body fluid exposure risk
4. After patient contact
5. After contact with patient surroundings

**Notes**

---

<table>
<thead>
<tr>
<th>Hcw</th>
<th>Moment</th>
<th>Action</th>
<th>Gloves</th>
<th>Hcw</th>
<th>Moment</th>
<th>Action</th>
<th>Gloves</th>
<th>Hcw</th>
<th>Moment</th>
<th>Action</th>
<th>Gloves</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hand Hygiene Report  
10 East  
16/06/2008 - 16/06/2008  
Total Compliance

<table>
<thead>
<tr>
<th>Total Performed</th>
<th>Total Moments</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>50</td>
<td>72.00%</td>
</tr>
</tbody>
</table>

Total By Moment

<table>
<thead>
<tr>
<th>Moment</th>
<th>Performed</th>
<th>Total</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Before Patient Contact</td>
<td>6</td>
<td>10</td>
<td>60.00%</td>
</tr>
<tr>
<td>2 - Before a Procedure</td>
<td>4</td>
<td>6</td>
<td>66.67%</td>
</tr>
<tr>
<td>3 - After a Procedure or Body Fluid</td>
<td>5</td>
<td>8</td>
<td>62.50%</td>
</tr>
<tr>
<td>4 - After Patient Contact</td>
<td>8</td>
<td>10</td>
<td>80.00%</td>
</tr>
<tr>
<td>5 - After Contact With Patient Surroundings</td>
<td>13</td>
<td>16</td>
<td>81.25%</td>
</tr>
</tbody>
</table>

Compliance By HCW

<table>
<thead>
<tr>
<th>HCW</th>
<th>Total Performed</th>
<th>Total Moments</th>
<th>HCW Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA</td>
<td>2</td>
<td>4</td>
<td>50.00%</td>
</tr>
<tr>
<td>RN</td>
<td>34</td>
<td>46</td>
<td>73.91%</td>
</tr>
</tbody>
</table>

Total Glove Compliance

<table>
<thead>
<tr>
<th>Glove Use</th>
<th>Performed</th>
<th>Moments</th>
<th>Glove Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>4</td>
<td>5</td>
<td>80.00%</td>
</tr>
<tr>
<td>On</td>
<td>1</td>
<td>4</td>
<td>25.00%</td>
</tr>
</tbody>
</table>

Total Product Usage

<table>
<thead>
<tr>
<th>Description</th>
<th>HH Performed</th>
<th>Total Performed</th>
<th>Percentage Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Based Hand Rub Rub</td>
<td>34</td>
<td>34</td>
<td>68.00%</td>
</tr>
<tr>
<td>Hand Hygiene not performed</td>
<td>Missed</td>
<td>14</td>
<td>28.00%</td>
</tr>
<tr>
<td>Wash</td>
<td>Wash</td>
<td>2</td>
<td>4.00%</td>
</tr>
</tbody>
</table>
Recent Victorian HH Compliance using 5 Moments
(Feb/Mar 09)
National Hand Hygiene Compliance rates  Audit periods 1, 2 and 3 - 2009
Hand Hygiene Australia

<table>
<thead>
<tr>
<th>Period</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45.3%</td>
<td>57.4%</td>
<td>56.9%</td>
<td>52.3%</td>
<td>35.5%</td>
<td>70.5%</td>
<td>47.0%</td>
<td>63.6%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>50.1%</td>
<td>57.5%</td>
<td>59.2%</td>
<td>60.2%</td>
<td>53.2%</td>
<td>52.9%</td>
<td>70.8%</td>
<td>51.3%</td>
<td>63.5%</td>
</tr>
<tr>
<td>3</td>
<td>61.4%</td>
<td>61.0%</td>
<td>51.1%</td>
<td>41.6%</td>
<td>53.8%</td>
<td>58.5%</td>
<td>69.5%</td>
<td>57.8%</td>
<td>61.8%</td>
</tr>
</tbody>
</table>
National Hand Hygiene Compliance Rates by Moment - 290 Public and Private Facilities
Period 3 2009

<table>
<thead>
<tr>
<th>Moment 1 (n=35900)</th>
<th>Moment 2 (n=8664)</th>
<th>Moment 3 (n=12478)</th>
<th>Moment 4 (n=36925)</th>
<th>Moment 5 (n=32586)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series 1</td>
<td>56.2%</td>
<td>58.5%</td>
<td>72.8%</td>
<td>71.5%</td>
</tr>
</tbody>
</table>

Moment (n=number of Moments)
National Hand Hygiene Compliance rates by Healthcare Worker
Audit periods 1, 2 & 3 - 2009
Hand Hygiene Australia

<table>
<thead>
<tr>
<th>Healthcare worker category</th>
<th>Compliance Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period 1</td>
<td>Period 2</td>
</tr>
<tr>
<td>Allied Health</td>
<td>59%</td>
</tr>
<tr>
<td>Blood Nurse</td>
<td>66%</td>
</tr>
<tr>
<td>Medical Staff</td>
<td>51%</td>
</tr>
<tr>
<td>Registered Nurse</td>
<td>68%</td>
</tr>
<tr>
<td>Other</td>
<td>49%</td>
</tr>
<tr>
<td>Patient Services Attendant</td>
<td>53%</td>
</tr>
<tr>
<td>Student Allied Health</td>
<td>57%</td>
</tr>
<tr>
<td>Student Medical staff</td>
<td>70%</td>
</tr>
<tr>
<td>Student Nurse</td>
<td>65%</td>
</tr>
</tbody>
</table>
A National System for Recording *Staphylococcus aureus* bacteraemia (SAB)
Is associated with the presence of an indwelling medical device

Occurs within 30 days of a medical procedure where the BSI is related to the surgical site

An invasive instrumentation or incision related to the BSI was performed within 48 hours

Associated with neutropenia (<1 x 10⁹/L) contributed to by cytotoxic therapy
SAB

MRSA

MSSA

<48 hs

>48 hs

Hospital-associated SAB

Is associated with the presence of an indwelling medical device

Occurs within 30 days of a medical procedure where the BSI is related to the surgical site

An invasive instrumentation or incision related to the BSI was performed within 48 hours

Associated with neutropenia (<1 x 10^9/L) contributed to by cytotoxic therapy
Is associated with the presence of an indwelling medical device

- Occurs within 30 days of a medical procedure where the BSI is related to the surgical site
- An invasive instrumentation or incision related to the BSI was performed within 48 hours
- Associated with neutropenia (<1 x 10^9/L) contributed to by cytotoxic therapy

SAB

MRSA

MSSA

<48 hs

>48 hs

Community-onset SAB
Is associated with the presence of an indwelling medical device

- Occurs within 30 days of a medical procedure where the BSI is related to the surgical site
- An invasive instrumentation or incision related to the BSI was performed within 48 hours
- Associated with neutropenia (<1 x 10^9/L) contributed to by cytotoxic therapy
SAB

MRSA

≤48 hs

Community-associated SAB

MSSA

>48 hs

Healthcare-associated SAB
Initial results
Australian SAB data

• Data from 5 of 8 States/territories
  – Remainder to follow
  – Some politics

• 24 mths retrospective data to follow
• Being viewed as the “blue-print” for a national system of nosocomial infection surveillance
• Federal to State health funding to be linked to SAB rates
Hospital associated (> 48 hours) SAB bloodstream infections per 10,000 OBDs
Jan - Mar 2009

- State A (n=1)
- State B (n=8)
- State C (n=21)
- State D (n=40)
- State E*
- State F*
- State G*
- State H*
- National

* No data

www.hha.org.au
Hospital associated (> 48 hours) MSSA and MRSA bloodstream infections per 10,000 OBDs
Jan - Mar 2009

State A (n=1)  State B (n=8)  State C (n=21)  State D (n=40)  State E*  State F*  State G*  State H*  National

* No data

- Hospital associated (>48 hours) MSSA bloodstream infections per 10,000 OBDs
- Hospital associated (>48 hours) MRSA bloodstream infections per 10,000 OBDs
Staphylococcus aureus bacteremia rate per 10,000 Occupied Bed Days

<table>
<thead>
<tr>
<th>State / Territory</th>
<th>Rate / 10,000 OBDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (2009)</td>
<td>1.5</td>
</tr>
<tr>
<td>B (Jan-Oct 2009)</td>
<td>1.5</td>
</tr>
<tr>
<td>C (Jan-Sep 2009)</td>
<td>1.5</td>
</tr>
<tr>
<td>D (Jan-Jun 2009)</td>
<td>2.5</td>
</tr>
<tr>
<td>E (2008-2009)</td>
<td>1.0</td>
</tr>
</tbody>
</table>
Potential problems with SAB reporting

• Because of funding implications
  – now highly political
  – Accurate lab data vs ICD-10 data

• If lab data, which denominator?
  – Occupied bed days vs patient discharges
  – Some States currently vary

• Silly details
  – Does a pregnant woman = 1 or 2 admissions?

• System of national SAB data progressing
  – but some delays in nationwide definitions
  – Sense of political anxiety in some States
Politics and the future for HH
Robust reporting system

- Important for long-term sustainability
- Needs to be easily understood
  - HCWs, patients
  - Politicians and voters
  - CEOs
- Eventually needs to become embedded in the hospital’s quality reporting (funding) matrix
Correlation between HH compliance and disease reduction

![Graph showing the correlation between HH compliance and disease reduction. The graph indicates a negative correlation, with nosocomial disease reduction decreasing as HH compliance increases.]
Correlation between HH compliance and disease reduction
Correlation between HH compliance and disease reduction

HH Power-band

Nosocomial disease reduction

HH compliance
<table>
<thead>
<tr>
<th>Hand Hygiene Compliance Rate - Overall</th>
<th>Compliance Rate</th>
<th>Stars</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall HH Compliance between &lt; 30%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Overall HH Compliance between = 36-40%</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Overall HH Compliance between = 46-50%</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Overall HH Compliance between = 56-60%</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Overall HH Compliance between = 66-70%</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Overall HH Compliance between &gt; 75%</td>
<td>5</td>
</tr>
</tbody>
</table>

- Avoids focus on exact % HH compliance
- Consistent with “Power-band” disease reduction
- Simple
<table>
<thead>
<tr>
<th></th>
<th>Hand Hygiene Compliance rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin Hospital</td>
<td>★★★★★★</td>
</tr>
<tr>
<td>Victoria</td>
<td>★★★★★☆</td>
</tr>
<tr>
<td>Australia</td>
<td>★★★★</td>
</tr>
</tbody>
</table>

Sample only
Based on current Victorian report

<table>
<thead>
<tr>
<th>HOSPITAL</th>
<th>COMPLIANCE RATE</th>
<th>95% CI</th>
<th>STAR RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>District Hospital</td>
<td>75%</td>
<td>66-82%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Regional Health</td>
<td>75%</td>
<td>66-82%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Memorial Hospital</td>
<td>74%</td>
<td>67-79%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Regional Health Service</td>
<td>71%</td>
<td>59-81%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health</td>
<td>70%</td>
<td>68-72%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health Service</td>
<td>67%</td>
<td>58-76%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health</td>
<td>66%</td>
<td>64-68%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health</td>
<td>66%</td>
<td>63-69%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health</td>
<td>65%</td>
<td>63-67%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health Service</td>
<td>64%</td>
<td>61-68%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Base Hospital</td>
<td>61%</td>
<td>51-69%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health Service</td>
<td>57%</td>
<td>43-69%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health Service</td>
<td>55%</td>
<td>48-61%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health</td>
<td>54%</td>
<td>52-56%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Regional Health Service</td>
<td>47%</td>
<td>48-61%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health Service</td>
<td>45%</td>
<td>35-55%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Health</td>
<td>44%</td>
<td>42-45%</td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td><strong>State Average Hand Hygiene Compliance</strong></td>
<td><strong>70%</strong></td>
<td></td>
<td>⭐⭐⭐⭐⭐⭐</td>
</tr>
</tbody>
</table>
SUMMARY
Impact of Hand Hygiene improvement on health care-associated infection

• Clear data from numerous sites that improved HH reduces HAIs associated with *S. aureus*
  – Issue less clear for other pathogens (not VRE or *C. difficile*)

• HH programs cost-effective
  – $2 saved for each $1 spent

• SAB a robust outcome measure for HH effectiveness

• Establishment and embedding of national HH programs
  – Time-consuming and laced with politics
  – SAB – a politically useful HH outcome measure

• Establishment of national system for SAB data
  – A potential “blue-print” for other pathogens
Australasia - S.E. Asia Hand Hygiene Collaborative
Inaugural Workshop - Sponsored by Hand Hygiene Australia
Novotel Rockford, Palm Cove, Queensland
Friday 18 to Saturday 19 June 2010

We would like to invite you to attend the Australasia - S.E. Asia Hand Hygiene Collaborative (ASEAHHC) Inaugural Workshop to be held at the Novotel Rockford, Palm Cove, Queensland from Friday 18 to Saturday 19 June 2010.

The ASEAHHC Inaugural Workshop presents a unique opportunity to be informed about the latest developments with hand hygiene and network with other key stakeholders from this region. The workshop includes a number of key international speakers including:

**Didier Pittet, MD, MS**
Professor of Medicine, Director of the Infection Control Programme, University of Geneva Hospitals and Faculty of Medicine, Switzerland. Lead, WHO First Global Patient Safety Challenge “Clean Care is Safer Care”

**Andreas Voss, MD, PhD**
Professor of Infection Control, Radboud University, Medical Centre and Canisius-Wilhelmina Hospital, Nijmegen, The Netherlands

**Andreas F. Widmer, MD, MS**
Division of Infectious Diseases & Hospital Epidemiology Head, University Hospital Basel, Basel, Switzerland

**Other international presenters include:**
Sally Roberts, Hand Hygiene New Zealand
Dale Fisher, National University Hospital, Singapore
Nordiah Jali, National University of Malaysia, Malaysia
Michael Dokup, Mt Hagen Hospital, Papua New Guinea
Australasia - S.E. Asia Hand Hygiene Collaborative
Inaugural Workshop - Sponsored by Hand Hygiene Australia
Novotel Rockford, Palm Cove, Queensland
Friday 18 to Saturday 19 June 2010

We would like to invite you to attend the Australasia - S.E. Asia Hand Hygiene Collaborative (ASEAHHC) Inaugural Workshop to be held at the Novotel Rockford, Palm Cove, Queensland from Friday 18 to Saturday 19 June 2010.

The ASEAHHC Inaugural Workshop presents a unique opportunity to be informed about the latest developments with hand hygiene and network with other key stakeholders from this region. The workshop includes a number of key international speakers including:

Didier Pittet, MD, MS
Professor of Medicine, Director of the Infection Control Programme,
University of Geneva Hospitals and Faculty of Medicine, Switzerland.
Lead, WHO First Global Patient Safety Challenge “Clean Care is Safer Care”

Andreas Voss, MD, PhD
Professor of Infection Control, Radboud University,
Medical Centre and Canisius-Wilhelmina Hospital, Nijmegen, The Netherlands

Andreas F. Widmer, MD, MS
Division of Infectious Diseases & Hospital Epidemiology Head,
University Hospital Basel, Basel, Switzerland

Other international presenters include:
Sally Roberts, Hand Hygiene New Zealand
Dale Fisher, National University Hospital, Singapore
Nordiah Jalil, National University of Malaysia, Malaysia
Michael Dokup, Mt Hagen Hospital, Papua New Guinea

For more information:
Phil Russo
Hand Hygiene Australia
National Project Manager
philip.russo@austin.org.au
www.hha.org.au