Performance Feedback using statistical process and output control charts to reduce HAIs

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Surveillance

This process includes the forced completion of boring forms (that are difficult to find and really easy to lose), with banal details based on poor definitions, and it interferes with the effective management of patients and you never get to see the data.
Complicated vs. complex

- Assembling a meccano model of the Eiffel tower
- Bringing up a child

Thanks to Abs Bal for this
### Solar powered speed limit signs

<table>
<thead>
<tr>
<th></th>
<th>If you exceed 30mph (Hand hygiene compliance &lt; 80%)</th>
<th>If you are within the speed limit (Hand hygiene compliance &gt; 90%)</th>
<th>Infection prevention and Control paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Troon</strong></td>
<td>Continuous illuminated 30mph sign</td>
<td>zilch</td>
<td>American/Swiss</td>
</tr>
<tr>
<td><strong>Crosshouse</strong></td>
<td>Gives your speed and an unhappy face</td>
<td>Gives your speed and a happy face</td>
<td>Scottish</td>
</tr>
<tr>
<td><strong>Portugal</strong></td>
<td>Continuous illuminated 30mph sign AND switches traffic lights to red in the village</td>
<td>zilch</td>
<td>Unannounced visit from the HEI</td>
</tr>
</tbody>
</table>

Thanks to Frances Lafferty for the Portuguese angle
American/Swiss Paradigm

American Speaker at the Harrowgate HAI conference - an aside -

‘I asked Didier Pittet what was the highest compliance rate observers external to the clinical areas had observed and he said 86%’

This paradigm generates precise but not necessarily accurate data on hand hygiene compliance and excludes the ambition of 100% compliance
The Scottish Paradigm

• Routine observations of staff by staff in the clinical area
• Initially involves Hand Hygiene coordinator and Hand Hygiene Trainer
• Objective to have weekly Hand Hygiene audits performed by all grades of staff with HHPF
• The Hand hygiene standard must be known and internalised by the local observer
• This is routine clinical activity, not external observation
• The realistic target is 100% compliance or zero tolerance to non-compliance
Handwashing Performance Feedback
Statistical Process Control (SPC)

14. Tibbals J Teaching hospital staff to handwash
Medical Journal of Australia 1995; 164:395-398

Handwashing rates (%)

<table>
<thead>
<tr>
<th>Unobtrusive observation</th>
<th>Overt observation</th>
<th>Feedback observation</th>
<th>No observation</th>
<th>Unobtrusive observation</th>
</tr>
</thead>
</table>

Consecutive weeks

Before contact | After contact | Before and after contact

Handwashing rates of 61 medical officers in relation to 939 patient contacts.

Patients' Journey - Missing Data,
SIRN conference 23-04-10 Perth
Doctors are a problem

Nineteen medical officers estimated their own handwashing rate before patient contact after the first phase of covert observation. Their mean estimate was 66% (range, 30%-95%)

Several commented that other medical officer washed their hands infrequently.

14 of these 19 subjects subsequently participated in the remaining phases of the program.

Among this cohort, the mean self-estimated handwashing rate was 73% (range 50%-95%), compared with the covertly observed rate for this cohort of 8.6% before and 10.8% after patient contact with an individual mean rate of 10% (range, 0-33%).

Doctors are a problem

14. Tibbals  J Teaching hospital staff to handwash
Medical Journal of Australia 1995; 164:395-398
Semmelweis’s story - handwashing saved lives

“The birthday of my doctrine fell in the second half of May of the year 1847”

Ignatz Philipp Semmelweis - born 1st July 1818 in Buda, Hungary, the son of a grocer. He studied law, medicine and surgery, specialising in forensic medicine, pathological anatomy and obstetrics. He then obtained a post in February 1846 at maternity clinic of the Vienna General Hospital - the world’s largest birthing centre at that time, with 3000-4000 births per year.

Monthly mortality rates from puerperal fever
(caused by Group A beta-haemolytic streptococcus - G.A.S.) were up to 20%, averaging 15%.
In spring 1847 his friend Professor Kolletschka died from G.A.S. septicaemia after a clumsy medical student cut him with a contaminated scalpel at a post mortem.
By 1848 the mortality rates were 1.3% and he left two years later to become medical director in Obstetrics in Pest, then in 1855 Professor in Obstetrics for Budapest.He published his findings from Vienna in 1861.
In July 1865 his wife and some physician friends took him to Vienna for investigation of a possible mental illness. He died of septicaemia (probably G.A.S.) in the Lower Austrian State Lunatic Asylum on August 13 at the age of 47 years.
Clinical Hand Hygiene standard – a new standard for ALL Health Care Workers who have clinical contacts with patients

Decontamination of socially clean hands with alcohol gel takes place between clinical contacts with patients and between wards

Please see Infection Control Manual (ICM) for full guidance on Hand washing

What is a clinical contact?

Touching a patient’s skin (skin-skin contact) or an invasive device, like an intravenous cannula or urinary catheter (skin-plastic contact)

Using the alcohol gel before the first clinical contact is crucial – make a clean start – the patient will appreciate this.

For an extended episode of care decontamination of clean hands with alcohol gel takes place

• before the start of care (if not already done after a previous clinical contact)
• before and after touching any invasive device
• at the end of care

Why alcohol gel?

• After clinical contact, hands may become contaminated with transients – e.g. MRSA, Klebsiella, Clostridium difficile, vancomycin-resistant enterococci (VRE)
• Soap and water removes ~99% of transients. Alcohol gel KILLS >99.9% of transients.
• It is more convenient than washing and drying clean hands at a sink and saves time
• The busier the ward, the less soap and water handwashing takes place.
• Alcohol gel dispensers are widely available.
• It seems to work. In our trust we could save up to £4.5million annually (30% of £14m).

Won’t it dry my hands?

• Alcohol gel is less likely to do this than liquid alcohol preparations like Hibisol™ (the manufacturer recommends washing hands in soap and water after 5 uses of the gel, or when hands feel ‘sticky’).
• The Trust will install hand moisturising cream in all clinical areas.
• If you do have problems with your hands please go to Occupational Health.
• To minimise the risk of developing latex allergy, remember to wash your hands in soap and water to physically remove any latex particles after removing gloves.

How can we check the standard of Hand Hygiene in our clinical area?

• Environmental audits
• Hand Hygiene Performance Feedback – All grades of HCWs (yes, even consultants) in a clinical area observe each other’s compliance to the standard using easily completed Teleforms.

Clinical Effectiveness process the data and feed back the overall compliance rate with input from the Infection Control Team. It works.

1. ‘Hand contamination of personnel as a mechanism of cross-infection in nosocomial infections with antibiotic-resistant E. coli and Klebsiella’ Anti Agents and Chemother 1967: 97-100
2. ‘Handwashing and hand disinfection’ Journal of Hospital Infection 1986; 8: pp5-23
4. ‘Electrostatically charged, overtone and decreased handwashing’ Journal of Hospital Infection June 1990
5. ‘Nursing staff workload as a determinant of MRSA spread in an adult intensive care unit’ Journal of Hospital Infection 1999; 43: 108-113
6. ‘Effectiveness of a hospital-wide programme to improve compliance with hand hygiene’ Lancet 2000; 356:1218-22 Also Editorial
7. ‘Bacteraemia tied to overcrowding, overtime and decreased handwashing’ Hospital Infection Control June 1980
8. ‘Nursing staff workload as a determinant of MRSA spread in an adult intensive care unit’ Journal of Hospital Infection 1999; 43: 108-113
9. ‘Effectiveness of a hospital-wide programme to improve compliance with hand hygiene’ Lancet 2000; 356:1218-22 Also Editorial
12. The socio-economic burden of Hospital Acquired infection PHLS 1999
Hand washing performance feedback (SPC)

Performance feedback of hand hygiene, using alcohol gel as the skin decontaminant, reduces the number of inpatients newly affected by MRSA and antibiotic costs.
A. MacDonald*, F. Dinah, D. MacKenzie, A. Wilson

Rates before/after a clinical contact were similar 40%/80%
Surgical Wound Infection Rate over by Audit Period

Source: Jacqui Reilly, Lanarkshire NHS Trust
J Advanced Nursing 2002 vol 38 (6)
This decrease occurred before any changes in practise
e.g. stopping pre–op shaving

Thanks to Billy Cullinane, Jacky Williams NHS A&A and Jacqui Reilly at HPS
Patients newly affected by MRSA identified in Station 1 (Vascular Surgery) from 1st Jan 2000 to March 2006

Robert Gray Infection Control Nurse Specialist Advisor

Patients' Journey - Missing Data,
SIRN conference 23-04-10 Perth
Thanks to Bob Wilson, Infection Control Manager and Chris Paterson and Lorraine Pollock ICNs for this and subsequent slides.
SOC

**Clostridium difficile**

**Clostridium difficile in STATION 9 at Time of Identification**

**Clostridium difficile Probably Acquired in STATION 9**

**Comment**
There were no acquisitions of C.diff in February for the 7th consecutive month.

This is the longest period without acquisition since records began in Apr 06.

For a Gastro ward this is a remarkable and commendable achievement.

Congratulations.
Comment
There were no acquisitions of C.diff in March for the 17th consecutive month

This is a remarkable achievement

Congratulations
First Isolates of MRSA in STATION 10 When First Identified

First Isolates of MRSA Probably Acquired in STATION 10

Comment
There were no acquisitions of MRSA in December for the 9th consecutive month

This is the longest period without acquisition since records began in Apr 06

Congratulations
**Comment**

There were no acquisitions of C.diff in February for the 2nd consecutive month.

The ward has experienced recent Norovirus outbreaks, therefore this is a remarkable achievement.

Congratulations.
Comment

There were no acquisitions of C.diff in March for the 10th consecutive month

This is the longest period without acquisition since records began in Apr 08

Congratulations
First Isolates of MRSA in STATION 12 When First Identified

First Isolates of MRSA Probably Acquired in STATION 12

Comment
There was 1 acquisition of MRSA in March
First Isolates of MRSA in STATION 5 (CCU) When First Identified

First Isolates of MRSA Probably Acquired in STATION 5 (CCU)

Comment
There were no acquisitions of MRSA in March for the 14th consecutive month

This is the longest period without acquisition since records began in Apr 09

Congratulations
(v) Deaths associated with medical or dental care

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(h) any death occurring as a result directly or indirectly of an infection acquired while under medical or dental care while on NHS premises, including hospitals, GP’s surgeries, health centres and dental surgeries.
The ultimate statistical output control –
Performance Feedback of deaths with or of an HAI
Minimise avoidable morbidity and mortality