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Hand washing basins and facilities – latest evidence

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I have no disclosures/conflicts of interest related to this talk

Introduction



History of handwashing

- **Mid 19th century:** First recognized by two pioneers of hand hygiene, Ignaz Semmelweis and Florence Nightingale.
- **1980s:** Foodborne outbreaks and healthcare-associated infections led the United States Centers for Disease Control and Prevention to more actively promote hand hygiene as an important way to prevent the spread of infection.
- **2009:** Outbreak of swine flu led to increased awareness in many countries of the importance of washing hands with soap to protect oneself from such infectious diseases.
- **>2009:** Prof Didier Pittet - observation studies in Geneva by Pittet's team showed a low compliance with basic hand hygiene practices. Time constraint was identified as the major determinant for poor compliance. Introduction of alcohol-based hand rub at the point of care to replace handwashing at the sink ("system change")

What we are guided to do

International Health Facility Guidelines Part B: Version 5/2017

As adequate hand hygiene is a major factor in preventing transmission of infections, it is essential that provision of sufficient and appropriate hand hygiene facilities are considered in the early design stage.

The **World Health Organisation** hand hygiene recommendations for health care workers include:

- Use of alcohol based hand rubs (ABHR) as the preferred means of routine hand cleaning if hands are not visibly soiled
- **Washing hands with soap and water if hands are visibly soiled**, if staff have been in contact with spore forming pathogens or when gloves have not been used.

Handwash basins should be provided in rooms where procedures are likely to occur, including inpatient rooms, ICU bed bays, treatment and procedure rooms. The type of handwash basins in clinical areas such as these should be ideally provided with sensor taps, prevent splashing, and be of sufficient size and height above floor level to permit the washing of forearms.

What we know now

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https://www.statnews.com/2016/10/25/hospital-sir

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How hospital sinks became ...

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HOSPITALS

Hospitals installed more sinks to stop infections. The sinks can make the problem worse

By HELEN BRANSWELL @HelenBranswell / OCTOBER 25, 2016

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from sinks to narrows.

But Kallen said more experiments are underway because of the number of reports that put sinks squarely at the heart of hospital outbreaks.

Gardam has firsthand experience with an outbreak caused by a sink. It was a bad one. Three dozen patients in intensive care contracted a drug-resistance bacteria; an investigation after the fact said five died because of the infection.

“Once you have the biofilms in there, short of ripping the sinks and the piping out, it’s impossible to get rid of.”

DR. ALEX KALLEN, CDC

Figuring out how the patients were getting infected took sleuthing, but eventually suspicion fell on some sinks in the ICU. They had gooseneck faucets that directed

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Evidence – 2014

The sink as a correctable source of extended-spectrum b-lactamase contamination for patients in the intensive care unit

I. Wolf ^{a, *}, P.W.M. Bergervoet ^a, F.W. Sebens ^a, H.L.A. van den Oever ^b, P.H.M. Savelkoul ^c, W.C. van der Zwet ^a

S U M M A R Y

- Between December 2010 and April 2012, intensive care unit (ICU) patients in our hospital were infrequently **colonized with extended-spectrum b-lactamase-positive bacteria (ESBLs)**.
- We hypothesized that these ESBLs originated from patients' room sinks, and this was **prospectively investigated** by weekly culturing of patients and sinks during a 20-week period.
- **ESBLs were isolated from all 13 sinks.**
- **Four patients became colonized** with ESBLs that were **genetically identical** to ESBLs that had previously been isolated from the sink.
- One of these patients died of pneumonia caused by the ESBL.
- Transmission from sinks to patients was stopped by integrating self-disinfecting siphons to all sinks on the ICU.

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Evidence – 2016

Continued transmission of Pseudomonas aeruginosa from a wash hand basin tap in a critical care unit

M.I. Garvey*, C.W. Bradley, J. Tracey, B. Oppenheim

University Hospitals Birmingham NHS Foundation Trust, Queen Elizabeth Hospital Birmingham, Edgbaston, Birmingham, UK

S U M M A R Y

- **Pseudomonas aeruginosa** is an important nosocomial pathogen, colonizing hospital water supplies including taps and sinks.
- We report a **cluster of P. aeruginosa acquisitions** during a period of five months from tap water to patients occupying the same burns single room in a critical care unit.
- Pseudomonas aeruginosa cultured from **clinical isolates from four different patients was indistinguishable from water strains** by pulsed-field gel electrophoresis.
- Water outlets in critical care may be a source of P. aeruginosa despite following the national guidance, and updated guidance and improved control measures are needed to reduce the risks of transmission to patients.

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Evidence – 2017

Reduced rate of intensive care unit acquired gram-negative bacilli after removal of sinks and introduction of 'water-free' patient care (Netherlands)

Joost Hopman^{1†}, Alma Tostmann^{1†}, Heiman Wertheim¹, Maria Bos¹, Eva Kolwijck¹, Reinier Akkermans³, Patrick Sturm^{1,4}, Andreas Voss^{1,2}, Peter Pickkers⁵ and Hans vd Hoeven⁵

Aim of study: to evaluate **the effect of removal of sinks from the Intensive Care Unit (ICU)** patient rooms and the introduction of 'water-free' patient care on gram-negative bacilli colonization rates.

Method: **2-year pre/post quasi-experimental study** that compared monthly gram-negative bacilli colonization rates pre- and post-intervention. Five ICUs of a tertiary care medical center were included. Participants were all patients of 18 years and older admitted to our ICUs for at least 48 h who also received selective digestive tract decontamination during the twelve month pre-intervention or the twelve month post-intervention period.

Results: The **overall GNB colonization rate dropped from 26.3 to 21.6 GNB/1000 ICU admission days** (colonization rate ratio 0.82; 95%CI 0.67–0.99; P = 0.02). The reduction in GNB colonization rate became more pronounced in patients with a longer ICU-Length of Stay (LOS): from a 1.22-fold reduction (≥ 2 days), to a 1.6-fold (≥ 5 days; P = 0.002), 2.5-fold (for ≥ 10 days; P < 0.001) to a 3.6-fold (≥ 14 days; P < 0.001) reduction.

Evidence – 2018

Characterizations of handwashing sink activities in a single hospital medical intensive care unit (USA)

M. Grabowski ^a, J.M. Lobo ^a, B. Gunnell ^b, K. Enfield ^c, R. Carpenter ^d, L. Barnes ^e, A.J. Mathers

Aim: To understand behaviours in the intensive care unit (ICU) that may facilitate establishment and nosocomial transmission of multidrug-resistant Gram negatives from a sink-trap reservoir to a patient.

Methods: Motion-sensitive cameras captured anonymized activity paired with periodic in person observations during a quality investigation from four ICU sinks (two patient rooms and two patient bathrooms) in a university hospital.

Findings: Of the 2973 videos with analysed behaviours there were 5614 observed behaviours which were assessed as: 37.4% medical care, 29.2% additional behaviours, 17.0% hand hygiene, 7.2% patient nutrition, 5.0% environmental care, 4.2% non-medical care. **Handwashing was only 4% (224 out of 5614) of total behaviours.**

Evidence – 2018 (continue)

Medical patient care:

- Fill syringe or medication cup
- Empty syringe or medication cup
- Drain IV bag
- Medical item cleaned
- Medical item placed
- Medical item removed
- Non-categorized medical liquid emptied

Non-medical patient care:

- Patient care item placed
- Patient care item removed
- Wetted/wrung patient rag

Patient nutrition:

- Food/beverage placed
- Food/beverage removed
- Non-water beverage emptied
- Water glass filled
- Water glass emptied

Reality.....



What is the way forward?

- Evidence based studies ?
 - *Characterizations of handwashing sink activities in a single hospital medical intensive care unit (USA)*
 - *Reduced rate of intensive care unit acquired gram-negative bacilli after removal of sinks and introduction of 'water-free' patient care (Netherlands)*
 - *Continued transmission of Pseudomonas aeruginosa from a wash hand basin tap in a critical care unit*
 - *The sink as a correctable source of extended-spectrum b-lactamase contamination for patients in the intensive care unit*
- Changing current regulations and guidelines?
 - Building Regulation 158 & 187
 - National building Act 103 of 1977
 - IUSS

Thank you