

Hand Hygiene Compliance: How Much is Enough?

Kent A. Sepkowitz, MD

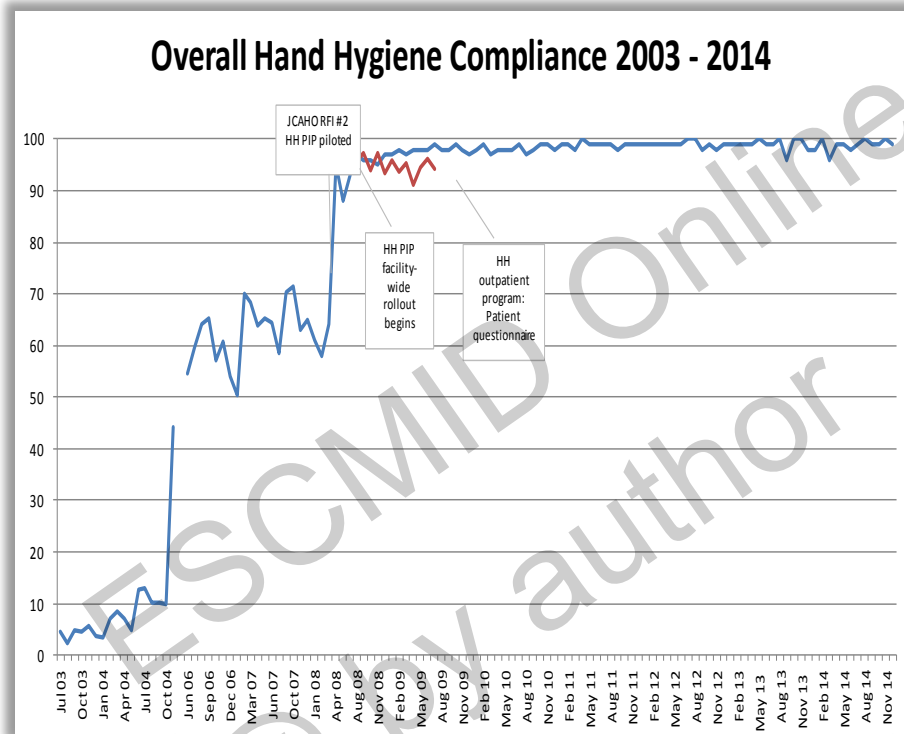
Memorial Sloan Kettering Cancer Center

Weill Cornell Medical College

New York NY

MSKCC, 2006 to 2014

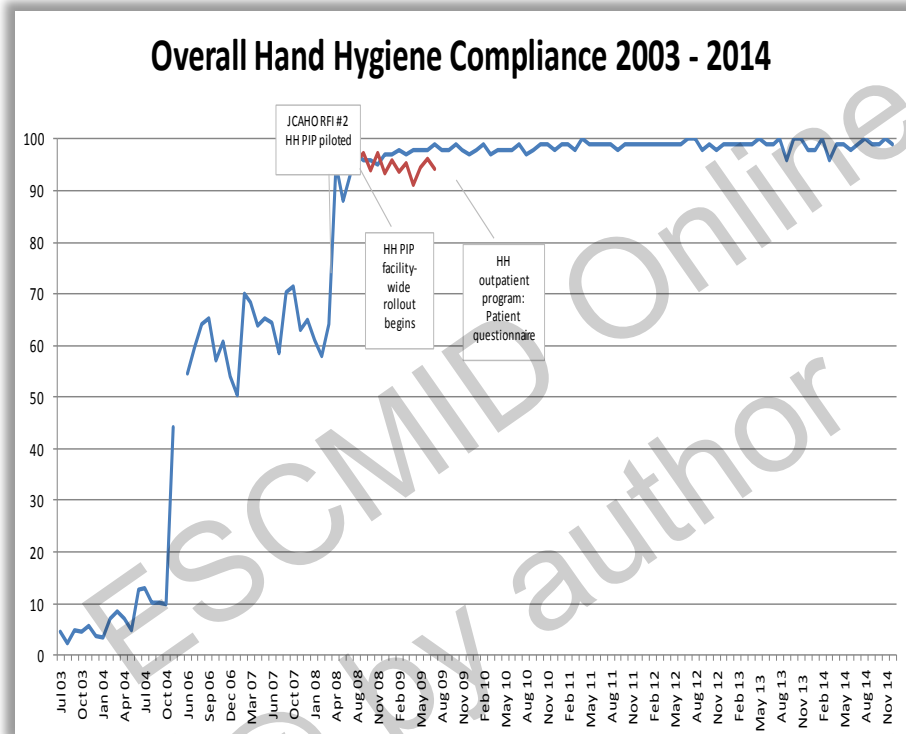
Improvement in Hand Hygiene compliance (2006-2014)



2006-2014

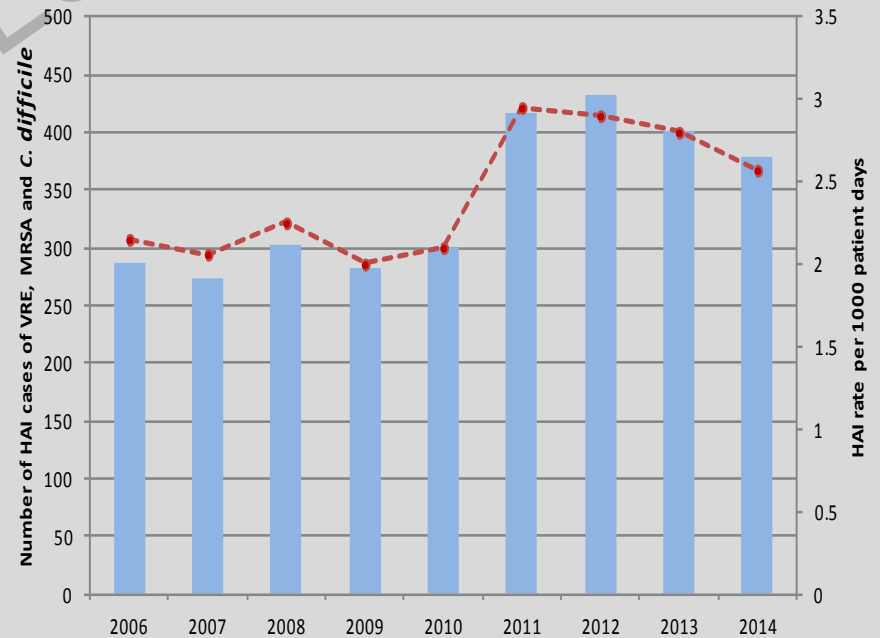
MSKCC, 2006 to 2014

Improvement in Hand Hygiene compliance
(2006-2014)



2006-2014

Healthcare associated infection rates
(2006-2014)



No Effect: Two Possibilities

- It takes 100% compliance 100% of the time to have a clinical impact
 - Like scrubbing for surgery

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- It takes 100% compliance 100% of the time to have a clinical impact
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OR

- We long-ago reached the maximal benefit for the intervention



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IGNAZ SEMMELWEIS

The **ETIOLOGY,**
CONCEPT, and
PROPHYLAXIS
of **CHILDBED**
FEVER

Translated by
K. CODELL CARTER

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In His Words

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- In examinations of pregnant, parturient, and puerperal women, the hand made unclean by cadaveric material was brought into contact with the genitals, hence the possibility of resorption and by resorption the convey of cadaveric matter in the vascular system of the patient.

Introduction of Antisepsis

- In order to destroy the cadaveric material adhering to the hands, I began about the middle of May, 1847, to employ chlorina liquida with which every student was required to wash his hands before making an examination. After a short time a solution of chlorinated lime was substituted because it was not so expensive.

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- In the first seven months mortality was 3 per cent compared to 11.4 per cent prior to introduction of antisepsis.

Cassandra



So Handwashing Works, Right?

- Um...

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More Facts about Vienna

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More Facts about Vienna

- In Vienna in 1846, almost 8000 babies were born at Semmelweis' hospital
 - “In the labor room they were examined in rows...”
- In contrast, a busy New York City public hospital delivers ~3000 babies a year in clean, well-lighted, plumbed, and spacious rooms

REVIEW

Role of hand hygiene in healthcare-associated infection prevention

B. Allegranzi ^{a,*}, D. Pittet ^{a,b}

^a *World Alliance for Patient Safety, World Health Organization, Geneva, Switzerland*

^b *Infection Control Programme, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland*

Available online 31 August 2009

KEYWORDS

Alcohol-based hand
rub; Hand hygiene;
Healthcare-associated

Summary Healthcare workers' hands are the most common vehicle for the transmission of healthcare-associated pathogens from patient to patient and within the healthcare environment. Hand hygiene is the leading measure for preventing the spread of antimicrobial resistance

Allegranzi-Pittet Summary

- More than 20 hospital-based studies of the impact of hand hygiene on the risk of HAI have been published between 1977 and 2008
 - 8 in NICU
- Per authors: 17 are positive

Recent Work: Vietnam Study

- One article from a **neurosurgical ward** in Vietnam describes wards that may resemble 19th century Vienna
 - Extreme overcrowding of patients: 1260 bed hospital with an occupancy rate of 144% and **few sinks**
- Introduction of hand hygiene had powerful effect

Effectiveness of an alcohol-based hand hygiene programme in reducing nosocomial infections in the Urology Ward of Binh Dan Hospital, Vietnam

Kim V. Nguyen¹, Phuong Tran My Nguyen² and Stephanie L. Jones³

1 Infection Control Department, Binh Dan Hospital, Ho Chi Minh City, Vietnam

2 Microbiology Department, Binh Dan Hospital, Ho Chi Minh City, Vietnam

3 International Consultant, Viet Nam Infection Prevention Program, Binh Dan Hospital, HO Chi Minh City, Vietnam

Summary

OBJECTIVES To determine the effectiveness of hand hygiene in a developing healthcare setting in reducing nosocomial infections (NIs).

METHOD Prospective study measuring NI rates in a urology ward in Ho Chi Minh City, Vietnam, before and after implementation of a hand hygiene programme with an alcohol-based decontaminant, and compliance rates of medical staff and carers with hand hygiene using standardised observation sheets.

RESULTS Incidence of NIs fell by 84%, from 13.1% to 2.1%, after implementation of the hand hygiene programme. Extended-spectrum beta-lactamase production was detected in 38.2%–50% of Enterobacteriaceae isolated from clinical samples. Length of patient stay and cost to the patient for antibiotics were reduced after implementation of the hand hygiene programme.

CONCLUSION The hand hygiene programme was effective in reducing incidence of NIs, leading to shorter inpatient stays and reduced treatment costs. Such programmes with measurable outcomes can be implemented at minimal cost in developing health contexts and should be promoted in all healthcare settings.

The Fine Print

- Prior to implementation of the hand hygiene programme, there was **virtually no hand hygiene** by medical or nursing staff, because of lack of facilities in the wards.
- Thus, compliance was not observed during the first study period, as it could reasonably be assumed to be close to 0%.
- After implementation of the programme, hand hygiene was practised most reliably after wound care (42.9% compliance by doctors, 64.3% compliance by registered nurses)

Recent Work: NICUs

- Taiwan 24 bed NICU with \$\$ incentives
 - Increase in HH from 43% to 74%
 - Significant decrease in HAI, esp respiratory infections
- Tiny infants with poorly developed integument and marginal immune competence may be unusually susceptible to otherwise trivial inocula

Compelling Evidence

- Hospitals without adequate plumbing
- NICUs

One Issue across Studies

- Many are done in outbreak situations
 - Rotavirus
 - MRSA
 - C diff
- The dynamics of transmission in outbreak situations surely differs – that is why there is an outbreak
- The remedy to interrupt an outbreak surely must differ from strategy for maintenance of low HAI rates

Allegranzi-Pittet Summary

- More than 20 hospital-based studies of the impact of hand hygiene on the risk of HCAI have been published between 1977 and 2008
 - 8 in NICU
- Per authors: 17 are positive
- **Per me: 4 are positive**

Prospective, Controlled, Cross-Over Trial of Alcohol-Based Hand Gel in Critical Care Units

Mark E. Rupp, MD; Teresa Fitzgerald, RN;
Susan Puumala, MS; James R. Anderson, PhD;
Rita Craig, RN; Peter C. Iwen, PhD; Dawn Jourdan, RN;
Janet Keuchel, RN; Nedra Marion, RN;
Delayne Peterson, PA; Lee Sholtz, RN;
Valerie Smith, RN

Infection Control and Hospital Epidemiology
Vol. 29, No. 1 (January 2008)

Conclusions. The introduction of alcohol-based gel resulted in a significant and sustained improvement in the rate of hand hygiene adherence. Fingernail length greater than 2 mm, wearing rings, and lack of access to hand gel were associated with increased microbial carriage on the hands. **This improvement in the hand hygiene adherence rate was not associated with detectable changes in the incidence of healthcare-associated infection.**

Handwashing in the intensive care unit: a big measure with modest effects

L. Silvestri^{a,*}, A.J. Petros^b, R.E. Sarginson^c, M.A. de la Cal^d, A.E. Murray^e, H.K.F. van Saene^f

^a*Emergency Department and Unit of Anaesthesia and Intensive Care, Presidio Ospedaliero di Gorizia, Via Vittorio Veneto 171, 34170 Gorizia, Italy*

^b*Paediatric Intensive Care Unit, Great Ormond Street Hospital for Children NHS Trust, London, UK*

^c*Department of Anaesthesia and Paediatric Intensive Care, Alder Hey Children's Hospital, Liverpool, UK*

^d*Department of Critical Care Medicine, Hospital Universitario de Getafe, Madrid, Spain*

^e*Department of Medical Microbiology, Wirral Hospital NHS Trust, Babington, Wirral, Merseyside, UK*

^f*Department of Medical Microbiology, University of Liverpool and Department of Clinical Microbiology/ Infection Control, Royal Liverpool Children's Hospital, Liverpool, UK*

KEYWORDS

Handwashing;
Intensive care unit;
Infection

Summary Handwashing is widely accepted as the cornerstone of infection control in the intensive care unit. Nosocomial infections are frequently viewed as an indicator of poor compliance of handwashing. The aim of this review is to evaluate the effectiveness of handwashing on infection rates in the intensive care unit, and to analyse the failure of handwashing. A literature search identified nine studies that evaluated the impact of handwashing or hand hygiene on infection rates, and demonstrated a low level of evidence for the efforts to control infection with handwashing. Poor compliance cannot be blamed as the only reason for the failure of handwashing to control infection. Handwashing on its own does not abolish, but only reduces transmission, as it is dependent on the bacterial load on the hand of healthcare workers. Finally, recent studies, using surveillance cultures of throat and rectum, have shown that, under ideal circumstances, handwashing can only influence 40% of all intensive care unit infections. A randomised clinical trial with the intensive care as randomisation unit is required to support handwashing as the cornerstone of infection control.

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Hand Hygiene

- Innocent until proven Innocent

Outcome Surrogates

- When you can't show a meaningful outcome, do not despair

Outcome Surrogates

- When you can't show a meaningful outcome, do not despair
- **Measure a process**



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journal homepage: www.elsevier.com/locate/jhin



Review

Hand hygiene monitoring technology: a systematic review of efficacy

J.A. Srigley^{a,*}, M. Gardam^b, G. Fernie^c, D. Lightfoot^d, G. Lebovic^e, M.P. Muller^f

^aInfection Prevention and Control, Hamilton Health Sciences, Hamilton, Canada

^bInfection Prevention and Control, University Health Network, Toronto, Canada

^cDepartment of Surgery, Toronto Rehabilitation Institute, University Health Network, Toronto, Canada

^dInformation Sciences, St Michael's Hospital, Toronto, Canada

^eApplied Health Research Centre, St Michael's Hospital, Toronto, Canada

^fKeenan Research Centre, St Michael's Hospital, Toronto, Canada

ARTICLE INFO

Article history:



Electronic and video monitoring systems (EMS/VMS) may improve hand hygiene by

Major article

Comparative efficacy of commercially available alcohol-based hand rubs and World Health Organization-recommended hand rubs: Formulation matters

Sarah L. Edmonds MS^{a,*}, David R. Macinga PhD^a, Patricia Mays-Suko BS^b, Collette Duley BS^b, Joseph Rutter BS^a, William R. Jarvis MD^c, James W. Arbogast PhD^a

^aResearch and Development, GOJO Industries, Akron, OH

^bBioScience Laboratories, Inc, Bozeman, MT

^cJason and Jarvis Associates, LLC, Hilton Head, SC

Key Words:

Hand hygiene
Health care personnel hand wash
Hand Sanitizer
EN 1500

Background: Use of alcohol-based hand rubs (ABHRs) effectively reduces transmission of pathogenic microorganisms. However, the impact of alcohol concentration and format on product efficacy is currently being debated.

Methods: Two novel ABHR formulations containing 70% ethanol were evaluated according to American Society for Testing and Materials E1174 (Health Care Personnel Handwash [HCPHW]) and European Norm (EN) 1500 global standards. Additionally, using E1174, the efficacy of these formulations was compared head-to-head against 7 representative commercially available ABHRs and 2 World Health

So How Much Hand Hygiene is Enough?

- One study with a follow-up of eight years showed a sustained compliance increase of up to a **maximum of 66%** and succeeded in parallel to maintain the achieved reduction in HAI rates of <10%.
- To achieve 100% compliance is not strictly necessary to determine improvement of patient safety at the bedside.
- On the other hand, **the goal of sustained 100% compliance appears unlikely to be achieved** because of the complex range of factors influencing HCWs' behaviour related to hand hygiene performance.

Allegranzi, Pittet, 2010

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OR

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So If Hand Hygiene Doesn't Work, What Does?



Conclusions

- Hand hygiene is necessary but not sufficient to prevent HAI

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 - This is a big disappointment

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- Hand hygiene is necessary but not sufficient to prevent HAI
 - This is a big disappointment
- **Environmental interventions are relatively passive and should be explored extensively**