HAND HYGIENE: NOT JUST FOR HEALTH CARE WORKERS ANYMORE!

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DISCLOSURES

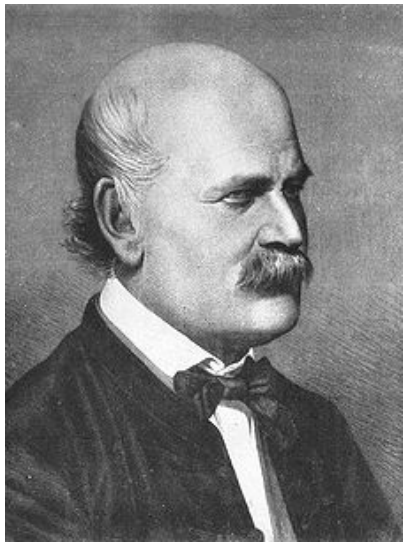
- No conflicts of interest

OBJECTIVES

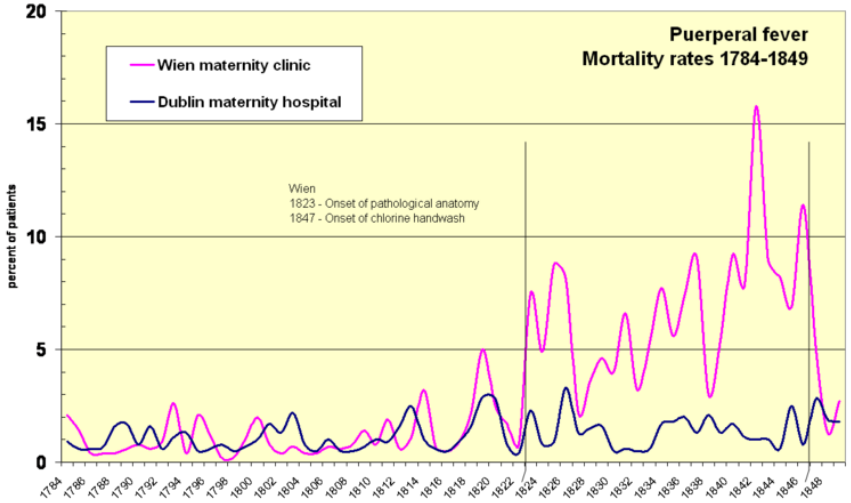
- Understand the importance of patient and visitor hand hygiene
- Be aware of data on patient and visitor hand hygiene knowledge, attitudes, and practices
- Discuss how to improve patient and visitor hand hygiene

INTRODUCTION: HAND HYGIENE THEN AND NOW

HISTORY OF HAND HYGIENE IN HEALTH CARE




Die Aetiologie, der Begriff
und
2633
die Prophylaxis
des
Kindbettfiebers.
Von
Ignaz Philipp Semmelweis.
Pest, Wien und Leipzig.
C. A. Hartleben's Verlags-Expedition.



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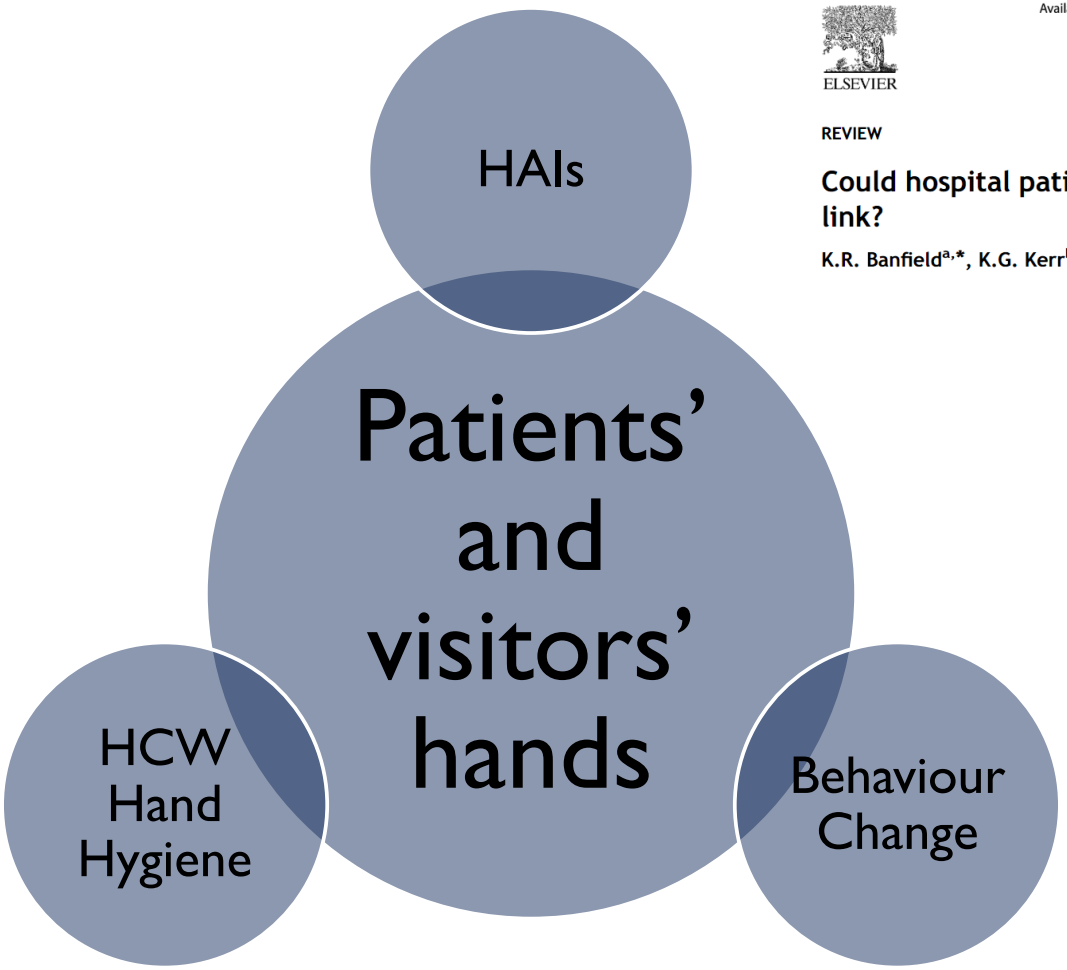
FROM SEMMELWEIS TO NOW

- Hand hygiene among health care workers (HCWs) remains suboptimal despite decades of improvement initiatives
  - Systematic review showed 40% overall compliance (Erasmus, 2010)
  - Systematic review of studies conducted during the COVID-19 pandemic showed 74% compliance (Wang, 2021)
- Changing HCW hand hygiene behaviour is difficult
- Health care-associated infections (HAIs) remain one of the most common adverse events in hospitals (Schwendimann, 2018)
  - Since the beginning of the pandemic, increases in many HAIs have been reported (Fleisher, 2022)



Journal of Hospital Infection (2005) 61, 183–188
Available online at www.sciencedirect.com
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REVIEW

Could hospital patients' hands constitute a missing link?

K.R. Banfield[a,*], K.G. Kerr[b]

WHY IS PATIENT AND VISITOR HAND HYGIENE IMPORTANT?

TRANSMISSION CAN OCCUR VIA PATIENTS' HANDS

Istenes, 2013

- 357 patients admitted to 6 post-acute care facilities
  - Any multi-drug resistant organism 24.1%
  - MRSA 10.9%
  - VRE 13.7%
  - Resistant Gram negative bacilli 2.8%

Cao, 2016

- 100 hand samples from patients on medical/surgical units
  - One pathogen 39%
  - Gram negative 34%
  - C. difficile 14%
  - MRSA 14%
  - VRE 9%

PATIENT HAND HYGIENE HAS BEEN SHOWN TO PREVENT HAIS

Author, Year	Results
Pokrywka, 2014	CDI rate 10.45/10,000 patient days before to 6.95/10,000 patient days after; p=0.0009
Gagne, 2010	MRSA 10.6/1,000 admissions before to 5.2/1,000 admissions after
Cheng, 2007	6 outbreaks affecting 66 patients (18.2%) before; 4 outbreaks affecting 23 patients (4.4%) after; p=0.005 for total patients involved
Thu, 2007	SSI decreased from 8.3% to 3.8% on intervention unit and increased from 7.2% to 9.2% on control unit; p=0.04 for comparison between units
Hilburn, 2003	Nosocomial infection rate 8.2% before to 5.3% after
Peters, 1992	Puerperal mastitis 2.90% before to 0.66% after; p<0.001

PATIENT HAND HYGIENE MAY IMPROVE HCW HAND HYGIENE

- Cognitive dissonance
  - HCWs who emphasize the importance of hand hygiene to patients may change their behaviour to be consistent
- Study of a patient hand hygiene protocol in an ICU (Fox, 2015)
  - Staff hand hygiene before room entry increased from 35% to 66%
  - After room exit increased from 66% to 79%

WHAT ARE PATIENTS' AND VISITORS' HAND HYGIENE KNOWLEDGE, ATTITUDES, AND PRACTICES?

PATIENT HAND HYGIENE ATTITUDES AND PERCEPTIONS (WU, 2013)

- Cross-sectional survey of patients and family members in a teaching hospital in Taiwan
  - 859 respondents
- 89.8% considered hand hygiene important
- 78.4% would like more information on hand hygiene
  - More likely if they had experienced an HAI (odds ratio, 2.48; 95% confidence interval, 1.57-3.89; P < .001)

PATIENT HAND HYGIENE KNOWLEDGE AND ATTITUDES (SRIGLEY, 2020)

- Survey and interviews of inpatients at adult acute care (4) and chronic care (1) hospitals
  - 268 surveys and structured interviews with 23 randomly selected patients
- All agreed that patient hand hygiene is important and prevents infection
- Patients know they should perform hand hygiene after toileting, but less awareness of other moments
- 75% said they would not like to receive more information about hand washing while in the hospital
  - "I'm old enough to know these things," "I think I know enough about it"
  - "I know from when you're raised, you're taught to wash your hands and everything, you know? It's only pigs that wouldn't do it."

PEDIATRIC AND MATERNITY HAND HYGIENE KNOWLEDGE AND ATTITUDES (LEE, 2021)

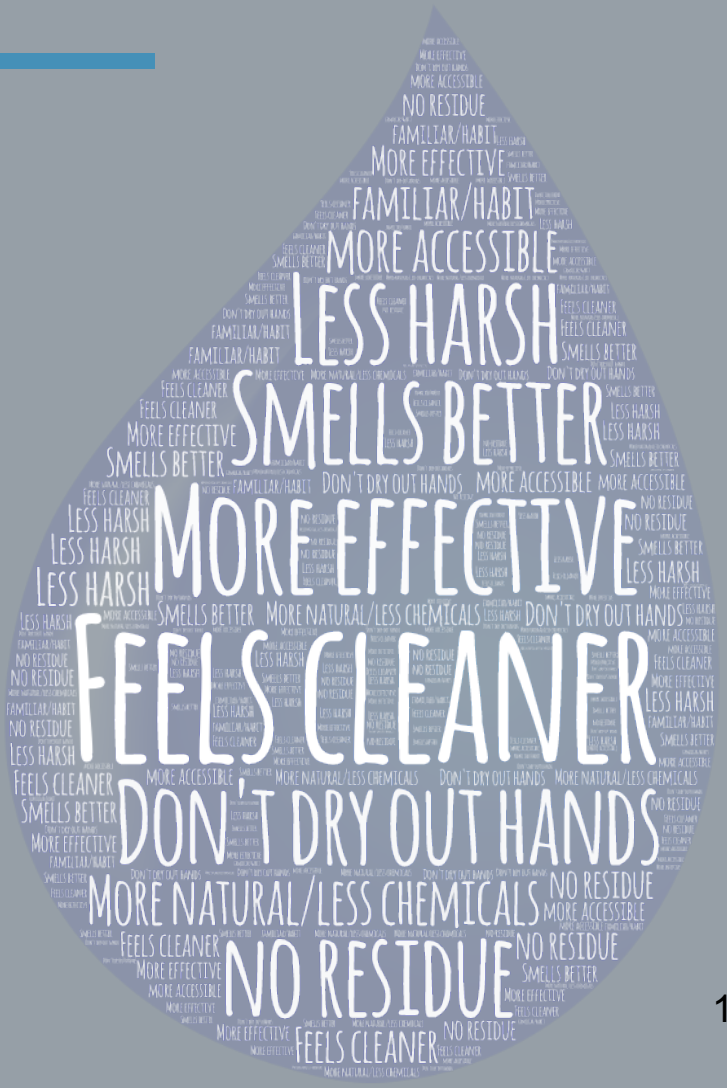
	Pediatric Patients	Adult Patients	Family/Visitors
Number of respondents (%)	26 (8)	126 (36)	196 (56)
Median age in years (range)	15 (11-16)	35 (21-42)	36 (14-66)
Female (%)	65	100	69
Prefer soap and water over alcohol-based hand rub (ABHR)	89	90	85
Staff talked to them about hand hygiene	50	24	43
Agree that families/visitors need to do more hand hygiene	88	97	93
Agree that patients need to do more hand hygiene	74	92	73

Why Do Patients/ Visitors Prefer Soap and Water?

"It has been relayed to me to be the most effective way to clean."

"Hand sanitizer kills too many important bacteria for immune systems."

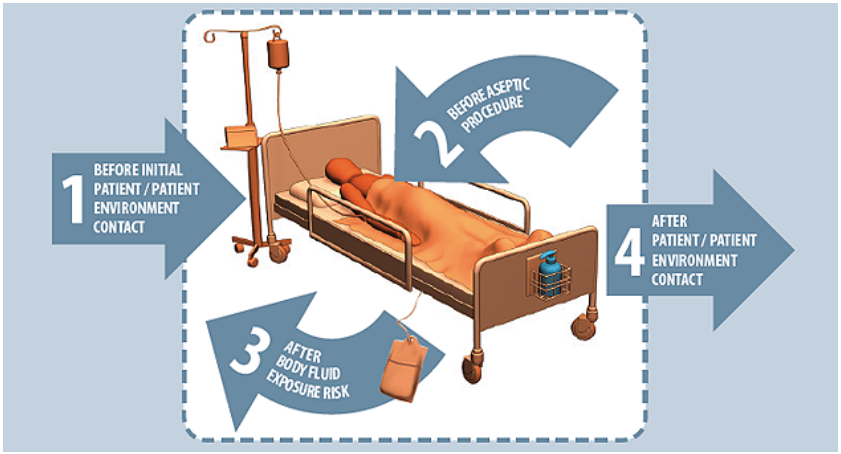
"Because my mother said so."



KEY FACILITATORS AND BARRIERS

Theoretical Domain	Survey Statement(s)	Representative Quotes
Beliefs about consequences	Washing my hands prevents me from getting sick; washing my hands prevents other people in the hospital from getting sick	"Protect other patients and myself from spread of infection;" "to prevent transmission of infections/diseases, especially to my newborn"
Social influences	By regularly washing my hands, I can be a role model for others to regularly wash their hands	"Seeing other people wash;" "Seeing nurses and doctors wash/sanitize"
Environmental context and resources	Hand cream is not located in convenient areas	"Hands get dry, sore, and cracked with such frequent washing;" "frequent hand washing causes damage to my skin, it will be helpful to provide hand creams too"

INDICATIONS FOR PATIENT AND VISITOR HAND HYGIENE



- Before patient/patient environment contact
  - Upon entering their room (or facility/clinic)
  - Before contacting clean supplies
- Before "aseptic procedures"
  - Prior to eating
  - Taking meds, administering injections, wound care, etc.
- After body fluid exposure
  - After toileting/diapering
  - After coughing/sneezing/etc.
- After patient/patient environment contact
  - Upon leaving their room (or facility/clinic)

PATIENT HAND HYGIENE RATES

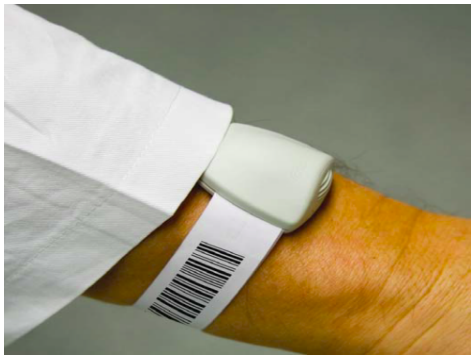
- Emergency department survey (Luz, 2011)
  - Patients reported hand hygiene after 62-88% of bathroom visits and after 13-41% of bedside urinal/bedpan uses
- 24 hours of direct observation in a hospital (Randle, 2010)
  - Patient/visitor HH was 67.5% after body fluid exposures and 50% after contact with patient surroundings
- "Covert observation" by junior doctors (Mattam, 2012)
  - Hand hygiene performed by patients during 73% of meals
- Study on pediatric wards (Randle, 2013)
  - Only found 1 child to observe, who had 100% compliance
- University hospital in Hong Kong (Cheng, 2016)
  - 26.9% before meals/medications, 27.5% after urinal/bedpan use, 89.7% after using toilet facilities

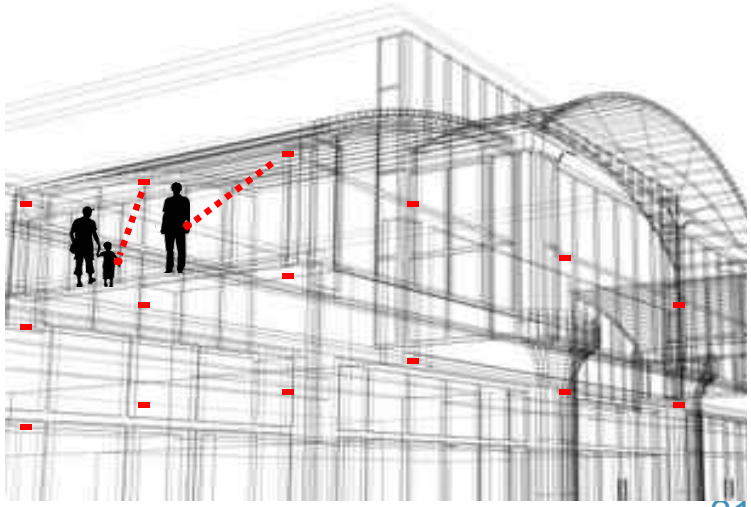
HAND HYGIENE RATES AT A PEDIATRIC AND MATERNITY HOSPITAL (LEE, 2021)

Moment	Self-Report	Direct Observation
Before contact with patient/patient environment	39-74%	10%
Before "aseptic procedure"	32-96%	15%
After blood/body fluid exposure	37-96%	53%
After contact with patient/patient environment	48-62%	3%

ELECTRONIC MONITORING OF PATIENTS

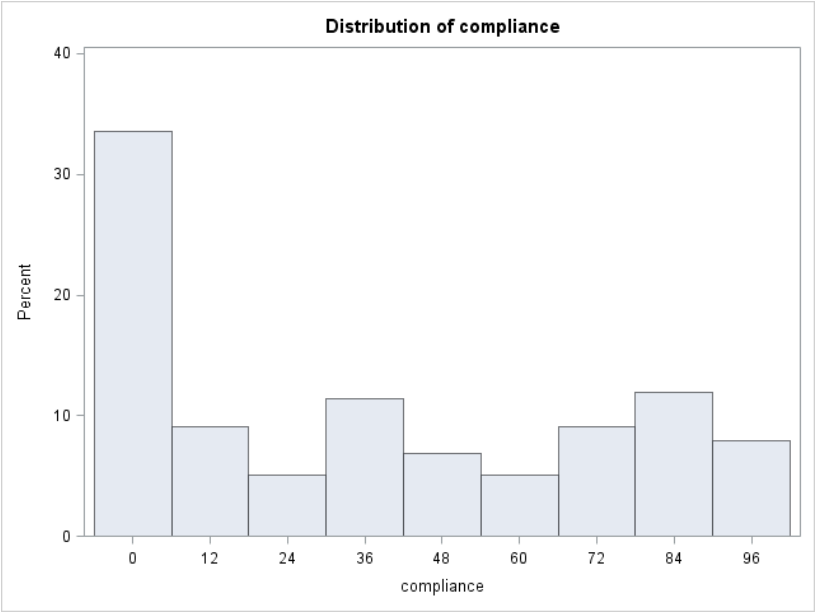
- Hand hygiene on a multi-organ transplant unit measured by a real-time locating system (RTLS) for 9 months (Srigley, 2014)





HAND HYGIENE RATES (SRIGLEY, 2014)

- After using the bathroom
  - 29.7% of 12,649 bathroom visits
  - More likely among women and after 12 pm
- Before eating
  - 39.1% of 6,005 meal times
  - Ranged from 32.2% at breakfast to 45.9% at dinner
  - 3.3% of 1,122 kitchen visits
- Room entry and exit
  - 2.9% of 5,786 entries and 6.7% of 5,779 exits
  - More likely in the afternoon and on weekdays



n=176 patient-room stays

HOW CAN PATIENT AND VISITOR HAND HYGIENE BE IMPROVED?

EXAMPLES OF INTERVENTIONS

Author, Year	Intervention
Loveday, 2021	Patients received hand wipe pack and information card; written protocol for staff
Manresa, 2020	Staff either received education on patient hand hygiene or were instructed to clean patients' hands daily with alcohol-based wipes daily
Rai, 2019	Patients received education, posters, and bedside ABHR
Pokrywka, 2014	Education, reminders, and alcohol wipes on meal trays; staff and volunteers encouraged to clean patient hands at mealtimes
Lary, 2013	Pediatric wards randomized to interactive educational activities using "Glo-Yo," mobile learning technology, or control
Ardizzone, 2012	Staff education on surgical units and audits to assess whether they assisted patients with hand hygiene
Hedin, 2012	Patients at a rehab centre received education and ABHR in bathrooms; staff gave out alcohol wipes at mealtimes and were encouraged to remind/assist patients with hand hygiene

EXAMPLES OF INTERVENTIONS

Author, Year	Intervention
Whiller, 2000	Hand wipe containers and reminder signs attached to commodes
Gagne, 2010	All inpatients at a community hospital in Quebec received education and ABHR twice daily x ~1 year
Cheng, 2007	Staff gave ABHR to all inpatients in a psychiatric unit every 4 hours during the day x ~1 year
Thu, 2007	Inpatients on a neurosurgical unit in Vietnam received ABHR and education
Hilburn, 2003	Patients received ABHR and education x 10 months; posters reminded staff, patients, and visitors about hand hygiene
Peters, 1992	Maternity patients provided with ABHR at bedside x 10 months, then withdrawn x 2 months and reinstated x 2 months

SYSTEMATIC REVIEW (SRIGLEY, 2016)

- Objective: to determine the efficacy of patient hand hygiene interventions in reducing infections and improving patient hand hygiene compliance
- 10 studies met inclusion criteria
- Targets of the interventions
  - Patients (5/10)
  - Healthcare workers (HCWs) (3/10)
  - Both (2/10)
- Components of the interventions were similar to the WHO multimodal approach
  - Provision of product (8/10)
  - Education (7/10)
  - Reminders (3/10)
  - Audits (1/10)

MULTIMODAL HAND HYGIENE STRATEGIES

- System change
- Training and education
- Evaluation and feedback
- Reminders in the workplace
- Institutional safety climate

Cochrane Database of Systematic Reviews | Review - Intervention

New search | Conclusions changed

Interventions to improve hand hygiene compliance in patient care

Dinah J Gould, Donna Moralejo, Nicholas Drey, Jane H Chudleigh, Monica Taljaard Authors' declarations of interest

Version published: 01 September 2017 Version history

https://doi.org/10.1002/14651858.CD005186.pub4

- "A variety of single intervention strategies and combinations of strategies…led to increased hand hygiene compliance in most studies, regardless of setting. However, the **certainty of the evidence varied from very low to moderate**, depending on the strategy. What remains unclear is which strategy or combination of strategies is most effective in a given context."

GOING BEYOND THE MULTIMODAL STRATEGY

Behaviour Change

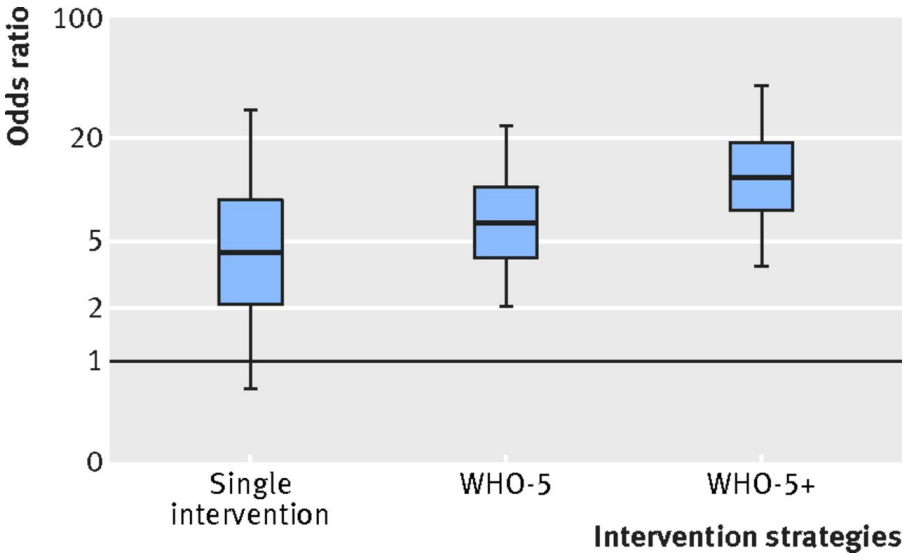
- Individual level
- Based on psychological theories

Culture Change

- "The way we do things around here"
- Group interactions
- Based on sociological theories

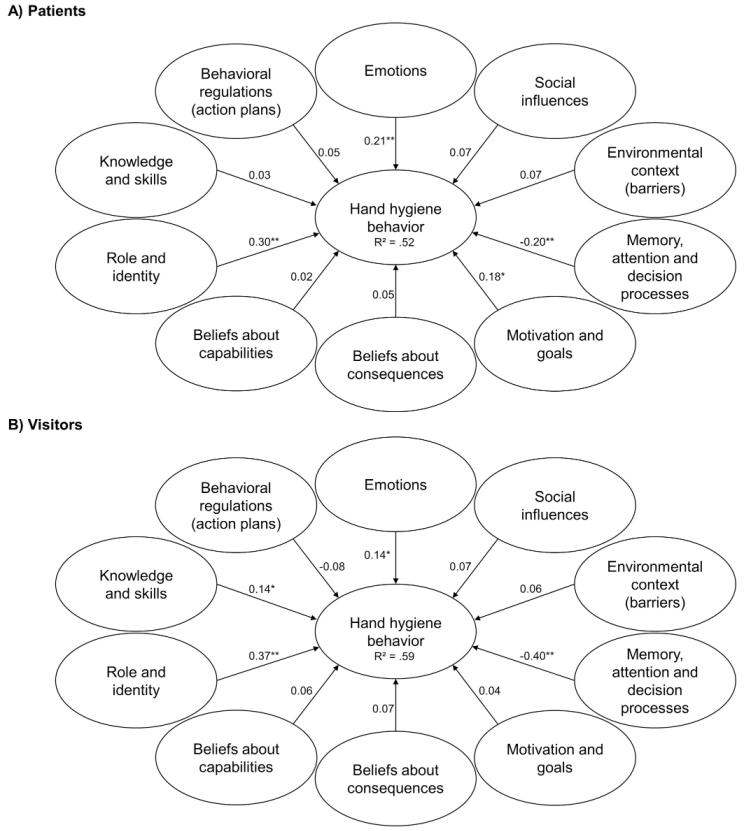
ADDING BEHAVIOUR CHANGE STRATEGIES (LUANGASANATIP, 2015)

- Systematic review and network meta-analysis
- Compared 3 types of studies:
  - Single interventions
  - WHO approach
  - WHO approach + goal setting, incentives, or accountability



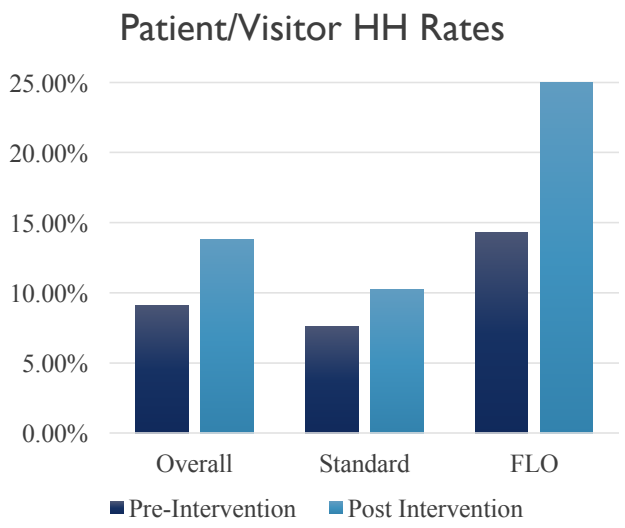
BEHAVIOUR CHANGE FOR PATIENTS/VISITORS (GAUBE, 2021)

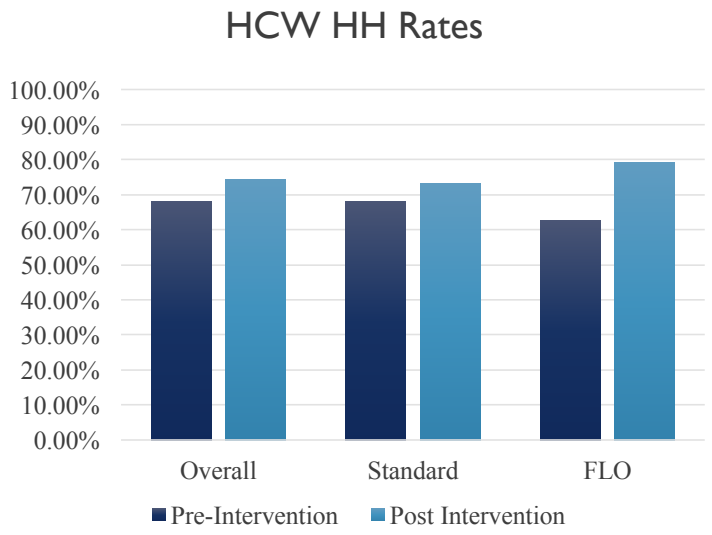
- Survey of 1605 patients and visitors to find a theoretical model to explain hand hygiene practice and identify predictors for hand hygiene behaviour
- Most suitable model was Theoretical Domains Framework
- Key determinants included:
  - Role and identity
  - Motivation and goals
  - Memory, attention and decision processes
  - Emotions
  - Knowledge and skills



CULTURE CHANGE (WONG, 2020)

- Compared a standard intervention (education and reminders) to a front-line ownership intervention ("positive deviance")
- Stepped wedge cluster randomized controlled design





#HANDHYGIENEHEROES CAMPAIGN

- Background and rationale
  - Building on survey findings (e.g. beliefs about consequences; focus on ABHR)
  - Use momentum of COVID-19
  - Front-line ownership approach
- Vision
  - To create a culture where hand hygiene is "just what we do around here"
- Goal
  - Improve patient/family hand hygiene rates to ≥60% in one year

TIMELINE

Phase 1

Summer 2021

Patients & Families

- Baseline HH observations
- Virtual toolkit launch
- Social media

Phase 2

Fall 2021

Unit-specific Initiatives

- Demos during patient room orientation
- Hand out HH materials & hand sanitizer

Phase 3+

2022+

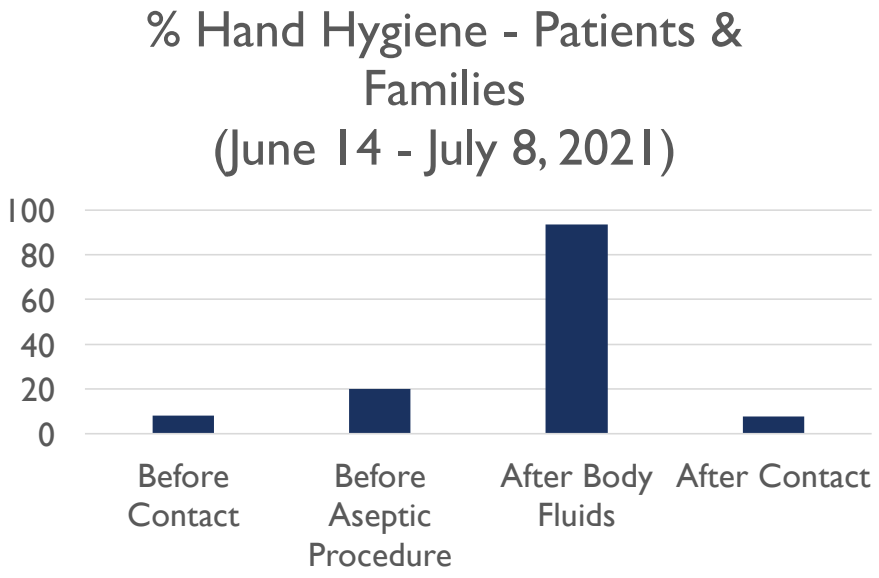
Everyone

- Ongoing sustainment & evaluation
- New initiatives?

BASELINE HAND HYGIENE OBSERVATIONS

Overall patient & family hand hygiene:

14.3%



TOOLKIT


BE A HAND HYGIENE HERO!
PROTECT EVERYONE AGAINST INFECTION.
BC Children's Hospital
BC WOMEN'S HOSPITAL+ HEALTH CENTRE
Provincial Health Services Authority
Province-wide solutions. Better health.
HAND HYGIENE HERO!
#HHHeroes


BE A HAND HYGIENE HERO!
ADD
RUB
DRY
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BE A HAND HYGIENE HERO.
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HAND HYGIENE HERO!
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TOOLKIT

Patient and Visitor Hand Hygiene Education Checklist on Admission:

Interventions	Completed?
Review important moments for hand hygiene in the hospital: ❑ Before entering and after exiting patient rooms or clinic areas ❑ Before eating or feeding (including breastfeeding) ❑ Before taking or giving medication ❑ Before entering the kitchen, playroom, or other shared areas ❑ After using the toilet or commode ❑ After changing a diaper	
Teach patients/visitors when to use Alcohol-Based Hand Rub (ABHR) and when to use Soap & Water: ❑ ABHR for when your hands are NOT visibly dirty ❑ Soap & Water for when your hands are visibly dirty and/or you are on Contact Plus precautions ❑ Emphasize that ABHR is the gold-standard because it kills infectious organisms on contact and contains moisturizers to protect your skin	
Demonstrate hand hygiene technique with ABHR or Soap & Water to patients/visitors (see "How to Rub!" posters)	
If your *patient* is on additional precautions, explain that they are not allowed to use shared spaces on the unit (e.g., kitchen, playroom). If the patient is on Contact Plus or Airborne precautions, family members also should not use shared spaces.	
Activity sheets printed and given to patients (preschool and school-aged children)	
Hand hygiene pamphlet given to and reviewed with patients, families, and visitors	

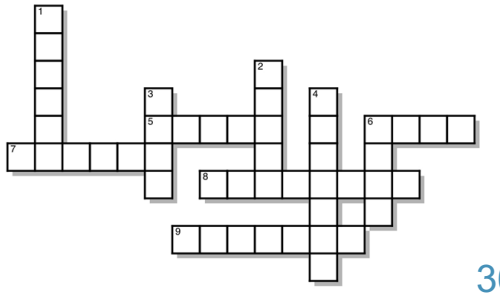
Patient/Guardian Signature:

Hand Hygiene Activity Sheet

Complete the puzzles to learn about clean hands and win a prize!

Circle each of the things that germs can live and grow on.
Colour each of the things that can help get rid of germs!

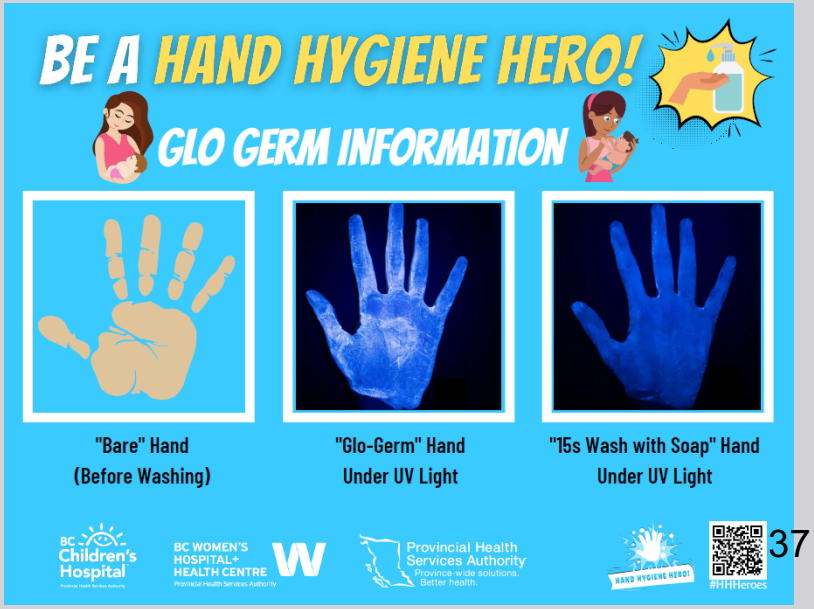
Hand Washing Crossword



UNIT-SPECIFIC INITIATIVES

HH Demo

UV Light Activity



CONCLUSIONS

- Patient and visitor hand hygiene is important
- Patients and visitors do not perform adequate hand hygiene
- Interventions to improve patient hand hygiene reduce HAIs, but quality of evidence is low
- Interventions have been multifactorial with components similar to healthcare worker HH programs
- Encouraging use of ABHR is important
- Tailor components to your setting
- Need to go beyond the basics and look at behaviour and culture change strategies

QUESTIONS?

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REFERENCES

- Ardizzone LL, Smolowitz J, Kline N, Thom B, Larson EL. Patient hand hygiene practices in surgical patients. Am J Infect Control 2013;41(6):487-91.
- Cao J, Min L, Lansing B, Foxman B, Mody L. Multidrug-resistant organisms on patients' hands. JAMA Int Med 2016;176(5):705-6.
- Cheng VC, Wu AK, Cheung CH, Lau SK, Woo PC, Chan KH, et al. Outbreak of human metapneumovirus infection in psychiatric inpatients: implications for directly observed use of alcohol hand rub in prevention of nosocomial outbreaks. J Hosp Infect 2007;67(4):336-43.
- Cheng V, Tai J, Li WS, Chau PH, So SYC, Wong L, et al. Implementation of directly observed patient hand hygiene for hospitalized patients by hand hygiene ambassadors in Hong Kong. American Journal of Infection Control 2016;44:621-4.
- Erasmus V, Daha TJ, Brug H, Richardus JH, Behrendt MD, Vos MC, van Beeck EF. Systematic review of studies on compliance with hand hygiene guidelines in hospital care. Infect Control Hosp Epidemiol 2010;31(3):283-94.
- Fleisher LA, Schreiber M, Cardo D, Srinivasan A. Health care safety during the pandemic and beyond — building a system that ensures resilience. New Engl J Med 2022;386:609-11.
- Fox C, Wavra T, Ash Drake D, et al. Use of a patient hand hygiene protocol to reduce hospital-acquired infections and improve nurses' hand washing. Am J Crit Care 2015;24(3):216-24.
- Gagne D, Bedard G, Maziade PJ. Systematic patients' hand disinfection: impact on meticillin-resistant Staphylococcus aureus infection rates in a community hospital. J Hosp Infect 2010;75(4):269-72.
- Gaube S, Fischer P, Lermer E. Hand(y) hygiene insights: Applying three theoretical models to investigate hospital patients' and visitors' hand hygiene behavior. PLoS ONE 2021;16(1):e0245543.
- Gould DJ, Moralejo D, Drey N, Chudleigh JH, Taljaard M. Interventions to improve hand hygiene compliance in patient care. Cochrane Database Syst Rev 2017;9. https://doi.org//10.1002/14651858.CD005186.pub4
- Hedin G, Blomkvist A, Janson M, Lindblom A. Occurrence of potentially pathogenic bacteria on the hands of hospital patients before and after the introduction of patient hand disinfection. APMIS 2012;120(10):802-7.Hilburn J, Hammond BS, Fendler EJ, Groziak PA. Use of alcohol hand sanitizer as an infection control strategy in an acute care facility. Am J Infect Control 2003;31(2):109-16.
- Istenes N, Bingham J, Hazelett S, Fleming E, Kirk J. Patients' potential role in the transmission of health care-associated infections: prevalence of contamination with bacterial pathogens and patient attitudes toward hand hygiene. Am J Infect Control 2013;41:793-8.
- Lary D, Hardie K, Randle J. Improving children's and their visitors' hand hygiene compliance. Antimicrob Resist Infect Control 2013;2(Suppl 1):P166.
- Lee Z, Lo J, Luan Y, Fernando J, Johannesen D, Masuda C, Swallow T, Srigley JA. Patient, family, and visitor hand hygiene knowledge, attitudes, and practices at pediatric and maternity hospitals: A descriptive study. American Journal of Infection Control 2021;49(8):1000-7.
- Loveday HP, Tingle A, Wilson JA. Using a multimodal strategy to improve patient hand hygiene. Am J Infect Control 2021;49:740-5.
- Lugangasanatip N, Hongsuwan M, Limmathurotsakul D, Lubell Y, Lee AS, Harbarth S, Day NPJ, Graves N, Cooper BS. Comparative efficacy of interventions to promote hand hygiene in hospital: systematic review and network meta-analysis. BMJ 2015;351:h3728.

REFERENCES

- Luz J, Cydulka RK, Scott S. Evaluation of patient hygiene practices during emergency department visits. Ann Emerg Med 2011;58(Suppl 4):S198.
- Manresa Y, Abbo L, Sposato K, de Pascale D, Jiminez A. Improving patients' hand hygiene in the acute care setting: Is staff education enough? Am J Infect Control 2020;48:1100-1.
- Mattam K, Al-Badawi T, King S, Guleri A. The missing link in the health-care associated infection acquisition cycle: An innovative patient hand-hygiene audit led by doctors at a tertiary cardiac centre in northwestern England. Clin Microbiol Infec 2012;18(Suppl s3):809.
- Peters F, Flick-Fillies D, Ebel S. Hand disinfection as the central factor in prevention of puerperal mastitis. Clinical study and results of a survey. Geburtshilfe Frauenheilkd 1992;52(2):117-20.
- Pokrywka M, Feigel J, Douglas B, et al. A bundle strategy including patient hand hygiene to decrease Clostridium difficile infections. Medsurg Nurs 2014;23(3):145-8.
- Rai H, Saldana C, Gonzalez-Orta MI, Kinghton S, Cadnum JL, Donskey CJ. A pilot study to assess the impact of an educational patient hand hygiene intervention on acquisition of colonization with health care–associated pathogens. Am J Infect Control 2019;47(3):334-6.
- Randle J, Arthur A, Vaughan N. Twenty-four-hour observational study of hospital hand hygiene compliance. J Hosp Infect 2010;76(3):252-5.
- Randle J, Firth J, Vaughan N. An observational study of hand hygiene compliance in pediatric wards. J Clin Nurs 2013;22(17-18):2586-92.
- Srigley JA, Furness CD, Gardam M. Measurement of patient hand hygiene in multiorgan transplant units using a novel technology: an observational study. Infect Control Hosp Epidemiol 2014;35(11):1336-41.
- Srigley JA, Furness CD, Gardam M. Interventions to improve patient hand hygiene: a systematic review. J Hosp Infect 2016;94(1):23-9.
- Srigley JA, Cho S, O'Neill C, Bialachowski A, Ali RA, Lee C, Mertz D. Hand hygiene knowledge, attitudes, and practices among inpatients in an acute care hospital: a descriptive study. American Journal of Infection Control 2020;48(5):507-10.
- Schwendimann R, Blatter C, Dhaini S, Simon M, Ausserhofer D. The occurrence, types, consequences and preventability of in-hospital adverse events – a scoping review. *BMC Health Serv Res* 2018;18:521. https://doi.org/10.1186/s12913-018-3335-z
- Semmelweis I. Etiology, Concept and Prophylaxis of Childbed Fever, translated by Carter, K. Codell, University of Wisconsin Press, 1983. ISBN 0-299-09364-6.
- Thu LTA, Dibley MJ, Nho VV, Archibald Lennox, Jarvis WR, Sohn AH. Reduction in surgical site infections in neurosurgical patients associated with a bedside hand hygiene program in Vietnam. Infect Control 2007;28:583-8.
- Wang Y, Yang J, Qiao F, Feng B, Hu F, Xi Z, Wu W, Ni Z, Liu L, Yuan Y. Compared hand hygiene compliance among healthcare providers before and after the COVID-19 pandemic: A rapid review and meta-analysis. Am J Infect Control 2021, in press. https://doi.org/10.1016/j.ajic.2021.11.030.
- Whiller J, Cooper T. Clean hands: how to encourage good hygiene by patients. Nurs Times 2000;96(46):37-8.
- Wong MWH, Xu YZ, Bone J, Srigley JA. Impact of patient and visitor hand hygiene interventions at a pediatric hospital: A stepped wedge cluster randomized control trial. Am J Infect Control 2020;48:511-6.

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March 17, 2022	**INFECTION CONTROL IN CORRECTIONAL FACILITIES** Speaker: **Nyreith Adeyemi**, California Correctional Health Care Services
April 7, 2022	**MANAGEMENT PRACTICES FOR LEADERS TO PROMOTE INFECTION PREVENTION** Speaker: **Dr. Ann Scheck McAlearney**, Ohio State University College of Medicine
April 14, 2022	**LIFECYCLE OF MOLECULAR MICROBIOLOGY DIAGNOSTIC TECHNOLOGY: COST VERSUS CLINICAL BENEFIT BEFORE BECOMING OBSOLETE** Speaker: **Professor Colum Dunne**, School of Medicine, University of Limerick, Ireland
April 28, 2022	*(FREE Teleclass)* **HOW DO WE IMAGINE OUR FUTURE? THE INFECTION PREVENTION "CRYSTAL BALL INITIATIVE"** Speaker: **Dr. Hugo Sax**, HumanLabZ, Switzerland

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