Why Should we Do Hand Washing

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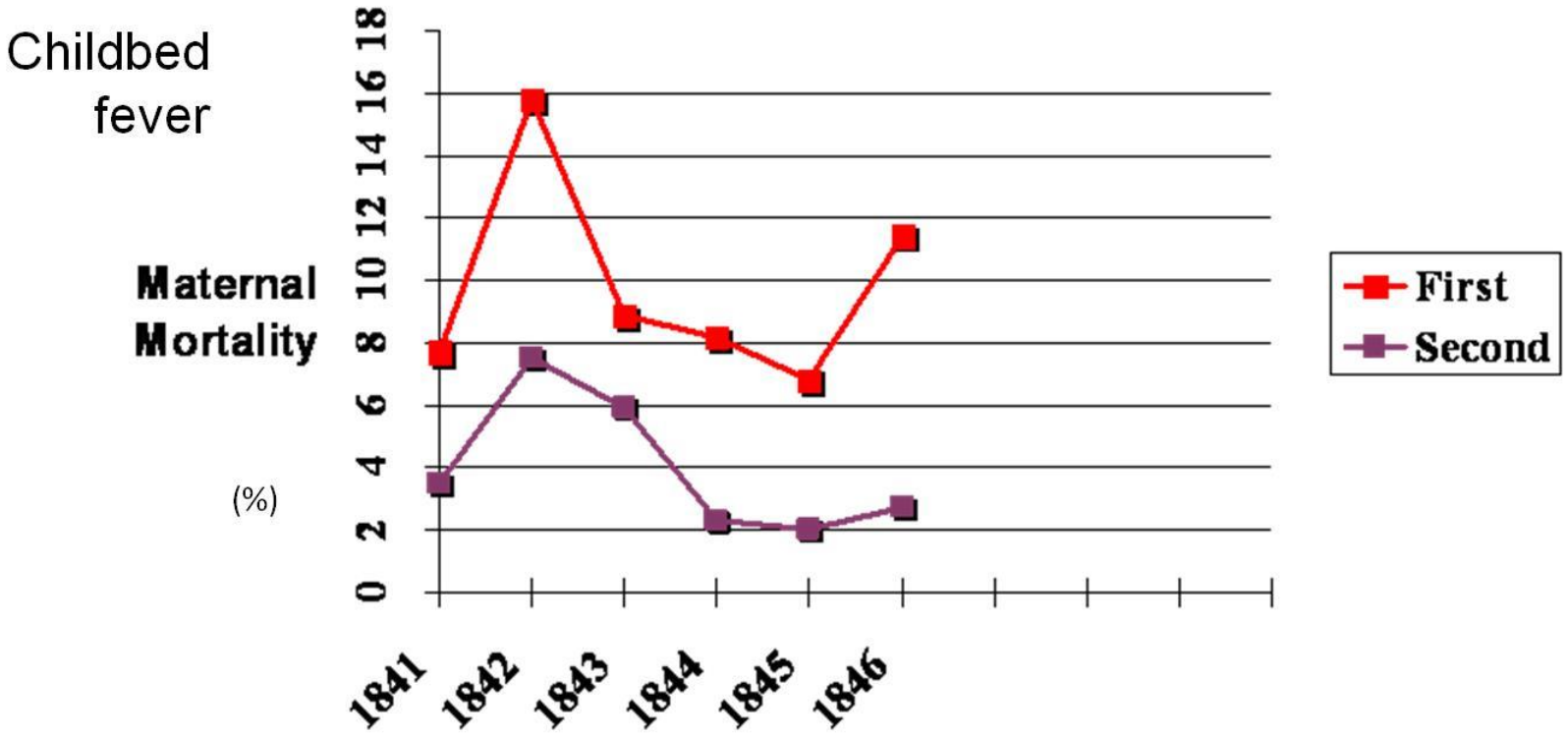
Ignaz Philip Semmelweis (1818 – 1865)

- Hungarian born doctor
- Worked in Vienna
- Mortality rate in Doctor led ward 3 times higher than Midwife led ward
- Doctors worked in autopsy room, then delivered women afterward
- Semmelweis identified link in 1846 & introduced chlorinated lime for hand washing
- Mortality rate fell dramatically

Maternal mortality rates, First and Second Obstetrics Clinics, GENERAL HOSPITAL OF VIENNA, 1841-1846



Semmelweis IP, 1861

Intervention

1922:: French pharmacist > solutions contain chlorides of lime or soda could eradicate the foul odors of hand

Students and doctors were required to:

clean their hands with a chlorinated lime solution when entering the labour room

May 1847

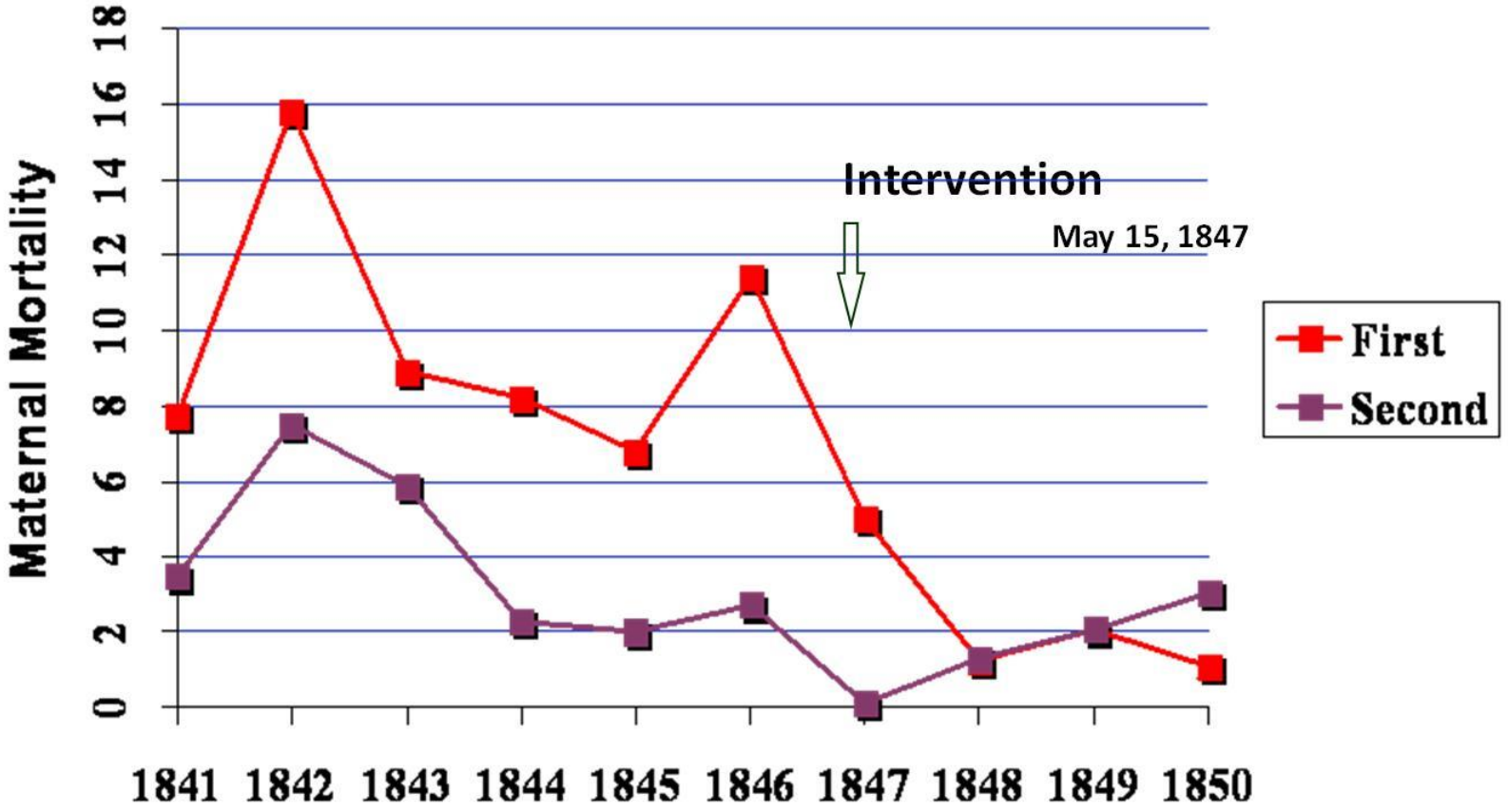
in particular when moving from the autopsy to the labour room

Does Handwashing Work?

Semmelweis - 1847

Month	Births	Deaths	% Mortality
April	312	57	18.3
May	294	36	12.2
June	268	6	2.4
July	250	3	1.2

Maternal mortality rates, First and Second Obstetrics Clinics, GENERAL HOSPITAL OF VIENNA, 1841-1850



Semmelweis IP, 1861

Healthcare Associated Infections (HCAI)

An infection occurring in a patient during the process of care in a hospital or other health care facility which was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.

The Burden of HCAI's

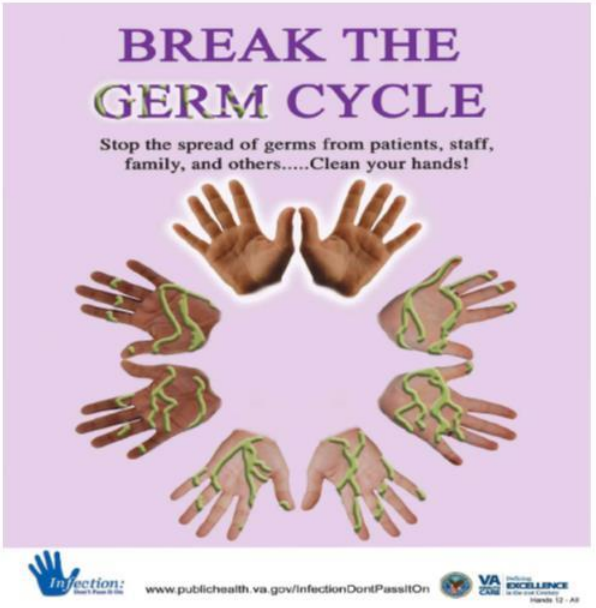
- At any time, over 1.4 million people worldwide are suffering from infections acquired in hospital.
- Up to 50% of HCAIs could have been prevented.

More than 220,000 patients acquire healthcare associated infections (HCAIs) in Canada every year resulting in 8,000 – 12,000 deaths.

5-10% in developed countries
10-30% in developing countreis

Why Is Hand Hygiene Important?

Hand hygiene is the undisputed single most effective infection control measure in prevention of HAI's



Hands and Germ Transmission:

A health-care workers hands when not clean are the main route of cross-transmission of potentially harmful germs between patients in a health care facility

What are your hands carrying?

- **Resident Flora:**
- Deep seated
- Difficult to remove
- Part of body's natural defence mechanism
- Associated with infection following surgery/invasive procedures.

- **Transient Flora:**
- Found only at times
- Come from patients or inanimate surfaces
- Survive and occasionally multiply
- 4-16% of the hand surface is exposed by single direct contact
- Transmissibility depends on species, numbers, survival ability, and dermal water content

CRE, ESBLS, MRSA, VRE, yeast, spores, virus

- - dominant *Staph. epidermidis* and other Cog negative staph
- - one study: 64% of HCW hands harbor MRSE

TABLE 1. Contamination rates of health care workers' hands with nosocomial pathogens and their persistence on hands and inanimate surfaces[a]

Pathogen	Contamination rate(s) of health care workers' hands (%) (references)	Duration of persistence on hands (references)	Duration of persistence on inanimat (references)
Acinetobacter spp.	3–15 (132, 335, 519)	≥150 min (33)	3 days–5 mo (166, 233, 387, 393, 596,
B. cereus	37 (569)	Unknown	Unknown
C. difficile	14–59 (362, 491)	Unknown	≥24 h (vegetative cells), up to 5 mo (
E. coli	Unknown	6–90 min (33, 151)	2 h–16 mo (3, 111, 190, 350, 376, 3
"Gram-negative bacteria"	21–86.1 (4, 7, 166, 187, 271, 302, 378)	Unknown	Unknown
Influenzavirus, parainfluenzavirus	Unknown	10–15 min (25, 46)	12–48 h (46, 72, 433, 614)
HAV	Unknown	Several hours (354, 355)	2 h–60 days (1, 2, 356)
HCV	8–23.8 (11)	Unknown	Unknown
Klebsiella spp.	17 (81)	Up to 2 h (33, 81, 151, 514)	2 h–30 mo (111, 190, 376, 393, 509
MRSA	Up to 16.9 (378, 412, 542)	Unknown	4 wk–7 mo (114, 581)
P. vulgaris	Unknown	≥30 min (33)	1–2 days (376)
Pseudomonas spp.	1.3–25 (53, 119, 144, 420, 607)	30–180 min (33, 119)	6 h–16 mo (111, 178, 190, 393, 509
Rhinovirus	Up to 65 (191, 457)	Unknown	2 h–7 days (456, 497)
Rotavirus	19.5–78.6 (490)	Up to 260 min (22)	6–60 days (1, 2, 24)
Salmonella spp.	Unknown	≤3 h (427)	6 h–4.2 yr (209, 376, 467)
S. marcescens	15.4–24 (90, 492)	≥30 min (33)	3 days–2 mo (111, 376)
S. aureus	10.5–78.3 (90, 101, 179, 359, 378, 412, 546)	≥150 min (33)	4 wk–7 mo (190, 394, 509, 581, 582)
VRE	Up to 41 (202)	Up to 60 min (402)	5 days–4 mo (39, 393, 394, 402, 599)
"Yeasts," including *Candida* spp. and *Torulopsis glabrata*	23–81 (90, 112, 221, 378, 541)	1 h (79, 564)	1–150 days (65, 452, 564)

[a] Persistance of nosocomial pathogens on inanimate surfaces is important because of the high rate of acquisition of these pathogens on the hands afte environmental surfaces (58)

Fact 1

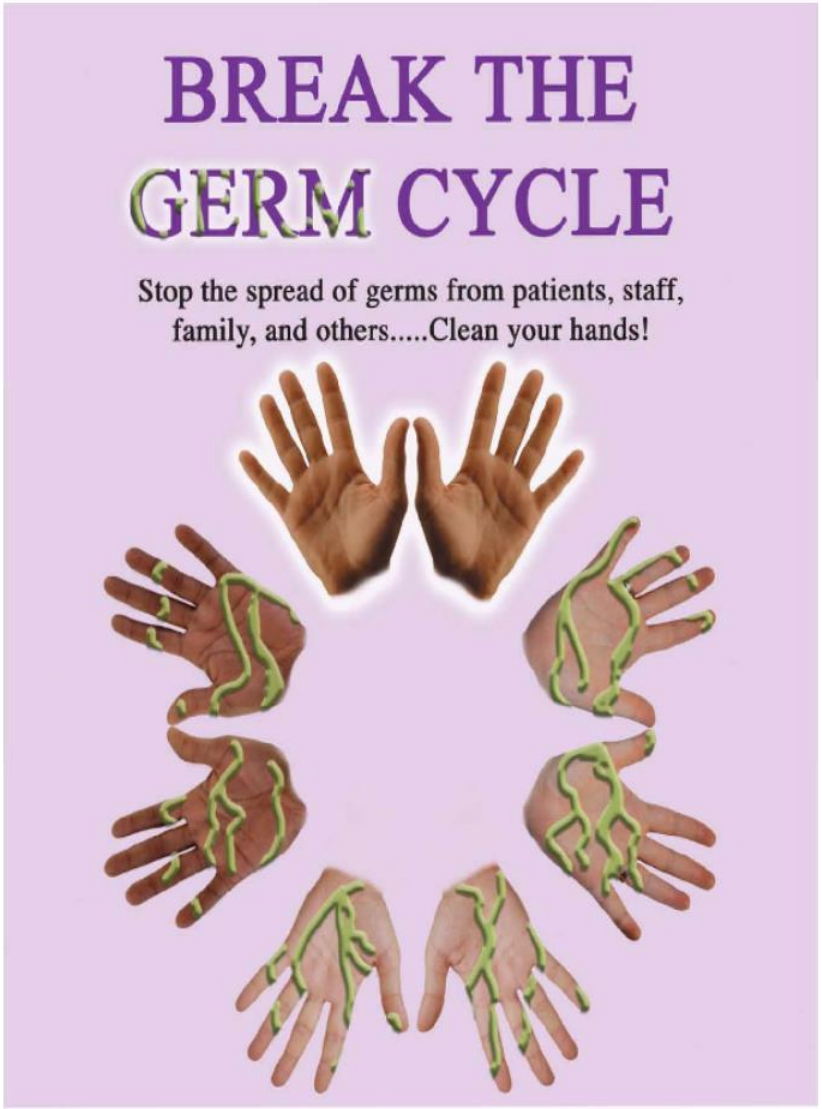
80% of all infectious diseases are transmitted by touch.

Fact 2

The Solution to Pollution is Dilution.

While soap may not kill all Germs, thorough hand washing will decrease the numbers to a point below the infectious threshold.

THE UNWASHED HAND!



Three types of preparations

1- Plain, non-medicated Soup (social hand wash)

* mechanical removal of dirt, germs, and organic matters (polarity)

2- Medicated Soup (antiseptic and surgical hand wash)

* Chlorohexadine 2-4%
* Triclosan 1%
* Hexachlorophene ------ ***banned worldwide, toxic.***

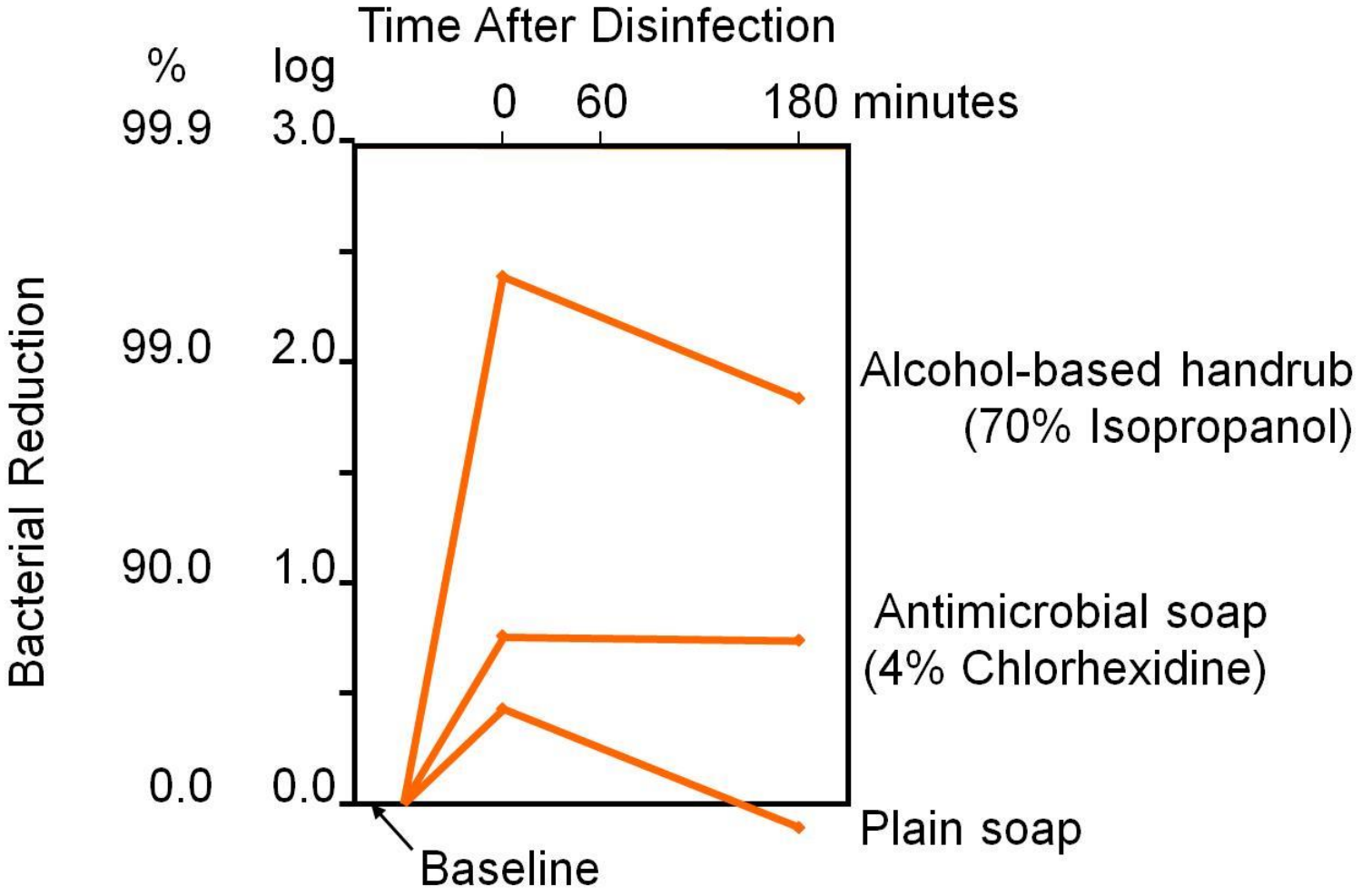
3- Alcohol- based hand rub (hygienic and surg. Disinfection)

* 70% ethanol or Isopropanol

(Recently: Non-alcohol based waterless antiseptic agents, Quaternary ammonium type compounds)

Efficacy of Hand Hygiene Preparations in Killing Bacteria

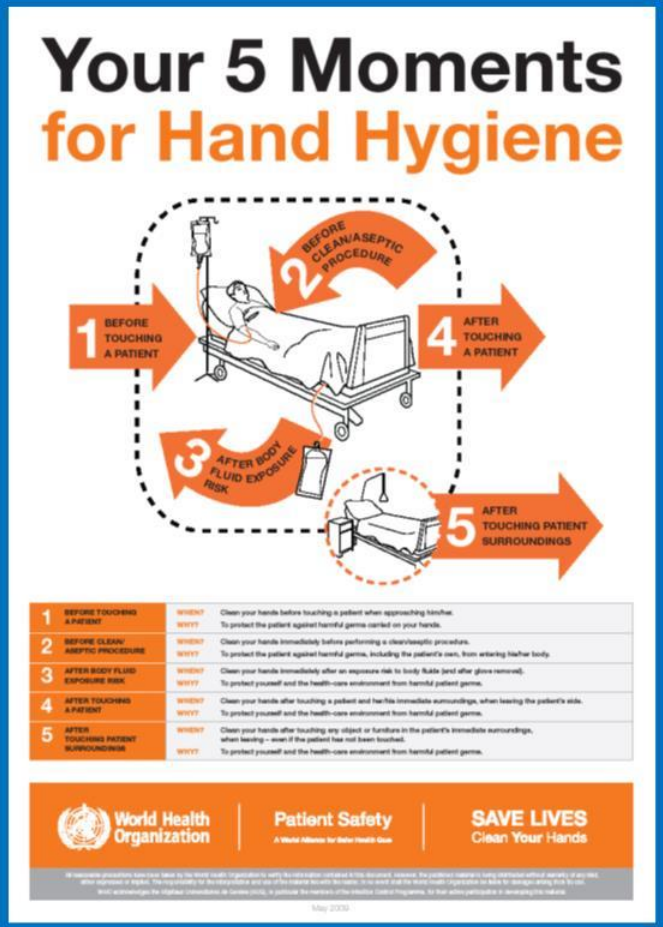
Ability of Hand Hygiene Agents to Reduce Bacteria on Hands



Adapted from: *Hosp Epidemiol Infect Control*, 2nd Edition, 1999.

WHO “My five (KEY) moments for hand hygiene”

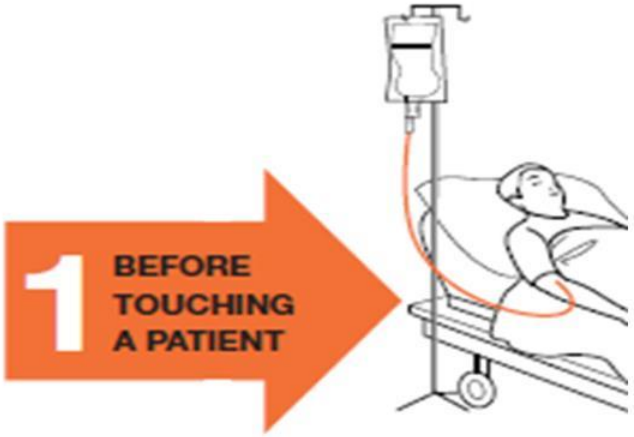
1. Before touching a patient
2. Before clean/aseptic procedure
3. After body fluid exposure risk
4. After touching a patient
5. After touching patient surroundings



BEFORE touching a patient

Why?

To protect the patient against harmful germs carried on your hands



BEFORE clean/aseptic procedures

Why?

To protect the patient against harmful germs, including the patients own, from entering his/her body

West Virginia Bureau for Public Health
Your Health Your Safety Our Purpose
Department of Health & Human Resources

AFTER body fluid exposure risk

Why?

To protect yourself and the health-care environment from harmful patient germs

West Virginia Bureau for Public Health
Your Health Your Safety Our Purpose
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AFTER touching a patient

Why?

To protect yourself and the health-care environment from harmful patient germs

AFTER touching patients surroundings

Why?

To protect yourself and the health-care environment from harmful patient germs

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Wash your hands with plain soap or with antimicrobial soap and water if:

- Your hands are visibly soiled (dirty)
- Hands are visibly contaminated with blood or body fluids
- Before eating
- After using the restroom
- Wash all surfaces thoroughly -- fingers, between fingers, palms, wrists, back of hands

Use a waterless hand-rub for routinely cleaning your hands:

- Before having direct contact with patients
- After having direct contact with a patient's skin
- After having contact with body fluids, wounds or broken skin
- After touching equipment or furniture near the patient
- After removing gloves
- Do not use an waterless hand-rub when hands are visibly soiled or contaminated with blood or body fluids.

Time

- Optimal hand hygiene using an alcohol-based hand rub takes 20-30 seconds
- Optimal hand hygiene using soap and water takes 40-60 seconds
- Both are effective methods

Time Spent Cleansing Hands:
one nurse per 8 hour shift

- Hand washing with soap and water: 56 minutes
  - Based on seven (60 second) handwashing episodes per hour
- Alcohol-based handrub: 18 minutes
  - Based on seven (20 second) handrub episodes per hour

~ Alcohol-based handrubs reduce time needed for hand disinfection ~

Voss A and Widmer AF, *Infect Control Hosp Epidemiol* 1997:18;205-208.

What we Know

- In summary we know:
  - Bugs are on our hands
  - Bugs can be washed off
  - Washing bugs off our hands saves lives

- So what is the problem???

  - HCWs don't wash their hands!!!

Fact 3

Caught in the act (or lack of)

A poll of pediatric ICU physicians showed that they claimed their rate of hand washing between patients was

73%,

but when followed and observed, the hand washing rate was found to be less than

10%.

so

Do as I say, not as I do...

Why we don't wash our hands

- Too busy/insufficient time
- Patient needs take priority
- Understaffing/overcrowding
- Sinks are inconveniently located or lack of sinks
- Lack of soap and paper towels
- Hand washing agents cause irritation and dryness
- Low risk of acquiring infection from patients

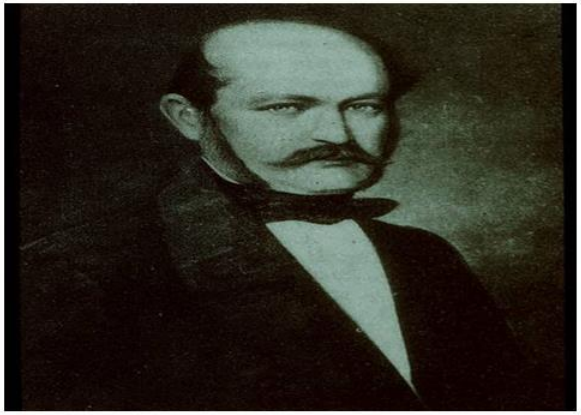
HCW are not bad just busy!

Poor design

Poor product

More education

Adapted from Pittet D, *Infect Control Hosp Epidemiol* 2000;21:381-386.



The ‘‘savior of mothers’’.

‘‘You, Herr Professor, have been a partner in this massacre.’’

‘‘Should you, Herr Hofrath, without having disproved my doctrine, continue to train your pupils [against it], Ideclare before God and the world that you are a murderer and the‘History of Childbed Fever’ would not be unjust to you if it memorialized you as a medical Nero.’

Ignaz Philipp Semmelweis

‘God knows the number of patients who went prematurely to their graves because of

me,

THANKS

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