

## Abstracts #4

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**TITLE** Hand hygiene and patient care : pursuing the Semmelweiss legacy  
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Despite the understanding of hand hygiene and its' impact on patient care and transmission of infection, compliance is disgracefully poor in healthcare workers. Appropriate hand hygiene continues as the leading criteria in the reduction of risk of infection whether in the clinical environment, school or daycare.

### HISTORY

By 1847, Semmelweiss had identified the risk to infection and concomitant death for those maternity patients in a Paris hospital cared for by physicians who had come straight from the pathology lab without washing as compared to the other patient population cared for by midwives. By insisting that these same physicians and medical students wash their hands in an antiseptic solution prior to physical examination, he was able to dramatically reduce infection rates and decrease mortality. At roughly the same time in the US (1843) Oliver Wendell Holmes had concluded that puerperal fever was spread by healthcare workers' hands. For both men, their findings were met with resistance from their peers and resulted in loss of their respective positions.

### SKIN FLORA

The skin is a source for two groups of microbes, those that are colonizing or resident flora and those that are contaminating or transient flora. Colonizing flora are difficult to remove mechanically and transient flora have short survival times on the hands but are quite pathogenic if transferred. The ideal hand hygiene program should be:

- Quick
- Reduce hand contamination to the lowest possible level
- Free of noticeable side effects on practitioners' hands

Today the quality of handwashing is poor and compliance is usually less than 50%. In most studies compliance was higher by nurses than doctors. Many factors have been implicated as barriers to good hand hygiene including:

- Products causing skin irritation and dryness
- Patient needs taking priority over hand hygiene
- Sinks located inconveniently
- Glove use negates the need for good hand hygiene
- Insufficient time for hand hygiene
- High workload
- Poor staffing
- Inadequate knowledge of guidelines or protocols
- Lack of role models
- Lack of recognition of cross-contamination opportunities
- Lack of knowledge about research findings where hand hygiene decreases infection rates
- Forgetfulness

### GLOVE USE

Glove wearers are implicated in non-compliance with hand hygiene in two studies and in fact, studies have demonstrated that washing and reusing gloves is not prudent. In addition, because of the unapparent defects in gloves, "wearing of gloves should not be considered as an alternative to hand hygiene."

### SKIN IRRITATION

Skin irritation is a barrier to hand hygiene compliance. The more superficial layers of the skin contain water to keep the skin soft and lipids to prevent dryness. Hand decontamination can:

- Increase skin pH
- Reduce lipid content



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- Increase transdermal water loss, and
- Increase microbial shedding

Soaps and detergents are damaging to the skin and healthcare workers need to be better informed about their choice of hand hygiene agents. Many experts believe that lack of knowledge and education are barriers to motivation. In particular, it is important to know that:

- Alcohol formulations are less irritating than most antiseptic detergent agents
- Alcohols with the addition of emollients are as tolerable and efficacious as detergents
- Applying emollients is recommended and may be protective by preventing loss of resident flora and therefore preventing cross-contamination
- Hand lotions help to protect the skin and may reduce microbial shedding

Irritant dermatitis is common among healthcare workers. Recent studies have demonstrated less irritation and drying than commonly used detergent preparations. Boyce's study comparing soap and water to alcohol-based hand hygiene products is quoted (see abstract).

### **TIME CONSTRAINT**

In the large epidemiological survey of hand hygiene average compliance was 48%. Analysis of the findings revealed:

- Noncompliance was lower among nurses than other healthcare workers and one the weekends
- Noncompliance was higher in critical care units, during procedures with a high risk of bacterial contamination and when patient acuity was high

In other words, the greater the risk, the lower the compliance. The greater the number of opportunities for hand washing, the greater the decrease in compliance. The highest compliance was found in pediatric care at 59%. Findings also showed a variation in compliance by unit, type of healthcare worker, indicating focused education may be useful.

In an ICU environment there may be as many as 40 opportunities for handwashing every hour, making the statement "no time for handwashing" not an excuse, but a reality. Estimates show that it takes approximately one minute to leave the bedside, walk to the sink, wash and dry the hands, and return to the bedside. A bedside handrub requires approximately 20 seconds making an alcohol-based handrub the answer to three problems: lack of facilities, lack of time, and skin problems.

### **HAND HYGIENE PROMOTION**

Despite the best educational strategies, changes in hand hygiene compliance have been transient at best. Behavioral theories have targeted individuals and insufficient to sustain change. Multi-factorial parameters must be considered, including the climate of the institution when attempting to affect change.

Behavioral change is dynamic and must include a combination of education, motivation and system change. The factors that are necessary for change are:

- Dissatisfaction with the current situation
- A perception of alternatives, individual and institutional
- One's ability and potential to change

Reported reasons for non-compliance include:

- The lack of hand hygiene promotion
- Lack of participation at the individual and institutional levels
- The frequent lack of a role model among senior staff
- The lack of institutional priority for hand hygiene
- The lack of administrative sanctions for non-compliance or rewarding of compliance
- The lack of an institutional climate of safety encompassing:
  - Top management commitment
  - Visible safety programs
  - Low level of work stress
  - Tolerant and supportive attitude towards reported problems
  - Belief in the efficacy of preventive strategies



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### **CHOICE OF HAND-HYGIENE AGENT**

The efficacy of antiseptic agents is compared. The quick kill and broad spectrum characteristics of alcohol are emphasized as are its ready use as a handrub because facilities are not required for its use, ready availability at the point of use and lack of contamination of clinical garments. TO increase the efficacy of alcohol-based preparations, another compound that increases its residual effect is added to give it persistence. It is important to note that alcohol handrubs have no effect against soil.

Although the potential for resistance to antiseptic agents is a real possibility, to date there hasn't been any convincing evidence.

### **SUCCESS STORIES**

Many studies are presented with a discussion of accomplishments and limitations are presented. Research issues and an agenda are proposed.

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