Hand Hygiene Update for SJMH House Officers:
Essential Element for Prevention Health Care-Associated Infections

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REMARKABLE MEDICINE. REMARKABLE CARE.
Introduction: This course will discuss Hand Hygiene in relation to Health Care-Associated Infections (HAI) and the different ways to decrease the spread of infections.

Objectives: Upon completion of this course you will be able to:

1. Define Health Care Associated Infection (HAI)
2. Discuss the role of the “environment” in HAI’s
3. Discuss the health care worker’s role in reducing HAI’s
4. Discuss how and when gloves should be worn
5. Discuss how hand washing and hand rubs are to be used in the hospital setting
Global Impact of HAIs

- At any time, over 1.4 million people worldwide are suffering from infections acquired in health-care facilities.
- In modern health-care facilities in the developed world: 5–10% of patients acquire one or more infections.
- In developing countries the risk of HCAI is 2–20 times higher than in developed countries and the proportion of patients affected by HCAI can exceed 25%.
- In intensive care units, HCAI affects about 30% of patients and the attributable mortality may reach 44%.
You may have seen or heard of HAI’s in the news recently.....
# Distribution of HAIs and their risk factors

<table>
<thead>
<tr>
<th>Site of Infection</th>
<th>Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lower respiratory tract infections</strong></td>
<td>Mechanical ventilation, aspiration, nasogastric tube, central nervous system depressants, antibiotics and anti-acids, prolonged health-care facilities stay, malnutrition, advanced age, surgery, immunodeficiency.</td>
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<tr>
<td><strong>Urinary tract infections</strong></td>
<td>Urinary catheter, urinary invasive procedures, advanced age, severe underlying disease, urolithiasis, pregnancy, diabetes.</td>
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<tr>
<td><strong>Surgical site infections</strong></td>
<td>Inadequate antibiotic prophylaxis, incorrect surgical skin preparation, inappropriate wound care, surgical intervention duration, type of wound, poor surgical asepsis, diabetes, nutritional state, immunodeficiency, lack of training and supervision.</td>
</tr>
<tr>
<td><strong>Blood infections</strong></td>
<td>Vascular catheter, neonatal age, critical care, severe underlying disease, neutropenia, immunodeficiency, new invasive technologies, lack of training and supervision.</td>
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</tbody>
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**Lack of hand hygiene**
Basic, but important principle

The Epidemiologic Triangle of Cross Transmission
Most MDROs are transmitted via hands of HCWs

Contaminated inanimate surface  \(\rightarrow\)  direct transmission  \(\rightarrow\)  Susceptible patient

Hands of healthcare worker  \(\rightarrow\)  Compliance in hand hygiene: ~ 50%

Kramer A
BMC Infect Dis 2006;6:130
### 5 stages of hand transmission

<table>
<thead>
<tr>
<th>one</th>
<th>two</th>
<th>three</th>
<th>four</th>
<th>five</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germs present on patient skin and immediate environment surfaces</td>
<td>Germ transfer onto healthcare worker’s hands</td>
<td>Germs survive on hands for several minutes</td>
<td>Suboptimal or omitted hand cleansing results in hands remaining contaminated</td>
<td>Contaminated hands transmit germs via direct contact with patient or patient’s immediate environment</td>
</tr>
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Comparative Efficiency of Cross Transmission of Pathogens: Physicians vs Nurses

- % Adherence with Hand Hygiene
  - MDs = 43
  - RNs = 59

- MDs have less frequent contact with patients, however…

- Relative risk of patient contact =
  - 1.6 higher/hour for MD vs RN
  - Lower likelihood of clustering of patient assignments

- Need to engage all healthcare personnel in hand hygiene promotion

Nijssen S, et al. Relative risk of physicians and nurses to transmit pathogens in a MICU. Arch Int Med 2003
Adherence with Hand Hygiene at SJMH-AA. How are we doing?

Observations / month = 30

Includes all Personnel

Limits: only a snapshot of one point in time.

% Adherence by Unit, May 2009
Hand Hygiene and Definition of HAI

Did you know that hand hygiene is one of the most effective ways to prevent the spread of many infections?

Hand hygiene is especially important in the hospital setting because your hands can transport bacteria. Patients are more likely to have an opening for an infection to get into the body, such as through a surgical wound or a tube placed in the body. National estimates suggest that about one in ten patients may become infected during their hospital stay.

**Healthcare Associated Infection (HAI)**

is defined as:

Any infection that the patient acquires or is exposed to while in the hospital.

**We must minimize the risk!**
Hand hygiene is a general term that applies to either handwashing, antiseptic handwash, alcohol-based handrub, or surgical hand hygiene/antisepsis.

- **Handwashing**
  Washing hands with plain soap and water.

- **Antiseptic handwash**
  Washing hands with water and soap or other detergents containing an antiseptic agent.

- **Alcohol-based handrub**
  Rubbing hands with an alcohol-containing preparation.

- **Surgical hand hygiene/antisepsis**
  Handwashing or using an alcohol-based handrub before operations by surgical personnel.

Hand Hygiene: Not a New Concept but Primary Intervention to Prevent HAIs

Maternal Mortality due to Postpartum Infection
General Hospital, Vienna, Austria, 1841-1850

Semmelweis' Hand Hygiene Intervention
~ Hand antisepsis reduces the frequency of patient infections ~

The Intervention: Hand scrub with a chlorinated lime solution

Hand hygiene basin at the Lying-In Women’s Hospital in Vienna, 1847.

REMARKABLE MEDICINE. REMARKABLE CARE.
Which Method Kills Bacteria Better?

Good

Plain Soap

Better

Antimicrobial soap

Best

Alcohol-based handrub
Brief Segue: Principles of Cross Transmission of Pathogens in Healthcare Facilities -

- **Panel A** (left): Culture of healthcare worker’s hand following ungloved abdominal exam of a patient with spinal cord injury – colonized in nares with methicillin-resistant *S. aureus* (MRSA)
- **Panel B** (right): Same worker’s hand after application of alcohol-based handrub (ABHR)

When Should You Use Hand Hygiene?

- When hands are visibly dirty, contaminated, or soiled, wash with antimicrobial soap and water.
- If hands are not visibly soiled, use an alcohol-based handrub for routine decontamination of hands.

**Before**
- Entering a patient’s room
- Patient contact
- Putting on gloves
- Handling food or food trays

**After**
- Contact with a patient’s skin
- Contact with environmental surfaces in patient care area
- Removing gloves
- Leaving a patient’s room

The WHO ‘5 Moments’ for Hand Hygiene” approach

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**
What Are the Benefits of Alcohol-Based Handrubs?

- Requires less time
- More effective than washing with soap
- More accessible than sinks
- Reduces bacterial counts on hands
- **Improves skin condition**
Time constraint = major obstacle for hand hygiene

- Adequate hand washing (HW) with water and soap requires 40–60 seconds from start to finish;
  - 7 times / shift = 56 min.
- Alcohol-based hand rubbing (HR): 20–30 seconds total;
  - 7 times / shift = 18 min.
- If HCW used hand hygiene for every indication in 8 hr shift:
  - HW = 16 hours!
  - HR = 5 hours

Recommended Hand Hygiene Technique

- **Handrubs**
  - Apply to palm of one hand, rub hands together covering all surfaces until dry

- **Handwashing**
  - Wet hands with water, apply soap, rub hands together for at least 15 seconds
  - Rinse and dry with disposable towel
  - Use towel to turn off faucet

Surfaces Can Transmit Infection

- VRE (Vancomycin Resistant Enterococci) as an example of a multidrug-resistant organism that is present in the environment.

- Duckro, et al. found efficient transfer of VRE from environment to healthcare workers.
  - N = 131 HCW’s hands were cultured before and after routine patient care/contact with environment.

After routine patient care 75% of ungloved hands and 9% of gloved hands were contaminated with VRE.
Surfaces can Transmit Infection

- represents positive VRE culture sites

~ Contaminated surfaces increase cross-transmission ~

16/151 (10.6%) surfaces sampled were deposited via health care worker hands

On the other hand…Be a critical thinker when you read:

- *Hospital scrubs are a deadly, germy mess* – B. McCaughey, Wall St J 01/08/09:A13

- Instead the Evidence-based Reality is:
  - “The hypothesis that uniforms/clothing could be a vehicle for the transmission of infections is **not** supported by existing evidence.”

What About Gloves?

- Wear gloves when you may have contact with blood or other potentially infectious materials
- Remove your gloves after caring for a patient
- Do not wear the same pair of gloves for the care of more than one patient
- Do not wash gloves
- Do not wear gloves in the hallway, except when transporting specimens or soiled materials
- ALWAYS perform Hand Hygiene after removing gloves!

Nails:

- Natural nail tips should be kept trimmed to ¼ inch in length

- Hospital policy and CDC recommendations are that artificial nails not be worn by those providing direct patient care
Can a Fashion Statement Harm the Patient?

Avoid wearing artificial nails, keep natural nails <1/4 inch if caring for high risk patients (ICU, OR)

Edel et. al, *Nursing Research* 1998: 47;54-59
Moisturizers and Lotions

Healthy hands and nails are an important part of any hand hygiene program.

Use hospital supplied lotion products after hand washing to assist with maintaining healthy skin.
• Hand Hygiene Saves Lives

• Hand Hygiene should be done before and after every patient contact

• Alcohol-based handrubs are the simplest, most effective and most efficient way of reducing infections
Thank you

Questions?

For more information on Hand Hygiene and current CDC or WHO Guidelines, available at:

http://www.cdc.gov/cleanhands/

http://www.who.int/gpsc/5may/tools/workplace_reminders/en/index.html