Routine Practices: Risk Assessment, Cleaning & Disinfection

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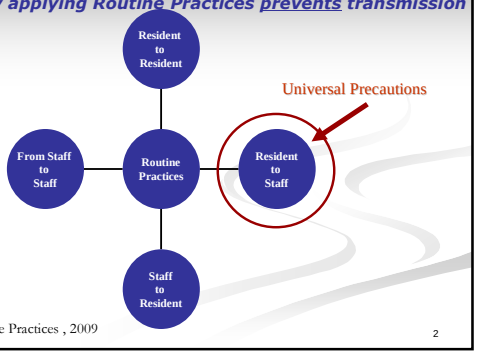
What is Routine Practices?

Consistently applying Routine Practices prevents transmission



PIDAC, Routine Practices , 2009

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Elements of Routine Practices

Routine Practices

- Risk Assessment
- Hand Hygiene
- Personal Protective Equipment (PPE)

Environmental Controls
- Room Placement
- Cleaning
- Engineering Controls
- "Point of Care"
- Access to PPE

Administrative Controls
- Policies & Procedures
- Auditing & Feedback
- Education
- Immunization Programs
- Worker Exclusion
- Respiratory Etiquette

PIDAC, Routine Practices, 2009

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Performing **Risk Assessments** is a key factor in the successful application of **Routine Practices**!

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Sometimes it's simple.....

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Sometimes it's complicated....

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Risk Assessment: Routine Practices

Performed before each interaction with residents or their environment

- What task will I be performing?
- What is my risk of exposure to blood, body fluids, excretions, secretions, non-intact skin and mucous membranes?
- How competent or experienced am I?
- How cooperative is the patient?

Personal protective equipment (PPE) is chosen based upon assessment of both task and risk

Risk Assessment

Will my hands be exposed to blood, excretions, secretions, non-intact skin or contaminated items?

If yes, WEAR GLOVES & PERFORM HAND HYGIENE

Will my face be exposed to a splash, spray, cough or sneeze?

If yes, WEAR FACIAL PROTECTION (mask & eyewear)

Will my skin/clothing be exposed to splashes or items contaminated with blood, excretions or secretions?

If yes, WEAR A GOWN

Risk Assessment: Crossing the Street

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- What's my risk of being hit by a car?
- Are there any cars coming?
- How experienced am I?
- How mobile am I?
- Is the driver going to slow down or speed up?

It's Automatic!

Risk Assessment

- It's easier to assess risk when your personal safety is involved!!
- Risk assessment is reinforced when consequences are immediate and obvious!!
- Risk assessment requires practice!!

Risk Assessments in Routine Practices prevent contamination, transmission & infection!

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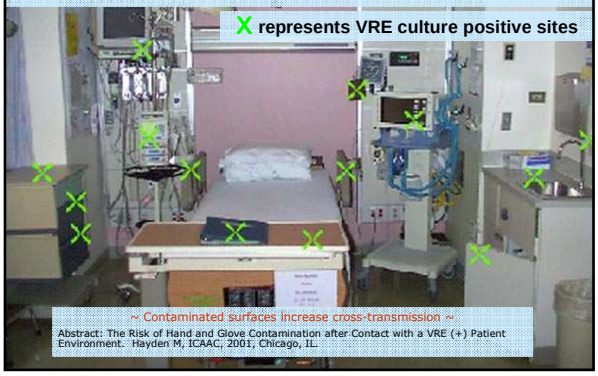
How does the environment become contaminated?

The Inanimate Environment Can Facilitate Transmission



Contamination of the Environment

- Shedding of skin cells (patient & workers)*
- Health care worker hand contamination*
- Patient contamination, hands, excretions or secretions*
- Ineffective Cleaning*
- Other sources, e.g. construction

There is increasing evidence that contaminated surfaces contribute to transmission.
Focus efforts on ↓ shedding and ↑ efficacy of cleaning

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Risk Assessment: How likely is the patient to contaminate the environment?

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- Does your patient have CSD? (Coughing, Sneezing, Diarrhea)
- Can secretions and excretions be contained?
- How co-operative is the patient?

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Concentration of Contamination

- Examples:
  - VRE on skin 10^3 CFUs/50cm^2
  - Cdiff, VRE, MRSA in stool 10^3 - 10^9 CFUs/g
  - Norovirus in stool >10^{12}CFUs/g, emesis 10^7
  - On surfaces - <1-100 CFUs/cm^2
- Infectious dose for most environmental pathogens is low, e.g. Staph aureus <15 cells, Norovirus 1 particle

The risk of VRE acquisition is the same when touching surfaces as touching patients!
Otter, et al. 2011

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Daily washing of patient/resident skin with Chlorhexidene ↓ contamination of skin, environmental surfaces & health care worker hands! This is called *"Source Control"*.

Otter, 2011

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Risk Assessment: Placement

PIDAC, Routine Practices. 2009

DOES YOUR PATIENT HAVE

- New/worse cough, shortness of breath with fever or chills?
- Copious uncontrolled secretions?
- Non-compliance with hygiene practices?
- Soiling of the environment?

If Yes → 1. ASSESS for PPE

2. ASSESS FOR ACCOMMODATION

- FIRST CHOICE: Single room
- SECOND CHOICE: Spatial separation (2 metres)

Risk Assessment: How Likely is the HCW to Contaminate the Environment or the Patient?

- Failure to perform hand hygiene
  - Overall compliance < 40%
  - ……..>60% contaminating!
- Failure to remove gloves when task completed
- Failure to stay home when sick (↑ shedding)

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Risk Assessment: How Likely is the Environment to Contaminate the Patient?

- High touch or low touch surface
- Failure to clean environment and/or equipment
- Ineffective cleaning
- Surfaces that can't be cleaned
- Physical design
- Events (construction)

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Spaulding Classification: Patient Care Equipment

Items classified based upon risk of infection

- Critical items
- Semi-critical items
- Non-critical items

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Non-critical patient care objects

Contact with intact skin

Method	Objective	Examples
Cleaning followed by Low Level Disinfection	Kills vegetative bacteria, fungi, lipid viruses	Bedpans, crutches, bed rails, environmental surfaces, EKG leads, stethoscopes

Pictures removed

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Cleaning or Disinfection?

- Cleaning: physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms).
  - Requires *water, detergents* and *mechanical action.*
- Disinfection: inactivation of disease producing organisms
  - Requires cleaning and *disinfectant product*
  - Required for *high touch surfaces & non-critical patient equipment*

PIDAC, Environmental Cleaning, 2009 22

High & Low Touch Surfaces

- **High-Touch Surfaces:** Surfaces that have frequent contact with hands.
  - Examples: doorknobs, call bells, bedrails, light switches, wall areas around the toilet, privacy curtains.
- **Low-Touch Surfaces:** Surfaces that have minimal contact with hands.
  - Examples: walls, ceilings, mirrors and window sills.

PIDAC, Environmental Cleaning, 2009 23

Frequency of Environmental Contamination Patient Rooms & MRSA

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Percent of Surfaces Contaminated

Hand Hygiene Resource Center Hospital of Saint Raphael New Haven, CT
http://www.handhygiene.org/educational_tools.asp

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Adding one additional cleaning staff to focus on high touch surfaces, ↓ contamination & ↓ transmission of MRSA to patients.

Otter et al. 2011

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Level of cleaning is based on risk of contamination & transmission

Hotel Clean
Areas where care *is not* provided

Hospital Clean
Areas where care *is* provided

Low ← Risk → High

PIDAC, environmental Cleaning, 2009

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Hotel Clean

Basic cleaning

based on visual appearance

BOX 3: Components of 'Hotel Clean'

- Floors and baseboards are free of stains, visible dust, spills and streaks
- Walls, ceilings and doors are free of visible dust, gross soil, streaks, spider webs and handprints
- All horizontal surfaces are free of visible dust or streaks (includes furniture, window ledges, overhead lights, phones, picture frames, carpets etc.)
- Bathroom fixtures including toilets, sinks, tubs and showers are free of streaks, soil, stains and soap scum
- Mirrors and windows are free of dust and streaks
- Dispensers are free of dust, soiling and residue and replaced/replenished when empty
- Appliances are free of dust, soiling and stains
- Waste is disposed of appropriately
- Items that are broken, torn, cracked or malfunctioning are replaced

Public areas receive "hotel clean"

PIDAC, Environmental Cleaning. 2009

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Hospital Clean

Requires auditing

BOX 4: Components of 'Hospital Clean'

Hospital Clean consists of:

HOTEL CLEAN
+

High-touch surfaces in client/patient/resident care areas are cleaned and disinfected with a hospital-grade disinfectant
Non-critical medical equipment is cleaned and disinfected between clients/patients/residents

+

CLEANING PRACTICES ARE PERIODICALLY MONITORED AND AUDITED WITH FEEDBACK AND EDUCATION

Patient areas receive "hospital clean"

PIDAC, Environmental Cleaning. 2009

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Frequency of Cleaning

Regular schedules must be established!

Schedules are determined by assessment of the following:

1. Whether surface is high touch or low touch
2. Type of activity and risk of infection in area
3. Vulnerability of patients/residents
4. Probability of contamination

- Daily cleaning of patient/resident rooms & high touch surfaces
- Sample procedures outlined in PIDAC, 2009 document
- Patient care equipment – between patient use

PIDAC, Environmental Cleaning, 2009

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Efficacy of Cleaning

Choosing a disinfectant

- Must have DIN #
- What will it be used on?
- What are the likely organisms?
- How soiled is the surface?
- Type and concentration of product
- Contact time of product
- Occupational health consideration
- Environmental friendliness

PIDAC, Environmental Cleaning, 2009

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Product or Practice?

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Surfaces in Health Care Settings

- You can't thoroughly clean non-intact surfaces
- Fabrics must be fluid-resistant and non-porous
- Wood surfaces and those with seams are not recommended
- Use removable and washable covers if possible
- "Plastic coverings (e.g. mattress covers) must not be cleaned with products that will render the covering permeable to fluids (e.g. phenolics, accelerated hydrogen peroxide)" PIDAC, 2009

PIDAC, Environmental Cleaning, 2009

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Hard to Clean

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Shared Equipment, Whose Job is it?

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Cleanliness of Portable Equipment

- Prospective study 500 bed teaching hospital
- Sampled 101 rolling BP units using ATP bioluminescence (300 samples – control buttons, BP cuff, thermometer, machine handle, pulse oximeter).

Site sampled	Median RLU value (range)	Percent <250 RLU value
Control buttons (n = 58)	86 (14-1532)	76
Thermometer (n = 44)	346 (23-5340)	39
Blood pressure cuff (n = 79)	477 (42-31,877)	24
Machine handle (n = 54)	480 (42-31,877)	24
Pulse oximeter (n = 65)	1208 (59-27,297)	22

< 250 RLUs considered clean

Education & monitoring of nurses is required

Havill, et al. Amer. Journ Infect Control. 2011

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Risk of acquiring VRE, MRSA & C *difficile* is ↑ when prior room occupants have been positive.
Otter et al. 2011

Ineffective Cleaning?

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Auditing Cleaning Practices

If it can't be measured, it can't be improved!

- Direct Observation
  - Checklist, visual cleanliness
- Indirect Observation
  - Survey of other staff, residents or family members perceptions
- Measurement
  - Environmental cultures
  - Detection of ATP
  - Marker solution

Auditing requires feedback, analysis and education!
Otter et al. 2011

Feedback & Education ↑ efficacy & ↓ transmission
Otter et al. 2011

PIDAC, Environmental Cleaning, 2009

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What's New? Cleaning Practices

- Change gloves between *each* patient environment
- Fresh solutions and cleaning cloths for *each* patient environment.
- There is evidence that cleaning cloths can spread organisms.

No Double Dipping!

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Risk Associated with Design

Design to Improve Cleaning

- Design better equipment & furniture

http://www.designcouncil.org.uk/designbugsout

- New technology to remove human error (hydrogen peroxide vapour, UV radiation)
- More efficient products e.g. microfiber cloths, mops
- Facilities with single patient rooms

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Multi-resistant Pseudomonas outbreak associated with ICU design (Toronto)

- Dec. 2004-March 2006
- 36 infected patients (ICU, transplant unit)
- 17/36 (47%) died within 3 months
- 12/17 (71%), outbreak strain contributed to or caused death
- Organism traced to splashing from contaminated sinks

Hota, S, et. al. (2009). Infection Control & Hosp. Epid. 30, 25-33

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Pictures removed

Hota, S, et. al. (2009). Infection Control & Hosp. Epid. 30, 25-33.

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Pictures removed

Hota, S, et. al. (2009). Infection Control & Hosp. Epid. 30, 25-33.

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Routine Practices Creating Habits:
Assess Risks for Cleaning & Disinfection

Habits are things you do without thinking

Three steps in the development of habits:

1. Clearly define expected behaviour
2. Establish triggers
3. Repetition
   - Daily action or multiple times per day will require 2-3 weeks of repetition
   - Weekly action can require up to 12 weeks of repetition

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Failed Risk Assessments Contribute to Poor Outcomes

- 250,000 pts./year (I in 6) develop Healthcare Associated Infections (HAIs) in Canada
- 8,000 will die as a result of these infections

McGeer, A., (2007). Hand hygiene by habit. *Ontario Medical Review* 74 *(10)*

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References

Havill, N., Havill, H., Mangione, E., Dumigan, D., Boyce, J., (2011). Cleanliness of portable medical equipment disinfected by nursing staff. *American Journal of Infection Control, 39,* 602-4.

Hota, S, et. al. (2009). Multi-resistant Pseudomonas outbreak associated with ICU design. *Infection Control & Hospital Epidemiology, 30,* 25-33.

McGeer, A., (2007). Hand hygiene by habit. *Ontario Medical Review* 74 *(10)*

Ontario. Ministry of Health and Long Term Care. Provincial Infectious Diseases Advisory Committee. *Best Practices for Environmental Cleaning, for Prevention and Control of Infections in All Health Care Settings.* 2009.

Ontario. Ministry of Health and Long Term Care. Provincial Infectious Diseases Advisory Committee. *Routine Practices and Additional Precautions in All Health Care Settings.* 2009.

Otter, J., Yezli, S., French, G., (2011). The role played by contaminated surfaces in the transmission of nosocomial pathogens. *Infection Control and Hospital Epidemiology, 32*(7), 687-699.

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