Bedpan Decontamination - Manual vs. Mechanical
Gertie van Knippenberg-Gordebeke
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Is there a risk for a Healthcare Associated Infection from Handling Urine bottle & Bedpan (Human waste containers) ?


• 55,300 / 160 Bedpan & infections
• 1,570 / 27 Bedpan & nosocomial infections
• 39,400 / 25 Bedpan & hospital assoc. infections
• 3,700 / 103 Bedpan & healthcare assoc. infections

GOOGLE ENGLISH / DUTCH
• 55,300 / 160 Bedpan & infections
• 1,570 / 27 Bedpan & nosocomial infections
• 39,400 / 25 Bedpan & hospital assoc. infections
• 3,700 / 103 Bedpan & healthcare assoc. infections

PUBMED ENGLISH
• 16 Bedpan & infections
• 12 Bedpan & nosocomial infections
• 1 Bedpan & hospital assoc. infections
• 0 Bedpan & healthcare assoc. infections

Healthcare-Associated Infections Gastrointestinal Infections 5%

USA 1990-1997

the Netherlands Prevalence HAI March 2007

Healthcare-Associated Infections

These Outbreaks are NEWS!

BUT...
More Victims from Healthcare-Associated Infections (HAI) Millions of Patients each year!

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Antimicrobial exposure is major risk factor for disease

- Acquisition & growth of *C. difficile*
- Suppression of normal flora of the colon

Transmission faecal-oral

- Hands of healthcare personnel
- Environmental contamination by this microorganism is well known, especially in places where faecal contamination may occur

**Clostridium difficile-associated disease (CDAD)**

- Diarrhoea
- Pseudo-membranous colitis
- Toxic mega colon
- Sepsis
- Death

**Clostridium difficile**

- Increase in the USA: 82,000 in 1996, 178,000 in 2003
- June 2005 first outbreaks in Dutch Hospitals & Nursing homes
- *Clostridium difficile* PCR-ribotype 027 wins ground, but epidemics are limited
- RIVM, August 2007

**HAI must be minimized**

Prevention through Better Hygiene & Infection Prevention Measures

- Primum Non Nocere ‘Do No Harm’
  - Accreditation
  - Education & Training
  - Guidelines & Protocols
  - ‘Evidence Based’ & ‘Best Practice’
  - Patient Safety

- Is the message clear and for the right audience (nurses, physicians from the bedside)?
- Frequency education?
- How is the climate in the institute?
- Do we all follow the same theory?
- How is Practice?

- Lack of knowledge
- Lack of equipment
- Aging equipment
- Deferred maintenance
- Limited resources/budget
- Lack of interest of authorities
- Antimicrobial resistance
- Staff shortage
- Human behaviour
Chain of infection

Infection-prevention & -control strategies must be based on the principles of breaking the “chain of infection”

1st Hand hygiene

- Avoid contaminating hands with soil
- Minimize handling as much as possible
- Education on procedures
- Education on the proper use of barriers

Hand hygiene

- Safer patient care
- 100% performance
- Zero tolerance!

Hand hygiene

- Alcoholic hand rub is the most safe method
- Alcoholic hand rub at EVERY BEDSITE
- Gloves should only be worn for specific tasks
- Continuous education
- Regular audit

Countries committed to Clean Care


Cleaning Practice 2008

Healthcare Institutes are Not Clean

- Understaffing
- Difficult designed buildings
- Budget (priorities mostly not for cleaning)
- Acceptance & Resignation in current situation
- Difficult to clean Furniture, Floor covering, mattresses, pillows & nursing equipment
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### Contamination Risk Environment

- Micro-organisms are ubiquitous in the environment
- Contamination by people shedding organisms
- Contamination by soilage with body secretions
- Seldom the source responsible for direct transmission
  - Secondary transmission may occur from contaminated area, equipment and utensils
- Transmission by contaminated Hands direct & indirect

### Environmental contamination

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### Contaminated equipment can transmit infections to Patients & HCWs

- Careful cleaning a must before disinfection & sterilization
- Important task done by trained individuals
- Heat disinfection & Sterilization only with validated methods & processes

**Failure to properly disinfect or sterilize carries a risk of infection**

### Enteric Precautions Anno 1489

- *Reservoir*

### Enteric Precautions Anno 2008

- *Transmission Risk?*

### Healthcare settings Clean & Safe?

- Plenty Transmission routes
- Risky procedures
- Reservoirs
- Cleaning & decontamination methods:
  - carried out by not well trained HCWs
  - no regular procedures
  - Environmental contamination

---

Woodcutting, Germany
Enteric Precautions
Anno 1489

Transmission Risk?
Human Gut Flora
± 1,000,000,000 micro organisms

Basic Precautions in Healthcare

Every Patient must be treated as Colonised or as Infectious

1. Handhygiene
2. Personal Hygiene & Clean Uniforms
3. Cleaning and Disinfection
4. A-septic technique
5. Laundry Handling
6. Careful Human Waste handling

Patient (Human) Waste

Patients produce Faeces, Urine (and Pathogens)

24 hours per day
- Per person 100 – 250 gram Faeces per day
- Diarrhoea: 15 or more times per day
- 70-75% is water
- 30% of solid remaining is bacteria

Handling Urine & Faeces

1. Pharmaceutical waste
2. Sharps
3. Radioactive waste
4. Genotoxic waste
5. Chemical waste
6. Pathological waste
7. Infectious waste

Some Infectious Agents

- Clostridium difficile
- E. coli (O157 H7)
- Hepatitis A
- Klebsiella pneumonia
- Noro virus
- Proteus species
- Serratia species
- Salmonella species
- Multi Drug Resistant Organisms (MDRO)
- Staphylococcus species (MRSA)
- Vancomycin Resistant Enterococci (VRE)

WHO

Categories of Health Care Waste

1. Pharmaceutical waste
2. Sharps
3. Radioactive waste
4. Genotoxic waste
5. Chemical waste
6. Pathological waste
7. Infectious waste

Suspected to contain pathogens, from isolation wards, materials or equipment that have been in contact with:
- infected patients
- excreta contaminated with potentially infectious fluids or blood

How do we recognize infected patients?

Some pathogens can survive Months on Dry Surfaces
- Gram negative bacteria generally require Moist Environment

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Clostridium difficile in Environment

- Bedpan
- Bed rails
- Blood pressure cuff
- Common toilets
- Dirty Utility Rooms
- Dispenser
- Floors
- Healthcare Worker Shoes
- Paper towel

- Portable toilets
- Slob-Hopper
- Steam flusher
- Table top
- Toilet bowl
- Toilet seat
- Waste-container
- Washroom floor

Decontamination

- A process that reduces the number of pathogenic microorganisms from inanimate objects or skin to a level which is not harmful to health
  - Cleaning, Disinfection & Sterilisation

Low risk Decontamination

- Items in contact with normal & intact skin
- The inanimate environment not in contact with the patient, (e.g. walls, floors, ceilings, furniture, sinks & drains)
- bedpan?

The choice of the method involved

- Risk of infection to patients
- Risk of infection to staff
- Risk to environment
- Risk of damaging the utensils
- Budget

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### Manual Cleaning

- Removes organic soil / visible soil
- Removes potentially infectious microorganisms
- Removes soil which protects m.o. during disinfection

**Careful cleaning**

- Mechanical energy
- Chemical products
- Right Method

- friction, flushing, scrubbing
- detergents or enzymes
- manual & machinal

---

### Machinal Cleaning

**NO SAFE Procedure!**

- Everybody is an "EXPERT"
- Difficult to monitor
- Responsibilities not clear
- Health-risk

**Machinal Cleaning is Safer**

- Common in Households
- Not Common in Healthcare settings
- Easy to use
- Standardization & Validation
- Better Result
- Saves Nursing Time
- Thermal Disinfection

---

### Decontamination

- A process that reduces the number of pathogenic microorganisms from inanimate objects or skin to a level which is not harmful to health

  - Cleaning
  - Disinfection
  - Sterilisation

### Disinfection Methods

- **Heat** Disinfection
- **Chemical** Disinfection

The choice of the method involves:

- the risk of infection to patients
- the risk of infection to staff
- the risk of environment
- the risk of damaging the utensils

*Disinfection Reduces pathogens, but not all spores*

---

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Need for Cleaning before Disinfection

- The presence of organic material impedes decontamination by providing protection for microorganisms.
- In addition, these decontamination processes may damage equipment by fixing protein residues to their surfaces.
- For these reasons, thorough cleaning of used equipment before disinfection is essential.

Thermal disinfection is preferred

- Mostly mechanical
- Is more easily controlled
- Generally more reliable than chemicals
- Leaves no residues
- More easily controlled
- Non-toxic

- Kills most bacteria (but not all spores)

Regular Chemical Disinfection?

- Frequency
- Methods & Choice
- Health & Environmental Risk possible
- Time consuming procedure
- Expensive
- Effective?
- False ‘Safety’ Feeling
- Abuse Disinfectants

NOT a SAFE Procedure!

Protect the HCW from exposure to potentially infectious materials

- Use of personal protective equipment
- Proper work practices
- Containment
- Hazard communication
- Ergonomics

IGZ (Health Care Inspectorate) the Netherlands, Den Haag, January 2007

Survey current legislation covering disinfectant agents and their use all hospitals

- The most appropriate disinfectants
- In the most appropriate way
- In order to ensure the safety of patients and staff

- Most hospitals use disinfectant agents sparingly, in line with the guidelines issued by the Dutch Working Party on Infection Prevention (WIP) www.wip.nl
- The implementation of that policy lacks structured procedures

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Flushing Sink & Bedpan-cleaners
- Still in use
- Only rinses
- No disinfection
Huge Contamination Risk through
Splash, Contact, Aerosol, Droplets

Consequence of Microbial Growth
- Odors
- Stains
- Deterioration
- Biofilms
- Financial lost
- Functional time lost
- Life of material lost
- Risk for transmission

Daily Practice
- Risk Healthcare worker
  - Hands
  - Eyes
  - Uniforms
- Risk Environment
  - Floors
  - Walls
  - Clean items
  - Surfaces

Survival of MRSA in Hospital Environment
Staphylococci recovered
for 1 - 56 days after contamination

Survival of MRSA in Hospital Environment
Staphylococci recovered
for 1 - 56 days after contamination

INFECTION PREVENTION
Give micro-organisms
■ NO Chance to Grow
■ NO Chance to spread / transport
Keep Clean & Dry

Environment in Healthcare
Clean & Dry?

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Guidelines for Environmental Infection Control in Health-Care Facilities: CDC 2003 (249 pages)

Adherence to:
- proper use of disinfectants,
- proper maintenance of medical equipment that uses water (e.g., automated endoscope re-processors and hydrotherapy equipment)
- water-quality standards for haemodialysis
- proper ventilation standards for specialized care environments (i.e., airborne infection isolation, protective environment and operating rooms)
- prompt management of water intrusion into facility structural elements

Will minimize HAI risks and reduce the frequency of pseudo-outbreaks
www.cdc.gov/ncidod/dphc/gf_envirioninfection.html

Washer-disinfectors ISO/FDIS 15883-3
Part 3: Requirements and tests for washer disinfectors

For human waste containers
- emptying
- flushing
- cleaning
- thermally disinfecting
- rinsing and
- drying

Intended for re-use such as:
- portable sanitary pans
- supports for single-use bed pans
- urine bottles
- suction bottles
- products similar to the above and used for similar purposes

ISO/FDIS 15883-3 Washer-disinfectors (WD)—Part 3:
- Where equipment does not provide automatic emptying facilities, extra care is needed by the user to avoid exposure to human waste and contamination of the work environment including the generation of aerosols.
- Empty human waste containers automatically

Washer Disinfectors
- Better results than manual reprocessing
- Thermal Disinfection
- Standardization
- Validation
- Protects the HCW from exposure
- Expensive (?)

Contributes substantially to the overall prevention of MRSA, Clostridium difficile, and MDRO transmission
A Must on Every Ward

H A C C P
HACCP principles incorporated into Food Safety Legislation in USA & Europe
NASA - American Space Program - 1960

Hazard
- Analysis of potential Hazards in the current process & possible preventive measures

Analysis
- Identification of Critical Control Points in the Process

Critical
- Establish Critical limits
- Introduce Monitoring requirements and procedures

Control
- Determine Corrective Actions
- Record Keeping Procedures

Points

HACCP WD
The Maintenance of Correct Parameters to ensure SAFE Cleaning & Disinfection
- Water
- Temperature
- Duration time
- Loading
- Written record of maintenance must be kept
- Visual Inspection & Audit

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Audit Regular
- Smell cleaned items
- Microbial check?
- Visual Check
  - No faeces rest
  - No urine rest
  - No ointments
  - No discoloration
  - No Lime scale

Audit Regular
- Minimal once a year every ward
- Outbreaks
- Checklist
- Loading procedures
- Maintenance

Who is Responsible?

Cleaning & Maintenance
Who  When  How

Check Validation & Maintenance

Loading
Important part in cleaning process

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Storage Clean & Dry
Protection against Recontamination

Macerators
• Can be useful
• Not used in the Netherlands
• No personal experience
• Huge storage disposable bedpans & urinals
• Delay in delivery
• No covered (lit) bedpans
• Costs?

Is THIS Acceptable?

Less danger as “dirty” bedpans !

Optimize Cleaning & Disinfection

the Mind wants change,
the Head wants progression,
and the Heart wants to keep what it got

Prof. dr. Andreas Voss

• I do not Know how  →  Education
• I do not have the facility  →  System change
• I do (will/) not do it  →  Motivation

Education
Regular Education & Training
- To all HCW’s handling bedpans
- To Cleaning staff handling bedpans
- The chain of infection & preventive measures
- Hand hygiene
- Avoid contaminating hands & minimize handling

Motivation
- Integrate Infection Prevention in Patient Safety Department
- WD safer for patients & HCWs
- Saves time
- Nurses have to realize their specific role in preventing HAI
- Nurses can play an important roll in demanding for WD
- Cooperation Healthcare & Industry

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System change
- Practical & payable approach for decontamination bedpans
- HACCP Cleaning & Disinfection Procedures
- Restriction Disinfectants & thermal disinfection if possible
- Managers must consider WD on each ward as part of Infection prevention/ Safety program

Budget for Bedpan Washers
Bedpanwashers are not on the budget priority list
DEMAND FOR IT!
- First they ignore you
- Then they laugh at you
- Then they fight you
- Then you win!
  Mahatma Gandhi, India, 1869-1948

Decontamination Human Waste Containers Manual vs. Mechanical (1)

<table>
<thead>
<tr>
<th>Contamination Risk</th>
<th>Manual Environment &amp; Hands</th>
<th>Machinal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emptying</td>
<td>By hands</td>
<td>Automatically</td>
</tr>
<tr>
<td>Cleaning</td>
<td>By hands</td>
<td>Automatically</td>
</tr>
<tr>
<td>Flushing</td>
<td>Manual</td>
<td>Automatically</td>
</tr>
<tr>
<td>Detergent dosage</td>
<td>Uncontrolled</td>
<td>Controlled</td>
</tr>
<tr>
<td>Disinfection</td>
<td>Risk disinfectant use</td>
<td>Thermal</td>
</tr>
</tbody>
</table>

Decontamination Human Waste Containers Manual vs. Mechanical (2)

<table>
<thead>
<tr>
<th>Contamination Risk</th>
<th>Manual Environment &amp; Hands</th>
<th>Machinal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemotherapeutic</td>
<td>Risk for contamination</td>
<td>No Risk</td>
</tr>
<tr>
<td>agent residuals</td>
<td>(Dirty Towel)</td>
<td>Automatically</td>
</tr>
<tr>
<td>Drying</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Validation</td>
<td>No</td>
<td>Safe</td>
</tr>
<tr>
<td>Procedure</td>
<td>Not so Safe</td>
<td>Safe</td>
</tr>
<tr>
<td>Costs</td>
<td>Cheap</td>
<td>More expensive</td>
</tr>
</tbody>
</table>

Safe Handling Human Waste at any patient at any time
Even lacking resources, if one focuses on the risks HAI a safe and effective program can still be achieved

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Thank You

References
- Basic Concepts of Infection Control. IFIC (International Federation of Infection Control), 2007, www.theIFIC.org
- INTERNATIONAL STANDARD ISO/FDIS 15883, 2006, Washer-disinfectors
- Rutala WA and Webber DJ. Cleaning, Disinfection and Sterilization in Healthcare Facilities. APIC Text of Infection Control & Epidemiology, 2nd ed, 2005
- Rutala WA and Webber DJ. Cleaning, Disinfection and Sterilization in Healthcare Facilities. APIC Text of Infection Control & Epidemiology, 2nd ed, 2005

The Next Few Teleclasses

19 Jul, 08
Environmental Design - Methodology and Strategies
Speaker: Dr. Yvonne Wilson, CDC

25 Jun, 08
Outbreaks: Tennessee/Pennslyvania Line Source
Speaker: Dr. Steve McAnnie, National Center for Health Security

26 Jul, 08
CBC Verification - The QC Examination Process: Computer einer Testing
Speaker: CBC Board Members & Guests

17 Jul, 09
What’s Not
Speaker: Dr. Rachel Gordon, CDC

22 Jul, 09
The British Telehealth Progress Report from the Chief Nursing Officer (CNO)
Speaker: Christine Beebe, British Department of Health

24 Jul, 09
Patient Cleansing, Distribution & Storag: current Issues & New Research
Speaker: Dr. William Rubas, University of North Carolina

14 Aug, 09
Free South Pacific Telehealth Live Broadcast from the NLCH Conference Melbourne, New Zealand
Speaker: To be announced

04 Sep, 09
Do the Infection Control Right - How to Cleanse the Wound

www.webbertraining.com/schedulep1.php

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