Going Green While Keeping Clean
Ed Rubinstein, University Health Network, Toronto
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Presentation Outline
Collaborations, Challenges, Lessons Learned and Myths

- Designing a Clean & Green Hospital
  - Make it easy to clean
  - Make it energy efficient
  - Make it water efficient

- Operating a Clean & Green Hospital
  - Reduce
  - Reuse
  - Recycle

- Creating a Clean & Green Culture

Designing A Clean & Green Hospital

Make It Easy To Clean Collaboration

An easy to clean hospital means...

- clean
  - fewer places for pathogens to live

- green
  - less water
  - less cleaning chemicals

Make It Easy To Clean Challenge

Great design vs. easy to clean

Make It Easy To Clean Challenge

How do you make a hospital that doesn’t look like a hospital?

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Great design vs. easy to clean

Not so great design vs. easy to clean

Choose the right materials for the right location

<table>
<thead>
<tr>
<th>Patient Areas</th>
<th>Non-Patient Areas</th>
<th>Your House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloth upholstery</td>
<td>O</td>
<td>?</td>
</tr>
<tr>
<td>Leather</td>
<td>O</td>
<td>?</td>
</tr>
<tr>
<td>Wood floors</td>
<td>O</td>
<td>?</td>
</tr>
<tr>
<td>Carpet</td>
<td>O</td>
<td>?</td>
</tr>
<tr>
<td>Ceramic tiles</td>
<td>O</td>
<td>?</td>
</tr>
</tbody>
</table>

Choose the right materials for the right location

- Things to keep in mind
  - Activities taking place in the area
  - Patient care vs. administrative areas
  - Cleaning products that may be used
  - Potential for heavy traffic

Myth

- Natural flooring materials (e.g., linoleum) create a mould risk

Reality

- Damp conditions cause mould
- Proper installation, cleaning and maintenance of any floor is key

Myth

- Antibacterial treatment and coatings are important factors when evaluating materials

Reality

- Antibacterial claims often need to be validated
- Treatments and coatings unlikely to last throughout the product’s lifetime
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- Make It Easy To Clean  
Lesson Learned

Flooring

<table>
<thead>
<tr>
<th>VS</th>
<th>tiles</th>
<th>sheet</th>
</tr>
</thead>
</table>

- have cracks that can catch dirt and water  
- easy to repair  
- not advised for patient care areas

- Look for “wax-less” flooring options.

- Make It Easy To Clean  
Challenge

PVC - When Clean & Green Diverge...

- clean  
  - easy to clean  
  - inexpensive  
  - versatile  
  - easy to work with

- not green  
  “PVC (polyvinyl chloride or vinyl) is the worst plastic from an environmental health perspective…”  
  -Healthy Building Network

- Make It Energy Efficient  
Collaboration

Heat recovery  
- Before exhausting air from the hospital, recover some of the heating, cooling and/or humidity that was added to it

- HVAC - When Clean & Green Diverge...

- clean  
  - high number of air changes  
  - 100% outside air sometimes required

- green  
  - minimize air changes  
  - re-circulate air

- Heat recovery – heat wheels

INSIDE
conditional stale air

OUTSIDE
conditional fresh air

unconditioned fresh air

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 Myth  
• There is potential for cross contamination between fresh and stale air streams in heat wheels

 Reality  
• Heat wheels are already in common use in hospitals; allowed by CSA standards
• Most often used in applications with high fresh air intakes
• Likely would not use heat wheels for negative pressure isolation rooms

Heat recovery – coil loop recovery  
• Uses a loop of liquid to transfer heat between fresh air and exhaust
• Prevents cross contamination between air streams
• Not as efficient as a heat wheel

Displacement ventilation  
“old fashioned” overhead ventilation  
 vs.  
 displacement ventilation

• May allow for fewer air exchanges without sacrificing infection control
• Early results are promising
• Healthcare Ventilation Research Collaborative conducting further research

“Displacement ventilation at 4 air changes per hour provides better particle control, ventilation effectiveness and thermal comfort than overhead ventilation at 6 air changes per hour.”

 Hands free sinks  
• fewer hands touching the same thing  
• not relying on hands to turn sinks off

Look for self charging hands free faucets.
**Reduce Biomedical Waste**

**Myth**
- All isolation room waste needs to be disposed of as biomedical waste

**Reality**
- While all isolation room waste needs to be contained to prevent spread of infection, most does not require special disposal

**Reduce Toxic Chemical Use**

**Myth**
- Everything in a hospital needs to be disinfected

**Reality**
- Only some hospital areas need to be disinfected

**Reduce Biomedical Waste**

**Collaboration**
- Joint education from Infection Control and Environmental Services
  - appropriate handling of waste required within hospital
  - e.g., MRSA, VRE, C. difficile isolation room waste can be disposed of as general waste (if not grossly soiled)
  - *Handling of waste materials in health care facilities and veterinary health care facilities (CSA Z317.10-09)*
  - check local requirements!

**Reduce Toxic Chemical Use**

**Collaboration**
- Joint assessment between Infection Control and Environmental Services to determine when cleaning is needed and when disinfecting is required
  - good housekeeping practices can ensure disinfection is effective without unnecessary use of harsh chemicals
  - many cleaning products – whether conventional or “green” – have little or no impact on infection control

**Lessons Learned**

- May be paying a premium for disinfecting chemicals when only “regular” cleaning products will suffice
- *Ten Step Guide to Green Cleaning Implementation (Practice Greenhealth)*
  - www.h2e-online.org/docs/h2e10stepgreenlean-r5.pdf

**Future Collaboration?**
- new Ecologo certification for hand sanitizers
  - standard CCD-170
  - less harmful raw materials
  - products should include “biobased” content
  - recyclability of packaging
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Reduce
Toxic Chemical Use and Water Use

Future Collaboration?
• microfibre mops
  - synthetic, ultrafine fibres
  - nature of fibre means mops require less water and chemical than traditional mops
  - claims of reduced bacteria through use of microfibre still being validated

Reduce
Waste and Energy

Future Collaboration?
• “next generation” hand dryers
  - reduces need for paper towels in washrooms
  - use less energy than warm air hand dryers; water is pushed off of hands
  - hygiene claims still need to be validated

Reduce
Energy Use

Collaboration – HVAC Scheduling
• Turning off the fans when the room is empty
  - minimum air changes for critical areas (e.g., ORs, PACU, etc.) set by CSA
  - Special Requirements for Heating, Ventilation, and Air Conditioning (HVAC) Systems in Health Care Facilities (CAN/CSA-Z317.2-10)

Reduce
Energy Use

Collaboration – Filter Changes
• A preventative maintenance program to ensure that HVAC filters are regularly changed
  - ensures air quality is maintained
  - reduces inefficiencies from clogged filters

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**Reuse**
Single Use Devices

**Collaboration**
- Third party reprocessing of devices is available
  - reprocessor provides validation and assumes liability for reprocessed devices
  - usually only cost effective for expensive pieces of equipment or supplies

**Recycle**
In A Hospital

**Myth**
- All hospital waste is infectious

**Reality**
- While all waste should be handled using “routine precautions”, only a small amount of waste requires special disposal

**Lesson Learned**
- Proactive and ongoing education, both inside and outside of the hospital, is key
- Ensure a good understanding of legal and local requirements

**Recycle**
Cans and Bottles

**Myth**
- Cans & bottles recycling bins attract bugs

**Reality**
- Sorting waste into different containers will not attract more bugs

**Lessons Learned**
- Garbage can attract bugs, regardless of how or where it’s collected…it doesn’t matter if those cans & bottles are recycled or thrown out
  - Good housekeeping keeps bugs away; regular pick-up of waste is key
  - Line “cans & bottles” bins with clear bags that will allow waste to be identified, but prevent spillage of liquids.

**Recycle**
In Sensitive Areas

**Myth**
- Recycling cannot be done in sensitive areas such as the OR or ICUs

**Reality**
- Sorting waste into different containers does not increase infection risks

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How do we get staff to do what they already know they should be doing?

**clean**
- hand washing

**green**
- turning off lights, recycling, etc.

**Creating A Clean & Green Culture - Challenge**

Talk, listen and learn...

**clean**
- learn what your hospital’s green goals are
- don’t pretend that you know what your hospital’s green goals are

**green**
- learn what your hospital’s clean goals are
- don’t pretend that you know what your hospital’s clean goals are

**Creating A Clean & Green Culture - Collaboration**

**Special Clean & Green Thank You**

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**Thank You**

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