Green Care is Safer Care

Prof. Ossama Rasslan

President, ESIC (APIC/EGYPT Chapter)

President, EPSA

Dean, AICPD

15th Annual Patient Safety Congress, Dubai, 24 – 26 October 2019

The Emergence of Green Cleaning

- Definition:
  - *…"**products** or **services** that have a lesser or reduced effect on human health and environment , when compared with competing products or services that serve the same purpose."*
  - Expansion to address the IPC efficacy: *"toward effective products with the fewest adverse effects on human health and the environment."* Patti Costello

Why Go Green?

1. **Because of adverse Health Impacts from cleaning/disinfection**
2. **For** cleaning in HCFs, we have to reduce human health effects and environmental impacts.
3. **Hospitals** use a host of different kinds of chemicals in the cleaning process. Chemicals typically found in these products can cause :

- Headaches
- Asthma
- Burns
- Permanent eye damage
- Major organ damage
- Cancer
- Sensitization

Potential Chemicals of Concern

- 2-Butoxyethanol: (2-BE)
  - sensory irritation
- Quaternary Ammonia compounds: (Quats)
  - Allergy promoting effects
  - Some relationship to asthma
- Glutraldehyde, Formaldehyde
  - Sensitizer
- Mono-ethanolamine:
  - Can irritate the nose, throat, and lungs, causing coughing, wheezing and shortness of breath
  - Related to occupational asthma

- Sodium Hypochlorite:
  - Acute eye exposure may cause pain, lacrimation and photophobia
  - Chronic skin exposure may cause irritation, inflammation and blisters

- 401 work-related illness associated with disinfectants / steriliants
- The most frequent occupations reported were ES professionals and nursing/medical assistants.
- Splash/spill to the eye are the most common .

Beyond the Healthcare Facility: Environmental Impacts of cleaning & disinfection chemicals are :

1. Negative impact on indoor & outdoor air quality

2. Bioaccumulation in plants and animals; e.g.:
   - Endocrine disruptors in wildlife.
   - Disinfectants and antiseptics can select for microbial resistance?

3. Quality of potable water

Facility Cleaning Plan

- **Base-line assessment for cleaning process in different hospital areas .**
- **Different strategies for different areas.**
- **Infection Preventionists can determine what level of cleaning and disinfection needs to happen in different areas of the hospital.**
- **Use Facility-specific risk assessment process.**

Going Green While Keeping Clean

- **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

An easy to clean hospital means…

clean

- fewer places for pathogens to live

and

green

- less water
- less cleaning chemicals

Make It Easy To Clean

Great design vs. not easy to clean….!

source: www.treehugger.com

Make It Easy To Clean

Not so great design vs. easy to clean

vs.

Make It Easy To Clean

Choose the right materials for the right location

	patient areas	non-patient areas	your house
leather	x	?	✓
wood floors	x	?	✓
carpet	x	?	✓
ceramic tiles	x	?	✓

Make It Easy To Clean

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

Make It Easy To Clean

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 the key

Make It Easy To Clean

Flooring

tiles	*vs.*	**sheet**

Make It Easy To Clean

Flooring

tiles

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

vs.

sheet

- seams can be sealed
- can have cove (rounded) base at wall for easier cleaning

Make It Easy To Clean

PVC (polyvinyl chloride or vinyl)- When Clean & Green Diverge...

clean

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

vs.

***not* green**

"PVC is the worst plastic from an environmental health perspective..."

Can we go towards Green cleaners?.....Sure.

In light of health effects on workers and the environment, healthcare looks for alternative green cleaners;

- Degreasers
- Floor strippers
- Glass cleaners
- Carpet cleaners
- Floor care products
- General hand cleaners

10 Eco-Friendly Ingredients for Everyday Green Cleaning

- 1. Baking Soda (Sodium bicarbonate)
- 2. Castile (from olive oil) or Natural Dish Soap
- 3. Club Soda
- 4. Essential Oils (natural plant-based oils)
- 5. Hydrogen Peroxide
- 6. Kosher Salt
- 7. Lemons and Limes
- 8. Non- Genetically Modified Cornstarch
- 9. Organic Olive Oil
- 10. Vinegar

Make It Energy Efficient

HVAC = Heating, Ventilation and Air Conditioning

Air Quality

clean	*vs.*	**green**
• high number of air changes • 100% outside air sometimes required		• **minimize air changes** • **re-circulate air**

Make It Energy Efficient

Heat recovery

- Waste heat is the energy that is generated in industrial processes and is not put into use, but lost into the environment.
- The use of waste heat recovery systems in industrial processes is a major key to reduce fuel consumption, lower harmful emissions and improve production efficiency.

Make It Energy Efficient

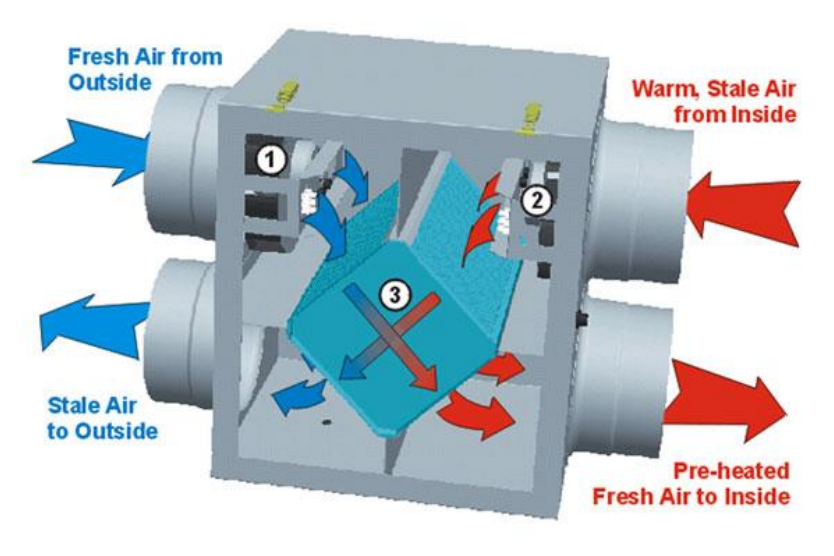
Heat recovery

- Heat recovery provides valuable energy sources and reduces energy consumption.
- Before exhausting air from the hospital, recover some of the heating, cooling and/or humidity that was added to it
- Recovering waste heat can be conducted through various heat recovery technologies.

Make It Energy Efficient

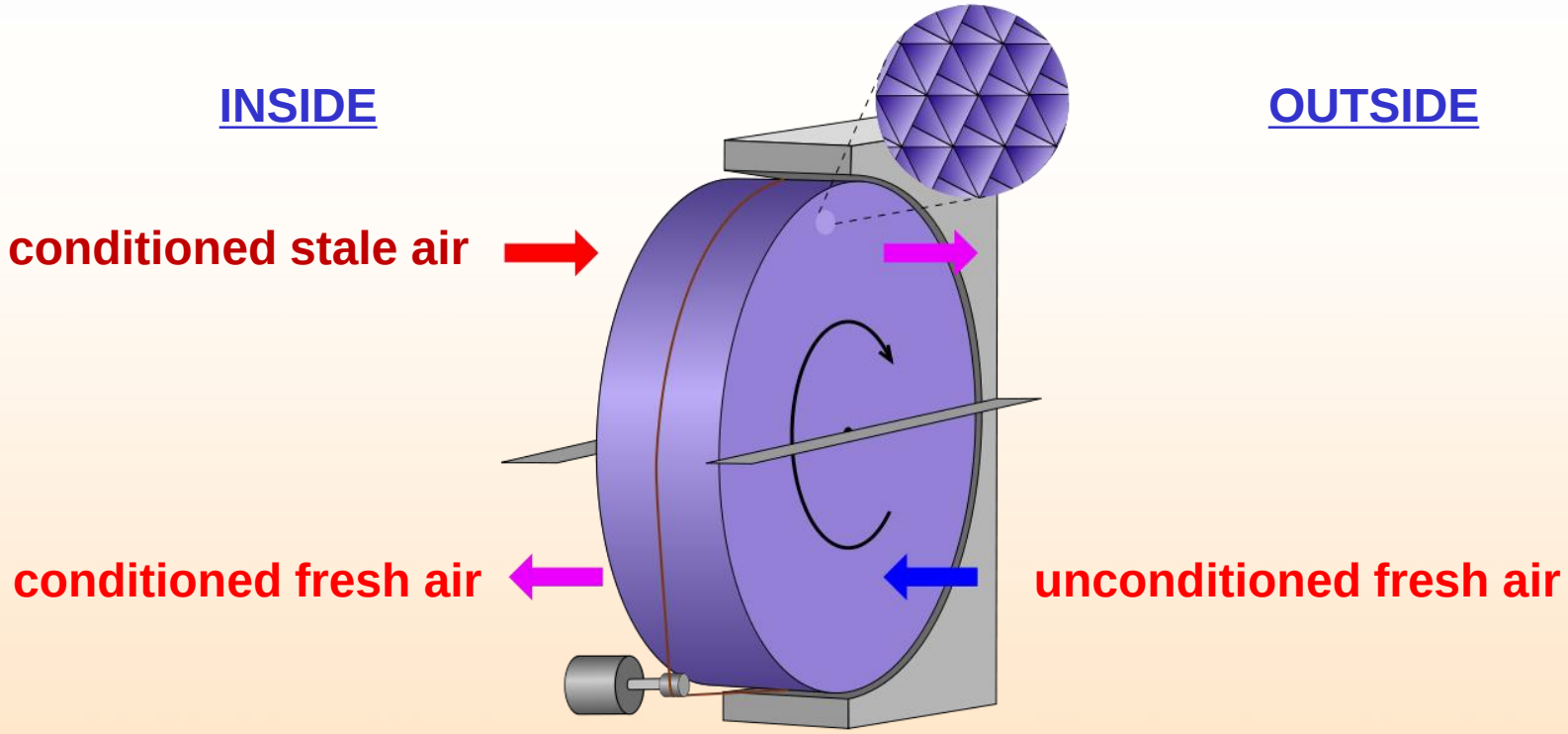
Heat recovery – coil loop recovery

- Uses a loop of liquid to transfer heat between fresh air and exhaust
- Prevents cross contamination between air streams



Make It Energy Efficient

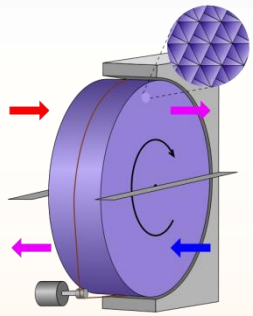
Heat recovery – heat wheels



Make It Energy Efficient

Myth

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



Reality

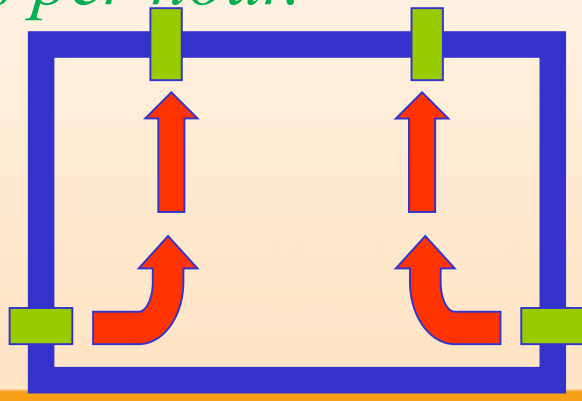
- Heat wheels are already in common use in hospitals
- Most often used in applications with high fresh air intakes
- Heat wheels are not used for negative pressure isolation rooms

Make It Energy Efficient

Displacement Ventilation

- May allow for fewer air exchanges without sacrificing infection control
- Early results are promising

*"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."*



Make It Water Efficient

Hands free sinks

clean

- **fewer hands touching the same thing**

and

green

- **not relying on hands to turn sinks off**

Look for self charging hands-free faucets.

Operating A Clean & Green Hospital

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

Biomedical Waste

Collaboration:

- Joint education from Infection Control and Environmental Services :
  - appropriate handling of waste required within hospital
  - 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 check local regulations.*

Reduce

Toxic Chemical Use

Myth

- Everything in a hospital needs to be disinfected

Reality

- Only some hospital areas need to be disinfected

Reduce
Toxic Chemical Use

Collaboration:

- Joint assessment between IPC and ES to determine when cleaning is needed and when disinfecting is required
  - good housekeeping practices can ensure cleaning is effective without unnecessary use of harsh chemicals
  - many cleaning products – whether conventional or "green" – have little or no impact on IPC.
  - May be paying more for disinfecting chemicals when only "regular" cleaning products will suffice

Reduce

Toxic Chemical Use

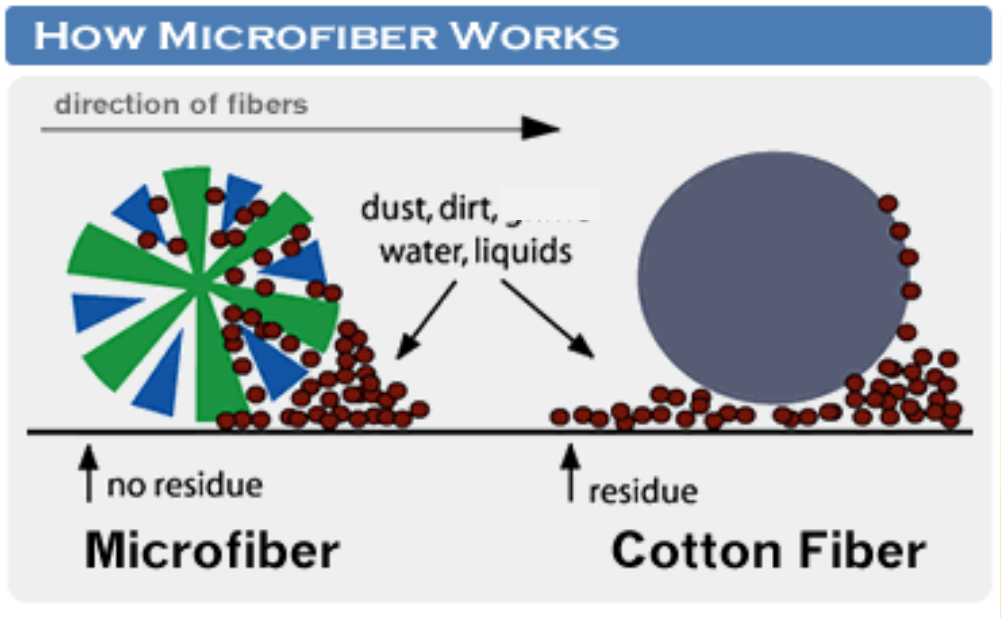
- **Ecologo certification for hand sanitizers;**
  - Standardized
  - less harmful raw materials
  - products should include “biobased” content
  - recyclability of packaging

    www.ecologo.org/en/criteria/subpage.asp?page_id=197

Reduce

Toxic Chemical Use and Water Use

- **Microfibre mops**
  - synthetic, ultrafine fibres
  - nature of fibre means mops require less water and chemical than traditional mops



source: www.microfiber-towels.com

Efficacy of Microfiber Technology With & Without a disinfectant :

- The use of a disinfectant did not improve the microbial elimination, compared with the microfiber system with detergent alone.

Microfiber Mopping & Detergents

- ✓ Using microfiber mops
- ✓ Minimizing disinfectant use
- ✓ Moving to microfiber cloths
- ✓ One patient room – one microfiber mop

- Claims of reduced bacteria through use of microfiber still being validated…….

Reduce

Waste and Energy

- **"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

HVAC Scheduling

- **Turning off the fans when the room is empty ;**
- **minimum air changes for critical areas (e.g., ORs)**

Reduce

Energy Use

Filter Changes

- A preventative maintenance program to ensure that HVAC filters are regularly changed ;
  - ensures air quality is maintained
  - reduces inefficiencies from clogged filters

Reduce

Pharmaceutical Waste Down The Drain

Avoiding disposal of drug waste down the drain...

clean

- may avoid development of antibiotic resistance
- helps prevent formation of bacterial biofilms in drains and pipes

and

green

- avoids disposal of drug waste down the drain

Reuse

Single Use Devices

- **It's a Clean Green process regarding reduction of waste through reuse of items**
- **Third party reprocessing of devices is available**
  - reprocessor provides validation 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

Recycle

In A Hospital

- Proactive and ongoing education, both inside and outside of the hospital, is the 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

Recycle

Cans and Bottles

- 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

Creating A Clean & Green Culture

Effective Cleaning

- ✓ Collaborative Partnership
- ✓ Respect for importance of cleaning and critical role of ES professional in protecting patients from HAIs
- ✓ Staff Education
- ✓ Standardization of protocol
- ✓ Active Monitoring
- ✓ Policy Development

Driving forces for Green Cleaning

- ✓ Reduction/Simplicity in number of products in use.
- ✓ Water Use and Chemical Use Reduction
- ✓ Improved air quality
- ✓ Safer work environment, reduced chemical exposures.
- ✓ Increased patient and staff satisfaction
- ✓ Green Guide for Health Care
- ✓ Creation or maintenance of a healing environment

Creating A Clean & Green Culture

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

clean	Vs.	**green**
hand washing		turning off lights, recycling, etc.

Creating A Clean & Green Culture

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

Vs.

green

- learn what your hospital's clean goals are
- don't pretend that you know what your hospital's clean goals are

Keep in Mind

- **Patient Zone Surfaces** are potentially leading to healthcare-associated infection.
- **Optimizing hand hygiene and isolation practice** is essential
- Effectiveness and thoroughness of **environmental cleaning must also be optimized**
- **Technology** is the enabler –not the solution.

Wrap Up

- MDROs and other pathogens will continue to present challenges to patient safety
- Keep an open mind to green cleaning
- Apply a risk assessment process to enhance quality and efficacy of cleaning / disinfection

How to Proceed?

A Collaborative Partnership

Collaborations between environmental Services and IPC best practice is critical

Brighten our World

Together we can contribute to a **cleaner** and **healthier** community, and planet.

Thank You

Ossama Rasslan

dean@aicpd.org