An Evidence-Based Perspective on Environmental Hygiene

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Objectives:

• Review the goals for maintaining a clean environment incorporating basic evidence-based approaches to cleanliness.

• Discuss the benefit for synergy between Clinical Personnel and Environmental Services Professionals for patient safety, a clean environment, and to improve patient satisfaction.

• Review the revised Association for the Healthcare Environment Practice Guidance and strategies for unit-based implementation and creation of best practices.
Healthcare-Associated Infections (HAIs)

- 1 out of 20 hospitalized patients affected
- Associated with increased mortality
- Attributed costs: $26-33 billion annually
- HAIs occur in all types of facilities, including:
  - Long-term care facilities
  - Dialysis facilities
  - Ambulatory surgical centers
  - Hospitals

What do these have in common?
MUCH OPPORTUNITY!!!!

- Many HAIs are preventable with current recommendations
- Failure to use proven interventions is unacceptable
- Only 30%-38% of U.S. hospitals are in full compliance
- Just 40% of healthcare personnel adhere to hand hygiene
- Insufficient infection control infrastructure in non-acute care settings has allowed major lapses in safe care

Where do you even begin?

HHS Action Plan 5-year Goals

<table>
<thead>
<tr>
<th>Metric</th>
<th>National 5-year Prevention Target</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central line-associated bloodstream infections</td>
<td>50% reduction</td>
<td>NHSN</td>
</tr>
<tr>
<td>Adherence to central line insertion practices</td>
<td>100% adherence</td>
<td>NHSN</td>
</tr>
<tr>
<td>Clostridium difficile infections and hospitalizations</td>
<td>30% reduction</td>
<td>NHSN, NHDS, HCUP</td>
</tr>
<tr>
<td>Catheter-associated urinary tract infections</td>
<td>25% reduction</td>
<td>NHSN</td>
</tr>
<tr>
<td>MRSA invasive infections (population)</td>
<td>50% reduction</td>
<td>EIP</td>
</tr>
<tr>
<td>Surgical site infections</td>
<td>25% reduction</td>
<td>NHSN</td>
</tr>
<tr>
<td>Surgical Care Improvement Project measures</td>
<td>95% adherence</td>
<td>SCIP</td>
</tr>
</tbody>
</table>

NHSN = CDC's National Healthcare Safety Network
NHDS = CDC's National Healthcare Discharge Survey
EIP = CDC's Emerging Infections Program
HCUP = AHRQ's Healthcare Cost and Utilization Project
SCIP = CMS's Surgical Care Improvement Project
Fundamental Question

Who is responsible for Infection Prevention?

Could this be You Family Member?

External Pressures

Payment Reform
Decreased reimbursement
NHSN
Accountable Care Organizations
Staffing Challenges
Public Reporting

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The Puzzle

Key Drivers
- Rising Costs of Healthcare
- Elevated Customer Demands
- Decreasing Reimbursement
- Increased Legislation
- Consumer Demand for Better Healthcare and Transparency
- Consumer Advocacy
- C-Suite Accountability
- HAI Lawsuits

Who are the key players?
- APIC: Association for Professionals for Infection Control and Epidemiology
- SHEA: Society for Healthcare Epidemiology of America
- INS: Infusion Nurses Society
- AHE: Association for the Healthcare Environment
- IDSA: Infectious Disease Society of America
- AAHC: Accreditation Association for Ambulatory Health Care
- The Joint Commission
- CDC: Centers for Disease Control and Prevention
- AORN: Association of Perioperative Nurses
- CMS: Center of Medicare Services
- HI: Institute for Healthcare Improvement
- Consumer Lobbies
Transmission of Infection
Role of the Environment

How Does Transmission Occur?
Infection Preventionists
Environmental Services Professionals
Contaminated Hands
Contaminated Skin
Contaminated Environmental Surfaces

Transmission
Contact
• Direct
• Indirect
• Drop
Airborne
Vehicle
Vectorborne
Pathogens of Significance

- Yeasts
- Novel viruses
- ESBL
- MDR Bacteria
- Klebsiella


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Pathogens of Significance

- Healthcare facilities are faced with challenges for prevention of spread of pathogenic microorganisms
- Emergence of antimicrobial-resistant microbes
- Rising incidences of healthcare-induced *Clostridium difficile*
- Controlling spread of viral infections

Factors in Disinfectant Efficacy

- Concentration and exposure time to disinfectant (contact time)
  - Most quats have longer contact time – 10 minutes
  - Alcohols or alcohol/quats-2 min to 5 min
  - Contact time stated by manufacturer based on testing performed for EPA on microbial load of bacteria (bioburden)
- Nature of object to be cleaned/disinfected
- Temperature and relative humidity

EH Spaulding’s Approach to Disinfection

- Dr. Earle H. Spaulding believed that how an object will be disinfected depended on the object’s intended use.
- The approach to disinfecting objects is divided into three categories: Critical, Semicritical, and Noncritical
Noncritical Items

- Items that contact intact skin but not mucous membranes.

- Objective: These items can be contaminated with some microorganisms and can potentially contribute to transmission.

- Require minimum of low-level disinfection.
Best Practices for Disinfection of Non-Critical Items

Examples include surfaces in the environment and medical equipment used in patient care

Healthcare Grade Disinfectants

- All disinfectants used in the US MUST be EPA-registered
- In healthcare settings, use a healthcare grade disinfectant
- Do not use sanitizers in healthcare settings, only for foodservice

FDA vs. EPA

- FDA:
  - OTC Drugs:
    - Skin Antiseptics
    - NSA or IMA
  - Rx Drug
  - High Level Disinfectants/Sterilization
- EPA:
  - Pesticides:
    - Healthcare Grade Disinfectants:
      - Low Level Disinfectants
      - Intermediate Level Disinfectants
    - Sanitizers
Levels of Product Approval

- High Level Disinfectants
- Intermediate Level Disinfectants
- Low Level Disinfectants
- Sanitizers

Off Label Inquiries

- FDA
  - Off Label Use allowed at the discretion of the prescriber
  - Manufacturer Regulations in place to share evidence-based clinical practice-Good Reprint Practices
- EPA
  - User and Facility Liable for Off-Label use
  - No protection under federal Law
  - FIFRA

Components of EPA Labels

- Keep Out of Reach of Children Statement
- Signal Words
- First Aid Instructions
- Net Contents/net weight
- EPA Registration Number
- EPA Establishment Number
- Precautionary Statements
- Directions for use
- Storage and Disposal statement
- Product Specific marketing claims and graphics
Sample EPA Disinfectant Label

Selecting the Right Disinfectant

- Disinfectants used in healthcare facilities must be EPA approved
- Disinfectant should be used in the dilution and manner (contact time) recommended by the manufacturer
- Disinfectants that are "ready to use, or dispensed in pre-measured amounts, are preferred over those that require mixing.

Core Product Evaluation Questions

- Is the disinfectant EPA or FDA registered/approved? If so, what is the EPA/FDA registration number?
- What level disinfectant is the product?
- Are there any independent studies available supporting the efficacy of the solution?
- Will this practice increase my compliance with the EBP guidelines/regulatory bodies/accreditation agencies?
- What value-adds are available to enhance compliance, improve outcomes, and decrease cost?
Do You Have These?

Disinfecting Noncritical Items
Choosing a Disinfectant Method

- Item(s) to be cleaned?
- Safety?
- Ease of use?
- Costs?

Critical Claims

- Broad Spectrum for bacteria
- Viruses (non-enveloped and enveloped)
- Multi-Drug Resistant Organisms (Drug Resistant Strains)
- Pathogenic Fungi (Candida)
- Bloodborne Pathogens (HIV, HBV, HCV)
- Emergent Pathogens (Novel viruses, etc.)
Total Contact Time

- Contact Times:
  - Bacteria
  - Viruses
  - TB
  - Fungi
  - Spores

- Clinicians should follow the US EPA FIFRA standards, and all applicable user instructions

- Total Contact Time is the longest contact time required

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Quiz: What is the Contact Time?

Guidelines Quote...

Contact Times for Surface Disinfectants

An important issue concerning use of disinfectants for noncritical surfaces in healthcare settings is that the contact time specified on the label of the product is often too long to be practically followed. The labels of most products registered by EPA for use against HIV, HCV, or M. tuberculosis specify a contact time of 10 minutes. Such a long contact time is not practical for disinfection of environmental surfaces in a healthcare setting, because most healthcare facilities apply a disinfectant and allow it to dry in 1-2 minutes. Multiple scientific papers have demonstrated significant microbial reduction with contact times of 10 to 60 seconds. Currently, some EPA-registered disinfectants have contact times of one to three minutes. By law,感兴趣的用户 should consult the label instructions for EPA-registered products. Ideally, product users should consider and use products that have the shortest contact time. However, disinfectant manufacturers also need to obtain EPA approval for shortened contact times so these products will be used safely and effectively in the healthcare environment.

### Compliance with OSHA BBP

Rationale: BBP (Bloodborne Pathogens) was developed as a result of the Occupational Safety and Health Administration (OSHA) standard to prevent occupational exposure to bloodborne pathogens. BBP is the implementation of engineering controls, work practice controls, and personal protective equipment (PPE) to protect employees from bloodborne pathogens.

#### Clinical Guidance

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<thead>
<tr>
<th>APIC Clinical Practice Guideline</th>
<th>Evidence-Based Clinical Practice Recommendations</th>
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#### EVS Professionals

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<tr>
<th>Environmental Cleaning</th>
<th>Waste Management</th>
<th>Pest Control</th>
<th>Transport</th>
<th>Environmental Monitoring</th>
<th>Product Selection and Evaluation</th>
<th>Laundry</th>
</tr>
</thead>
</table>

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EVS EBP-Reference for Environmental Cleaning

Collaboration

Outline

- EVS Basics
- Infection Prevention and Control
- Basic Microbiology
- PPE
- Special Situations such as OSHA BBP
- Quality Assurance
- Environmental Monitoring
- Novel Technologies
- Cleanroom Cleaning
Core Themes

- Maintain a clean environment
- Compliance with regulations
- Protocols must be consistent
- EVS Leadership must be collaborative
- Separate waste streams
- EVS may be responsible for Pest Control
- EVS professionals will use EBP standards from CDC and others

Environmental Monitoring

- Bioluminescence
- ATP Monitoring
- Visual
- New Emerging Technologies
- Measurement of Compliance

Staff Education and Training

- Annual and New Hire Competency
- Documentation
- Components of Required Training:
  - Proper Use/Instructions for Use
  - Indications for Use
  - PPE
  - Disposal
  - First Aid/MSDS
Antimicrobial Stewardship

CDC knowledge and data fuels local to national prevention: Environmental Hygiene?

The need for HAI prevention research

• Need for complete implementation of practices known to prevent HAIs

• Need for ongoing research to identify new strategies to prevent the remaining HAIs
Hypothetical?

• If you knew.................................

• That you could do something simple, easy, cost effective, and that was

• Evidence-Based, but took a little extra time.....

• Would you do it????? 

Summary

• Disinfectants must be EPA-registered
• Total Contact Time ensures proper efficacy is achieved
• Follow Evidence-Based guidelines for appropriate disinfectant use
• Off-Label Use of Disinfectants can result in personal and institutional liability
• Training is critical for proper and safe use
• IP’s + EVS Professionals=HAI Prevention
Questions

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