NETEC COVID-19 Webinar Series:

Environmental Cleaning and Infection Prevention
Welcome

Sharon Vanairsdale, DNP, APRN, ACNS-BC, NP-C, CEN, FAEN, FAAN
Welcome: Sharon Vanairsdale, DNP, APRN, ACNS-BC, NP-C, CEN, FAEN, FAAN

Basic Principles of Contact Transmission and the Role of Low-Level Disinfectants, Cleaning and Disinfection: Terry Micheels, MSN, RN, CIC, FAPIC

Environmental Cleaning and Disinfection of Surfaces in the Context of COVID-19: Kari L Love, MS, RN, CIC, FAPIC

Environmental Cleaning Challenges and Strategies in Post-Acute and Long-Term Care: Kate Tyner, BSN, RN, CIC

NETEC Resources: Sharon Vanairsdale, DNP, APRN, ACNS-BC, NP-C, CEN, FAEN, FAAN

Questions and Answers with NETEC
Welcome

National Emerging Special Pathogens Training and Education Center

Mission Statement
To increase the capability of the United States public health and health care systems to safely and effectively manage individuals with suspected and confirmed special pathogens

For more information
Please visit us at www.netec.org
or email us at info@netec.org
NETEC Overview

Assessment
- Empower hospitals to gauge their readiness using **Self-Assessment**
- Measure facility and healthcare worker readiness using **Metrics**
- Provide direct feedback to hospitals via **On-Site Assessment**

Education
- Provide self-paced education through **Online Trainings**
- Deliver didactic and hands-on simulation training via **In-Person Courses**
- COVID-19 focused **Webinars**

Technical Assistance
- **Onsite & Remote Guidance**
- Compile **Online Repository** of tools and resources
- Develop customizable **Exercise Templates** based on the HSEEP model
- Provide **Emergency On-Call Mobilization**

Research Network
- **Online Repository** Built for rapid implementation of clinical research protocols
- Develop Policies, Procedures and Data Capture Tools to facilitate research
- Create infrastructure for a **Specimen Biorepository**

Cross-Cutting, Supportive Activities
- COVID-19 focused Webinars
Basic Principles of Contact Transmission and the Role of Low-Level Disinfectants, Cleaning and Disinfection

Terry Micheels, MSN, RN, CIC, FAPIC
Principles of Transmission

Chain of Infection

Interrupting the pathogen source and Mode of Transmission

Image Credit: NIAID - Colorized scanning electron micrograph of an apoptotic cell (greenish brown) heavily infected with SARS-COV-2 virus particles (pink), isolated from a patient sample
Break the Chain

Environmental factors play a role in the transmission of microorganisms

• Stop transmission by eliminating
  • Source of infectious agents
  • Means of Transmission

• Environmental sources
  • Used patient equipment
  • Patient bed and furniture
  • Environmental surroundings
  • Sinks, basins
Basic Principles of Contact Transmission and the Role of Low-Level Disinfectants, Cleaning and Disinfection

Direct and Indirect Routes of Contact Transmission
Coronaviruses are enveloped, single-stranded, positive-stranded RNA viruses classified within the Nidovirales order that infect many animals and humans.

Two studies, published in the New England Journal of Medicine (NEJM) and The Lancet, investigated how long coronaviruses survive on surfaces.

The SARS-CoV-2 virus is stable for several hours to days in aerosols and on surfaces.

Most Coronaviruses survive for a shorter time at higher temperatures and humidity levels.

Microorganisms persist on environmental surfaces

<table>
<thead>
<tr>
<th>Microorganism</th>
<th>Lifespan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>Hours to several days</td>
</tr>
<tr>
<td>MRSA</td>
<td>7 days to 7 months</td>
</tr>
<tr>
<td>Clostridium Difficile (spores)</td>
<td>7 days to 7 months</td>
</tr>
<tr>
<td>SARS CoV-2</td>
<td></td>
</tr>
<tr>
<td>• Plastic</td>
<td>3-7 days</td>
</tr>
<tr>
<td>• Stainless Steel</td>
<td>3-7 days</td>
</tr>
<tr>
<td>• Paper</td>
<td>Up to 4 days</td>
</tr>
<tr>
<td>• Glass</td>
<td>Up to 4 days</td>
</tr>
<tr>
<td>• Cardboard</td>
<td>24 hours</td>
</tr>
<tr>
<td>• Wood</td>
<td>Up to 2 days</td>
</tr>
</tbody>
</table>
### Spaulding Classification

**Noncritical items require low-level disinfection**

<table>
<thead>
<tr>
<th>Items come into contact with</th>
<th>Classification</th>
<th>Processing Required</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sterile tissue or vascular system</td>
<td>Critical</td>
<td>Sterilization</td>
<td>Surgical instruments, catheters, needles</td>
</tr>
<tr>
<td>Non-intact skin or mucous membranes</td>
<td>Semi-critical</td>
<td><em>Minimum</em> high level disinfection</td>
<td>Respiratory equipment, endoscopes</td>
</tr>
<tr>
<td>Intact skin</td>
<td><strong>Noncritical items</strong></td>
<td>Low level disinfection</td>
<td>Tourniquets, blood pressure cuff, linens, furniture</td>
</tr>
</tbody>
</table>

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Surface are cleaned before they are disinfected

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>The removal of visible soil (organic and inorganic material) from surfaces. Accomplished by manual or mechanical removal by using water, detergents or enzymatic products, and friction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disinfection</td>
<td>The process that eliminates many or all microorganisms, except spores, on inanimate surfaces.</td>
</tr>
<tr>
<td>Sterilization</td>
<td>Process that destroys or eliminates all forms of microbes.</td>
</tr>
</tbody>
</table>
Principles of Cleaning and Disinfection

Microorganisms are transferred from environmental surfaces to patients via direct contact with the surface or indirect contact transmission.

<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removes germs, dirt and impurities from surfaces or objects</td>
<td>Surfaces have to be cleaned before they can be disinfected</td>
</tr>
<tr>
<td>Renders the surface safe to handle</td>
<td>Disinfection works by using chemicals to kill germs left on surfaces or objects</td>
</tr>
<tr>
<td>Removes organic matter and visible soil, which interferes with disinfection</td>
<td>A few spores may remain following disinfection</td>
</tr>
<tr>
<td>Use detergent, water and friction to <em>physically remove germs</em> from surfaces</td>
<td>“Two Step” method:</td>
</tr>
<tr>
<td>Always use a moistened cloth to avoid contaminating the air with air-borne particles</td>
<td>• Clean a surface in one step, then apply disinfectant in another step, allow the surface to remain wet for required contact time</td>
</tr>
<tr>
<td></td>
<td>• Used for visibly soiled surfaces or high-risk organisms</td>
</tr>
</tbody>
</table>
Hierarchy of Resistance

Pathogen Resistance to Disinfectants

- **Prions**: Transmissible spongiform encephalopathy (TSE), Creutzfeldt-Jakob Disease (CJD), Screpe
- **Bacterial Spores**: Spores of *C. difficile*, *C. tetanus*, *C. botulinum*, *C. perfringens*, Anthrax
- **Mycobacteria**: *M. Tuberculosis* (TB), *M. avium*, *M. chelonae*
- **Viruses without Envelopes**: Norovirus, Rotavirus, Rhinovirus, Poliovirus, HPV, Adenovirus
- **Fungi (Includes Fungal Spores)**: Aspergillus, Candida albicans
- **Gram Negative Bacteria**: Pseudomonas, *E. coli*, Enterobacter, Acinetobacter, Klebsiella
- **Gram Positive Bacteria**: Enterococcus, Clostridia vegetative rods, Staphylococcus, Streptococcus
- **Viruses with Lipid Envelopes**: Influenza, HBV, HCV, HIV, CMV, Rubella, Varicella-Zoster
EPA Registered Antimicrobial Products

- EPA-registered antimicrobial products may not make efficacy claims against pathogens unless the Agency has reviewed data to support the claim and approved the claim on the label.

- EPA has several disinfectant lists (A-N) with products that meet the defined antimicrobial criteria of each list.
  - Example:
    - List A: EPA’s Registered Antimicrobial Products as Sterilizers
    - List B: EPA Registered Tuberculocide Products Effective Against Mycobacterium tuberculosis

- EPA-registered products are consistent with the product labeling compliance with OSHA requirements for exposure to blood borne pathogens.
SARS-CoV-2 is a new virus and not readily available for use in commercial laboratory testing to see if disinfectant products are effective at killing the virus. While surface disinfectant products on List N have not been tested specifically against SARS-CoV-2, the EPA expects them to kill the virus because they:

- Demonstrate efficacy (e.g. effectiveness) against a harder-to-kill virus
- Demonstrate efficacy against another type of human coronavirus similar to SARS-CoV-2

All surface disinfectants on List N can be used to kill SARS-CoV-2 viruses on surfaces. Before applying any EPA-registered disinfectant product, users must read the label to determine if the product is approved for the intended use.
What if My Disinfectant Isn’t on the EPA “N” List?

- Look for an EPA-registered product with “human coronavirus” listed as a target pathogen on the product label.

- Look for the EPA registration number on the label to confirm the product is EPA registered and follow the label directions when using it.

- Products with animal coronavirus claims are not generally included on List N because sufficient data may not be available to confirm whether these products will work against human coronaviruses like SARS-CoV-2.
What if My Disinfectant Isn’t EPA Approved?

If a product doesn’t have an EPA registration number, then the EPA has not reviewed any data on whether the product will kill public health pathogens, such as viruses.

EPA will not add products to List N that do not have an EPA registration number because there is no data showing it will work on human coronaviruses and it can be used safely.

CMS requires environmental surfaces to be cleaned and disinfected using an EPA registered disinfectant in patient care areas on a regular basis.
Environmental Cleaning and Disinfection of Surfaces in the Context of COVID-19

Kari L Love, MS, RN, CIC, FAPIC
Environmental Cleaning and Disinfection of Surfaces in the Context of COVID-19

Principles of Transmission

- Environmental cleaning and disinfection procedures
  - Appropriate contact times
  - Frequently touched surfaces or objects
- Medical equipment
  - Dedicated, Non-dedicated, non-disposable
- Terminal cleaning of rooms
  - PPE to be worn by environmental services personnel
- Management of laundry, food service utensils, and medical waste

Image Credit: NIAID-RML - This scanning electron microscope image shows SARS-CoV-2 (round blue objects) emerging from the surface of cells cultured in the lab.
Follow the manufacturer’s instructions to ensure that disinfectants are prepared and handled safely, wearing the appropriate personal protective equipment (PPE) to avoid chemical exposure.

Selection of disinfectants

- Consider microorganisms targeted,
- Understand the recommended concentration and contact time
  - Contact time = Period of time a surface must remain wet
- Compatibility of the disinfectant and surfaces
- Toxicity and stability of the product
- Ease of use

EPA Approved Disinfectants will have the contact time for inactivation or kill of organisms on the product label.
Frequently Touched Surfaces

Disinfect all “high-touch” surfaces daily and upon discharge
- This includes horizontal, vertical and contact surfaces
- Cleaned surfaces should remain wet and air dry per the label’s instruction

Clean floors on a regular basis, when spills occur and when visibly soiled
# Sample Checklist

## COVID-19 Patient Care Playbook

### Checklist for Routine Room Cleaning and Disinfection

<table>
<thead>
<tr>
<th>Complete q 4 hours or PRN</th>
<th>EVS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nursing</strong></td>
<td></td>
</tr>
<tr>
<td>Thermometers and after each use</td>
<td>Unit door knobs (inner/outer)</td>
</tr>
<tr>
<td>Pumps</td>
<td>Patient room door knobs (outer)</td>
</tr>
<tr>
<td>IV Poles</td>
<td>Nursing station</td>
</tr>
<tr>
<td>Computer Keyboard and mouse</td>
<td>Phones</td>
</tr>
<tr>
<td>GE Monitors</td>
<td>Floors outside of patient rooms</td>
</tr>
<tr>
<td>Cables and Cords</td>
<td>Hand sanitizer dispensers or holders</td>
</tr>
<tr>
<td>Bed Rails/Over Bed Table/ Bed controls</td>
<td></td>
</tr>
<tr>
<td>Nurse work space, counter tops</td>
<td></td>
</tr>
<tr>
<td>BP cuff and after each use</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complete 1 time per day or PRN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inside Patient Room (Nursing OR EVS)</strong></td>
</tr>
<tr>
<td>Remote control</td>
</tr>
<tr>
<td>Phone</td>
</tr>
<tr>
<td>Room light switch</td>
</tr>
<tr>
<td>Door Knobs (inner)</td>
</tr>
<tr>
<td>Room sink (including sink handles)</td>
</tr>
<tr>
<td>Furniture (chairs, sofas, etc.)</td>
</tr>
<tr>
<td>Lift Equipment</td>
</tr>
<tr>
<td>Paper towel Dispenser</td>
</tr>
<tr>
<td>Soap Dispenser or holder</td>
</tr>
<tr>
<td>Hand sanitizer dispenser or holder</td>
</tr>
<tr>
<td>Spot check walls for visibly soiled stains/areas</td>
</tr>
</tbody>
</table>
Use dedicated, disposable devices when available

If a dedicated, disposable device is not available, disinfect all non-critical patient care equipment before removing the device from the room and before using it with another patient

Use an EPA-registered hospital disinfectant following the label’s instructions

Assure staff responsible for device cleaning receive training on cleaning procedures that follow the equipment manufacturer’s instructions
In general, only essential personnel should enter the room of patients with COVID-19. Healthcare facilities should consider assigning daily cleaning and disinfection of high-touch surfaces to nursing personnel who will already be in the room providing care to the patient.

If this responsibility is assigned to EVS personnel, they should wear all recommended PPE when in the room.

PPE should be removed upon leaving the room, immediately followed by performance of hand hygiene.
Management of laundry, food service utensils, and medical waste should also be performed in accordance with routine procedures.
Conclusions

- Follow current best practices for environmental disinfection
- Properly train and educate environmental service technicians on proper cleaning and disinfection processes
- Have nursing, respiratory therapists, infection preventionists and environmental services agree upon a list of equipment that are to be cleaned and disinfected by nursing and by environmental services
Environmental Cleaning Challenges and Strategies in Post-Acute and Long-Term Care

Kate Tyner, BSN, RN, CIC
The post-acute care setting is NOT exactly like acute care

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpet in resident rooms</td>
<td>• Resident belongings and décor</td>
</tr>
<tr>
<td>Craft and social rooms</td>
<td>• Independent residents</td>
</tr>
<tr>
<td>Shared dining spaces</td>
<td>• Regulatory climate</td>
</tr>
<tr>
<td>Use of medication and treatment carts</td>
<td></td>
</tr>
</tbody>
</table>
Environmental Cleaning Challenges and Strategies in Post-Acute and Long-Term Care

Significant Variation in Practices Between Facilities

- Contact precaution rooms cleaned differently than rooms without contact precautions (n=27 LTCF): 85.2% Yes, 14.8% No

- Additional measures by environmental services staff for cleaning contact precaution resident rooms (n=23 LTCF):
  - EVS wears gowns, gloves, goggles: 88.9%
  - Clean last each day: 37.0%
  - Use disposable or dedicated wipes: 11.1%
  - Clean first each day: 7.4%
  - Cleaned more frequently: 3.7%
  - More room items cleaned during daily cleaning: 3.7%
  - More room items cleaned during discharge cleaning: 3.7%
  - Disinfectant left longer on surfaces: 3.7%

Regulation §483.15(a) Dignity

The facility must promote care for residents in a manner and in an environment that maintains or enhances each resident’s dignity and respect in full recognition of his or her individuality

• Respecting residents’ private spaces and property (e.g., not changing radio or television station without resident’s permission, knocking on doors and requesting permission to enter, closing doors as requested by the resident, not moving or inspecting resident’s personal possessions without permission);
• Maintaining an environment in which there are no signs posted in residents’ rooms or in staff work areas able to be seen by other residents and/or visitors that include confidential clinical or personal information

Overcoming the Challenge

Standardize basic protocols and training

Environmental Services Cleaning Guidebook (Minnesota Hospital Association)

Environmental Cleaning in Healthcare Training Video Series (Nebraska ICAP and ASAP)
NETEC Resources

Sharon Vanairsdale, DNP, APRN, ACNS-BC, NP-C, CEN, FAEN, FAAN
Slides 21: EPA List A: Antimicrobial Products Registered with the EPA as Sterilizers
https://www.epa.gov/pesticide-registration/list-antimicrobial-products-registered-epa-sterilizers

Slide 21: EPA List B: EPA’s Registered Tuberculocide Products Effective Against Mycobacterium Tuberculosis
https://www.epa.gov/pesticide-registration/list-b-epas-registered-tuberculocide-products-effective-against-mycobacterium

Slide 32: CDC Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019


Slide 37: FHCA – Best Practices for Compliance Related to Resident Dignity in Skilled Nursing Facilities
https://www.fhca.org/members/qi/clinadmin/dignity2.pdf

Slide 38: Environmental Services Cleaning Guidebook

Slide 38: Environmental Cleaning in Healthcare Training Video Series
NETEC will continue to build resources, develop online education, and deliver technical training to meet the needs of our partners.

Ask for help!

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Submit a Technical Assistance request at NETEC.org
Questions and Answers
Join the Conversation!

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