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ENVIRONMENTAL SERVICES – HAI-AR HOSPITAL WEBINAR

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6/28/2022

OUR MISSION:

To promote, protect, and improve the health and safety of all Hoosiers.

OUR VISION:

Every Hoosier reaches optimal health regardless of where they live, learn, work, or play.

Environmental Services
Protectors of Health

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Environmental Services

Covers a broad range of private and public sector activities along with studying physical, chemical and biological factors that affect the environment and human health.

Focused on PROTECTING and IMPROVING public health, food safety, air quality and disease prevention in the environment where we live and work.

May include:

1. Environmental Cleaning and Disinfecting
2. Environmental Epidemiology and Testing
3. Remediation Activities
4. Abatement of hazardous contaminants and Exposure Science
5. Fundamental Interventions for Infection Prevention and Control

History of EVS

- National Environmental Health Association (NEHA) - Began in the 1930's founded in California and developed by a group of health professionals interested in the state of the environment. Wrote criteria to include environmental health as a body of knowledge and course of study.

- National Institute of Environmental Health Sciences (NIEHS) – Established in 1960's conducts scientific and health studies on the relationship between human health and the natural environment. Famous study includes effects of asbestos exposure in lung health in 1967 which led to nationwide regulations on how to abate and remediate asbestos.
- Environmental Protection Agency (EPA) – Established in 1970's focused on clean air act, water pollution, Endangered Species act requiring a list of plant and animal species that are threatened or endangered disrupting the eco system. Laws were passed to mitigate the harmful effects of chemical and biological exposures.

- Center for Environmental Health (CEH) – Established in 1980 as a division of CDC and focuses on environmental factors that cause or contribute to disability and disease. Today this division also oversees non-occupational injuries related to environmental causes and develops injury prevention strategies.

Environmental Considerations that cause Illness and Death

Viruses
Organisms
Fungus

All leading to infection, illness and/or death if not properly disinfected.

EVS is key in stopping transmission of germs and decreasing or eliminating poor outcomes in Patients/Residents and Coworkers.

Pathogens Survival Times in the Environment

Organism	Duration of Survival
Candida auris	14 - 28 days (measured by colony counts)
Clostridioides difficile	5 months
Acinetobacter sp.	3 days – 5 months
E. Coli	1.5 hours – 16 months
Klebsiella sp.	2 hours - > 30 months
Pseudomonas aeruginosa	6 hours – 16 months
Serratia marcescens	3 days – 2 months
S. Aureus (includes MRSA)	7 days – 7 months

Infections and Outcomes caused by Organism Transmission

Bacteremia

Pnuemonia

Meningitis

Urinary Tract Infection

GI Infection

Sepsis

Serratia marcescens

Pseudomonas

All leading to expensive treatments, hospitalizations or death

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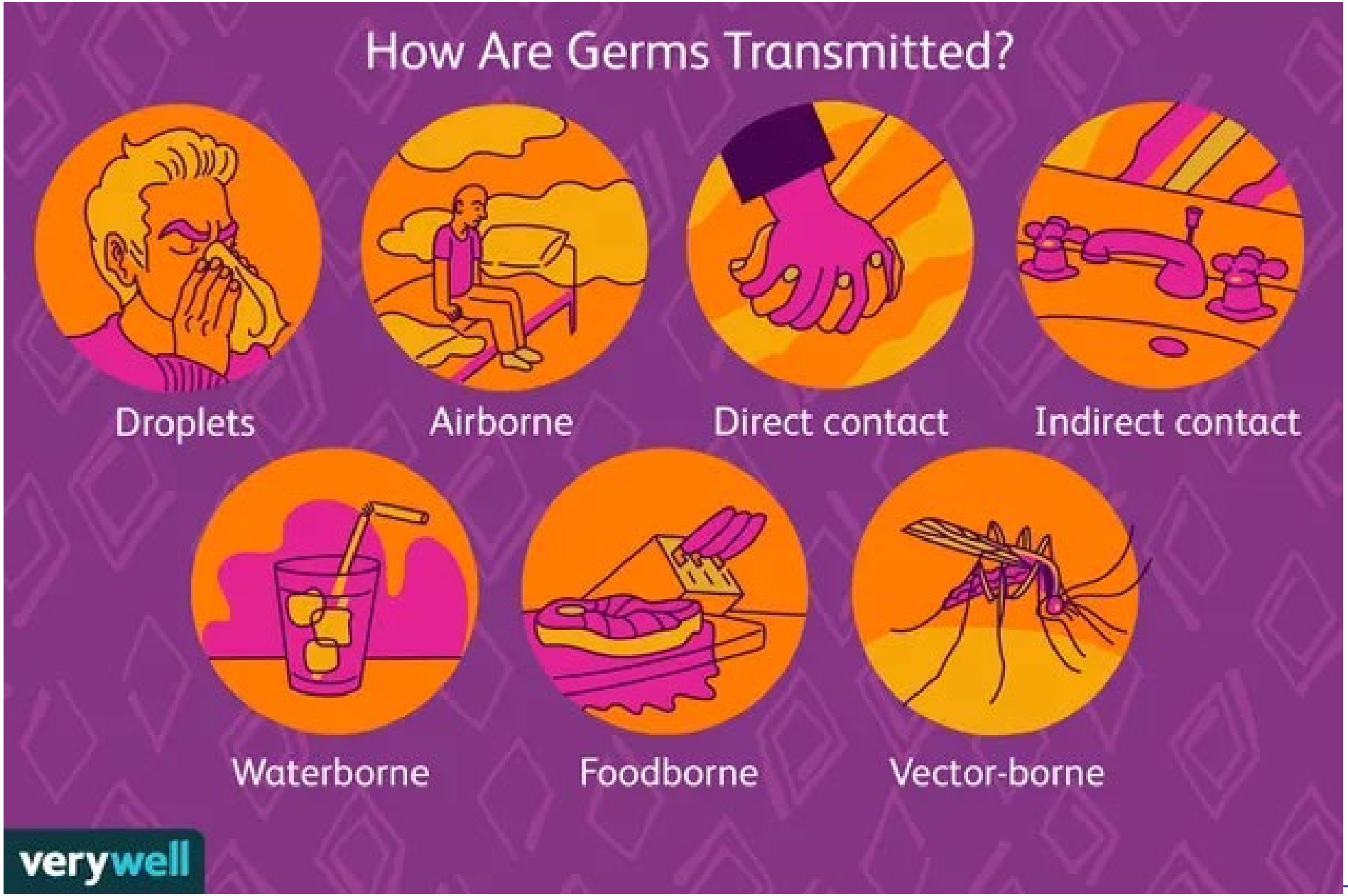

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Multifaceted Approach

Cleaning

Disinfecting

Monitoring

Feedback

Budget and Collaboration with Leadership

Implementation of WASH Infrastructure

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Basic Concepts

Cleaning – **REMOVAL** of VISIBLE soil and organisms from objects and surfaces

Disinfecting – **ELIMINATES** or **DESTROYS** microorganisms on objects except bacterial spores

Sterilization – a process of **KILLING** all microbial life forms including spores.

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Levels of Disinfection

Low Level kills most bacteria, some viruses and some fungi

Intermediate kills bacteria, most viruses and most fungi

High eliminates all microorganisms

The Spaulding Classification Informs Our Approach to Disinfection and Sterilization

Category (Spaulding Class)	Definition	Examples	Minimum reprocessing requirements*
Noncritical equipment	Objects that touch only intact skin	Blood pressure cuffs, stethoscopes, high-touch environmental surfaces	Low level disinfection
Semi-critical equipment	Objects that touch mucous membranes or non-intact skin	Endoscopes, laryngoscopes, respiratory therapy equipment, vaginal specula	High level disinfection (HLD)
Critical equipment	Objects which enter normally sterile tissue or vascular system	Implants, surgical instruments	Sterilization

*Cleaning is **always** required before disinfection and/or sterilization.

(Rutala WA, HICPAC, 2008)

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Factors to Consider when Selecting a Disinfectant

Is it EPA Registered ? (Spectrum Activity = List K, List N, List P)

Is it Easy to Use ? (Contact time, Mixing requirements, steps of delivery, stability)

Is it Safe ? (Flammable or Toxic)

Is it compatible on surfaces ? (computers, screens, plastics, electronics)

Is it odorless ? (doesn't cause irritation to self or others)

Is it cost effective ? (budget considerations)

Does it continue to work after application ?

MIFUs (Manufacturer Instructions for Use)

The Joint Commission, FDA and CMS all require organizations to provide access to information needed to support infection prevention and control.

The MIFU must include and be readily accessible:

* Steps required for cleaning and disinfection
* The level of disinfection required (high, low or intermediate)
* Frequency of disinfection
* Products compatible for use
* May include maximum number of times the item can be reprocessed
* Storage requirements

Failure to follow or misuse the instructions creates risk to safety and quality of care and may be cited.

The Joint Commission

IC 02.02.01 - This standard helps organizations reduce the risk of infections associated with medical equipment, devices and supplies.

*Most commonly cited for failure to ensure that reusable medical devices are reprocessed as per intended use and MIFU and for failure to store medical equipment, devices and supplies in a manner to protect them from contamination.

Ensure that only manufacturer-approved products are used and that all steps of the MIFU are followed for all items undergoing reprocessing, including equipment and accessories.

Prior to release of the items for patient care, validate that the critical parameters for the disinfection and/or sterilization such as process time, temperature, pressure and cycle completion, have been met:

- Applies to the cleanliness of the area in which items are directly stored (e.g., drawers or shelves).
- Clean and dirty items are managed in the same room or area; there needs to be a workflow or process in place to provide clear separation of clean and dirty items.
- Staff who are responsible for accessing clean medical equipment, devices and supplies need to do so in a manner to prevent contamination.

Emerging Viral Pathogen Disinfectants

May 23, 2022, EPA responds to guidance due to recent monkeypox cases in U.S.

Emerging viral pathogens (EVPs) claims:

- Established in preparation against specific pathogens where there are few or no disinfectants tested or registered for use.
- Allows manufacturers time to submit data and demonstrate product efficacy.
- Criteria must be met for EPA to trigger the EVP guidance.
    - Authorizes companies who have EVP claims to make statements about the product's EXPECTED efficacy against the emerging viral pathogen.

EVP Guidance

The EVP guidance divides viruses into three categories:

•Tier 1: Enveloped viruses are the easiest to inactivate. When disinfectants damage a virus's lipid envelope, the virus is no longer infectious.

•Tier 2: Large, nonenveloped viruses are encased in protein capsids that make them more difficult to inactivate compared to enveloped viruses.

•Tier 3: Small, nonenveloped viruses are the hardest to inactivate. Both their protein capsids and their small size make them less vulnerable to disinfectants compared to other viruses.

Pathogen	Difficulty to Inactivate	Description
Monkeypox virus	Tier 1 (enveloped virus)	Monkeypox is a rare disease that is caused by infection with monkeypox virus. List Q
SARS-CoV-2 and variants	Tier 1 (enveloped virus)	SARS-CoV-2 is the virus that causes COVID-19. See also: List N
Rabbit hemorrhagic disease virus (RHDV2)	Tier 3 (small, nonenveloped virus)	RHDV2 is a highly contagious fatal disease in rabbits. It does not impact human health. See also: List O

EPA List Q Products

Access the EPA website at https://www.epa.gov/pesticide-registration/disinfectants-emerging-viral-pathogens-evps-list-q#evps

EPA Registration Number	12345-12
Active Ingredient(s)	
Product Name	Product A
Company	Company XYZ
Contact Time (in minutes)	
Formulation Type	
Surface Types	
For use on Tier 1 viruses?	
For use on Tier 2 viruses?	
For use on Tier 3 viruses?	
Follow directions for the following pathogens	

Clear Filter(s)

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Disinfectants for Emerging Viral Pathogens (EVPs)

Registration Number	Active Ingredient(s)	Product Name	Company	Contact time	Formulation Type	Surface Type	For use on Tier 1 viruses?	For use on Tier 2 viruses?	For use on Tier 3 viruses?	Follow directions for the following pathogen(s)
99349-1	Hypochlorous acid	Hy-Gen	Saltwater Biocides	5	Ready-to-use	Hard Nonporous (HN)	Yes	Yes	No	Rhinovirus type 37
98919-1	Hypochlorous acid	Caspian Disinfectant	Wistwell	10	Ready-to-use	Hard Nonporous (HN)	Yes	Yes	No	Norovirus (Feline calicivirus)
98223-1	Chlorine dioxide	Pro Oxide	Environmental Suface Solutions	10	Dilutable	Hard Nonporous (HN)	Yes	Yes	No	Canine parvovirus
98099-1	Sodium chlorite	PX10	PX10 LLC	1	Dilutable	Hard Nonporous (HN)	Yes	Yes	No	Feline calicivirus
9804-5	Chlorine dioxide	Purogene Deodorizer and Sanitizer	Bio-Cide International Inc	10	Dilutable	Hard Nonporous (HN)	Yes	Yes	No	Poliovirus type 1

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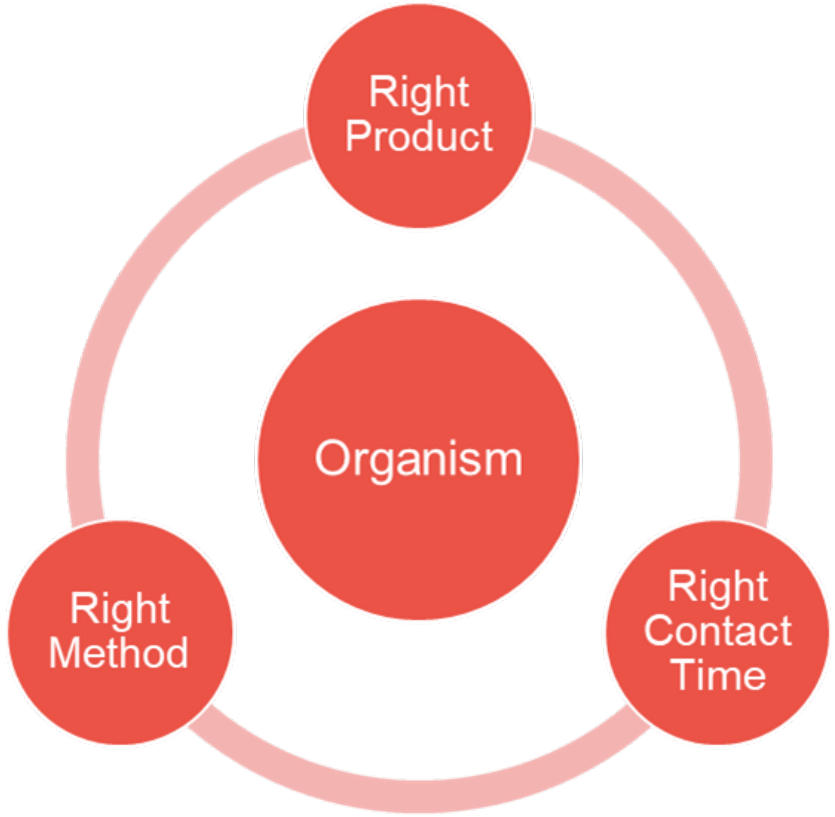
3 R's of Cleaning and Disinfecting

Stop and ask.....

Am I using the **right product** for the organism present and cleaning in the **right method** allowing the **right contact/kill time.**



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Things to Consider

- Have color-coded cleaning cloths (example: one color for cleaning, another color for disinfecting).
- If your facility uses microfiber cloths:
  - Know the life expectancy of the cloth being used (how many times the cloth can be washed before it should be replaced).
- Have a cleaning checklist for your EVS staff to ensure cleaning is done completely and uniformly in every room.

Routine Auditing and Observations

Weekly auditing of practices should occur with EVS, Infection Prevention and/or Leadership should include:

- Performance Observations
- Visual Assessments of Cleanliness
- Tools (fluorescent markers, ATP, UV and visible)

Audits should:

- Review key program elements
- Feedback of practices
- Identification of trends or gaps
- Increases in terminal cleaning of areas

The Environment is More Than Meets the Eye

Figure 1. Pumps lined up outside patient rooms in a hospital ICU (March 2020).

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Who Is Accountable for stopping Transmission

EVERYONE!!!!!

Cleaning and Disinfection is the responsibility of all staff at all times

(Nurses, Doctors, Ancillary Staff, Therapy, EVS and Leadership)

Creating a culture of accountability to stopping disease transmission in the organization is critical to Patient, Resident and Staff health and safety.

This is beneficial to key stakeholders seen through cost saving measures when expensive hospitalizations and treatments are not needed because the environment was properly cleaned and disinfected.

References

Slide 3: http://www.picturequotes.com/if-we-begin-to-diligently-care-for-the-environment-it-will-greatly-improve-human-health-quote-907169

Slide 6: *Welsh RM, Bentz ML, Shams A, et al. Survival, Persistence, and Isolation of the Emerging Multidrug-Resistant Pathogenic Yeast Candida auris on a Plastic Health Care Surface. J Clin Microbiol. 2017;55(10):2996-3005. doi:10.1128/JCM.00921-17*

Slide 6: https://www.cdc.gov/infectioncontrol/pdf/strive/EC101-508.pdf

Slide 7: https://dermnetnz.org/topics/pseudomonas-skin-infections

Slide 7: https://www.jaad.org/article/S0190-9622(07)00757-8/fulltext

Slide 11: www.cdc.gov/infectioncontrol/pdf/strive/E C101-508.pdf (slide 13)

Slide 14: https://www.ismp.org/resources/clinical-experiences-keeping-infusion-pumps-outside-room-covid-19-patients

Slide 15-16: https://www.jointcommission.org

Slide 17-19: https://www.epa.gov/pesticide-registration/disinfectants-emerging-viral-pathogens-evps-list-q

For Additional Questions:

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