Management of Antibiotic Resistant Organisms (MRSA, VRE and ESBL)

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They’ve got what?!
Objectives

At the end of the session you should be able to:

• Define MRSA, VRE, and ESBL
• Describe how transmission of MRSA/VRE/ESBL occurs
• Describe the management of MRS/VRE/ESBL in various health care settings
Key Concepts

Colonization versus Infection

- **Colonization:** Organism (bug/germ) present in or on the body but *is not* causing illness

- **Infection:** Organism (bug/germ) is present in or on the body and *is* causing illness (disease)
Routine Practices

• Infection prevention and control (IPAC) practices to be used with all clients/patients/residents during all care, to prevent and control transmission of microorganisms in all health care settings.

Routine Practice Elements include:

• Risk assessment
• Hand Hygiene
• Personal Protective Equipment
• Control of the Environment
• Administrative Controls
Antibiotic Resistant Organisms (AROs)

- Bacteria which, over time have mutated and developed a resistance to many or all antibiotics; examples:
  - Methicillin-Resistant *Staphylococcus aureus* (MRSA)
  - Vancomycin-Resistant *Enterococcus* (VRE)
  - Clostridium difficile (C. diff)
  - Extended-Spectrum Beta-Lactamase (ESBL)
  - Carbapenemase-Producing *Enterobacteriaceae* (CPE)
The way is long if one follows precepts, but short and helpful, if one follows patterns.

Lucius Annaeus Seneca (Born 5 BC, died 65 AD)
Methicillin-resistant *Staphylococcus aureus* (MRSA)

Image source: @ASM Microlibrary.org
Staphylococcus aureus

VS

Methicillin-resistant Staphylococcus aureus (MRSA)

SKIN and SNOT!
Risk Factors for MRSA

- Prolonged hospital stay
- Prior treatment with antibiotics
- Invasive procedures
- Stay in an intensive care or a burn unit
- Surgical wound infection
- Prior colonization with MRSA
- Close proximity to a colonized client/patient/resident
MRSA Transmission

- Transmitted from patient to patient primarily **via the hands of HCWs**
- Hands contaminated after contact with residents, contact with environment, contact with contaminated equipment

**BUT...**

- Easily washed off hands!
- Easily killed with Alcohol Based Hand Rub (ABHR)!
- Easily killed with healthcare grade disinfectants!

*i.e. Routine Practices!*
Control of MRSA

In General:

• Routine Practices

• **Acute care** - Contact precautions used for entry into room

• **LTC/RH/home care** - Routine practices, **add contact precautions for direct care**

  “Providing hands-on care, such as bathing, washing, turning client/patient/resident, changing clothes/diapers, dressing changes, care of open wounds/lesions or toileting. 
  
  *Feeding and pushing a wheelchair are not classified as direct care*”
Control of MRSA

• Environmental Cleaning
  • Can survive on environmental surfaces easily for long periods of time
  • No special cleaning required, but meticulous daily cleaning using an approved disinfectant is necessary

• Laundry
  • No special laundry required, clothes and linens may be included in regular laundry
  • Wear gloves when handling linens and proper hand hygiene

• Garbage
  • No special disposal of garbage required
• Vancomycin Resistant *Enterococci*
Enterococci

VS

Vancomycin Resistant Enterococci (VRE)

POOP!
Risk Factors for VRE

• Length of hospital stay
• Antibiotic use
• Presence of invasive device
• Severity of underlying illness
• Prior colonization with VRE
• Close proximity to a colonized client/patient/resident
VRE Transmission

• VRE can be transmitted:
  • On the hands of caregivers
  • Through contaminated surfaces and equipment

BUT...

• Easily washed off hands!
• Easily killed with ABHR!
• Easily killed with hospital grade disinfectants!

i.e. Routine Practices!
Control of VRE

In General:

• **Routine Practices**

• **Acute care** - Contact precautions used for entry into room

• **LTC/RH/home care** - Routine practices, **add contact precautions for direct care**

  “Providing hands-on care, such as bathing, washing, turning client/patient/resident, changing clothes/diapers, dressing changes, care of open wounds/lesions or toileting.

  *Feeding and pushing a wheelchair are not classified as direct care*”
Control of VRE

• Environmental Cleaning
  • Can survive on environmental surfaces easily for long periods of time
  • No special cleaning required, but meticulous daily cleaning using an approved disinfectant is necessary
  • **Consider twice daily cleaning of resident rooms**

• Laundry
  • No special laundry required, clothes and linens may be included in regular laundry
  • Wear gloves when handling linens and proper hand hygiene

• Garbage
  • No special disposal of garbage required
Extended-Spectrum Beta-Lactamase producing bacteria

Image source: National Institutes of Health
Extended-Spectrum Beta-Lactamase (ESBL)

- Bacteria that produce an enzyme, beta-lactamase
- Beta-lactamase has the ability to breakdown commonly used antibiotics such as penicillin and cephalosporins
- Most people who have ESBL-producing bacteria are colonized with it, NOT infected
- Most common ESBL-producing bacteria are some strains of *Escherichia coli* and *Klebsiella pneumoniae*
- Lower gastrointestinal tract is main reservoir for these bacteria in colonized patients

**POOP!**
Risk Factors for ESBL

- Length of hospital stay
- Antibiotic use
- Presence of invasive device
- Severity of underlying illness
- Prior colonization with ESBL
- Close proximity to a colonized client/patient/resident
ESBL Transmission

- ESBL can be transmitted:
  - On the hands of caregivers
  - Through contaminated surfaces and equipment

BUT...

- Easily washed off hands!
- Easily killed with ABHR!
- Easily killed with hospital grade disinfectants!

i.e. Routine Practices!
Control of ESBL

In General:

• Routine Practices

• **Acute care** - Contact precautions used for entry into room

• **LTC/RH/home care** - Routine practices, **add contact precautions for direct care**

  “Providing hands-on care, such as bathing, washing, turning client/patient/resident, changing clothes/diapers, dressing changes, care of open wounds/lesions or toileting.

  *Feeding and pushing a wheelchair are **not** classified as direct care*”
Control of ESBL

• Environmental Cleaning
  • Can survive on environmental surfaces easily for long periods of time
  • No special cleaning required, but meticulous daily cleaning using an approved disinfectant is necessary

• Laundry
  • No special laundry required, clothes and linens may be included in regular laundry
  • Wear gloves when handling linens and proper hand hygiene

• Garbage
  • No special disposal of garbage required
Summary

• Ignore the acronym!
• MRSA, VRE, ESBL
  • Same risk factors
  • Same transmission
  • Same control methods
  • Same recommendations against decolonization

Routine Practices + Contact Precautions for direct care
Stay Safe!
Thank you!
References

• Routine Practices and Additional Precautions in All Health Care Settings, 2012, PIDAC
  [Link to PDF]

• Annex A: Screening, Testing and Surveillance for Antibiotic-Resistant Organisms (AROs) in All Health Care Settings, 2013, PIDAC
  [Link to PDF]