

Multi Drug Resistant Organisms

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Multi Drug Resistant Organisms

- MDRO organisms which exhibit resistance to one or more classes of antimicrobials

Staphylococcus aureus

- MRSA
- VISA
- VRSA

VRE

Multidrug Resistant Gram Negative Bacilli

- *Acinetobacter baumannii*
- *Stenotrophomonas maltophilia*
- ESBL-gram negative bacilli

Clostridium difficile

Illnesses caused by MDRO's

- The spectrum of disease may range from colonization to sepsis.

Factors Which May Contribute to the Development of MDRO

- Selective pressure
- Poor compliance with infection control practices
- Increased rates of community colonization

Selective Pressure

Genetics of Antibiotic Resistance

- **Point mutation** – alterations in the target site of an antimicrobial agent interfering with the activity providing array of extended spectrum B-lactamases
- **Rearrangement of large sequences of DNA** (inversion/duplication/insertions/deletions/transposition)
- **Acquisition of foreign DNA** (carried by plasmids/bacteriophages)

Control of Antibiotic Resistance Prevention of Selection

- Limited use of antibiotics in animal husbandry
- Antimicrobial management strategies

Antimicrobial management strategies

- Education
- Prior approval programs
- Streamline and switch therapies
- Formulary restriction

Antimicrobial Management Strategies

Antimicrobial formulary restrictions

1. Determine which antimicrobials to control
2. Develop method to achieve control
3. Who is responsible for maintaining control
4. Enlist help
5. Measurement of control
6. Method to ensure clinical care will not be harmed

Factors which may contribute to the development of MDRO

Poor Compliance With Infection Control Measure

- Hand hygiene
- Isolation techniques
- Maximal barrier techniques
- Excessive catheter days

Hand Hygiene

- Reduce infections in the healthcare setting and promote patient safety.
- Alcohol products
- Soap and water

Hand Hygiene

- 1840's – link between hand hygiene and puerperal fever
- 1961 – US Public Health Service produces a training film on hand washing
- 1975 CDC publishes formal guidelines

Infection control measures

Standard precautions

- Hand washing
- Gloves
 1. Prevent gross contamination with body fluids
 2. Reduce exposure to blood-borne pathogens
 3. Decrease transmission of organisms
 4. Reduce hand contamination by 70-80%

Isolation measures

- Airborne
- Droplet
- Contact

Infection control measures

- Maximal barrier techniques for central line placement.
- Decrease number of catheter days

Factors which may contribute to development of MDRO

- Increased rates of community colonization

The Effects of MDRO's Increase

- Mortality
- Length of stay
- Cost

Famous Four MDRO's

- Staphylococcus aureus
- Enterococcus
- Gram negative bacilli – MDR
- Clostridium difficile

MRSA

- Gram positive cocci
- Reported in USA 1968
- Oxacillin resistance

MRSA

- Bill HJR0003 Illinois General Assembly
 1. Urges CDC to adopt guidelines for universal testing in hospital patients
 2. February 2007-House recommends adoption
 3. Placed on calendar for resolution

Rapid Test Methods for MRSA

- PCR for screening
- Tests for early identification

VRE

- Gram positive cocci
- First reported in US 1989
- Vancomycin resistance is an independent predictor of death
- 2004 – CDC reported 1 in 3 infections in hospital ICU's

Multidrug Resistant Gram Negative Bacilli

- Stenotrophomonas
- ESBL gram negative bacilli
- Acinetobacter

Acinetobacter

- Gram negative bacilli
- Ubiquitous opportunistic organism
- Environmentally tolerant (some strains found in sink basins are soap tolerant)

Who Is At Risk?

- Community acquired
 1. ETOH
 2. DM
 3. COPD
 4. ESRD

Who is at risk?

Hospital acquired

1. VDRF
2. Recent surgery
3. ICU patients

Clostridium difficile

- Gram positive bacillus
- Discovered in 1935
- Associated with disease in 1978
- Produces exotoxins which are pathogenic
- 2-3% pf adults are carriers with no symptoms

Transmission of MDRO'S

- Hands of health care providers
- Inanimate objects
- Colonized health care providers

Persistence of MDRO'S

- Vulnerable patients
- Selective pressure
- Large numbers of colonized patients
- *Poor compliance with infection control measures!*

Infection Control

- Recognition
- Implementation of appropriate strategies
- Evaluation of effectiveness

What Makes MDRO Management Possible?

- Infection prevention
- Control data collection
- Adherence monitoring
- Laboratory support
- Staff commitment
- Administrative support
- Support staff

THANK YOU