

Infection Control

Bonita Biegelke, Ph.D.

Ohio University College of
Osteopathic Medicine

Objectives

- Infection prevention measures
 - What works
- Multiple drug resistant organisms
 - MRSA in health care settings
- Blood-borne infections
 - rates, prevention, treatment

Overview: Healthcare –associated infections

- 1.7×10^6 infections/year
- 99,000 deaths
- 32% UTI
- 22% SSI
- 15 % pneumonia
- 14% blood

Standard Precaution - Infection Control

- Hand hygiene
- Use of gloves
- Masks
- Gowns
- Boots
- Environmental Control

Standard Practices

- Variable adherence
- Increase in years of experience – negative predictor



Hand Hygiene

- Single most important practice
- Transient versus resident flora
- Antiseptic handwashing



Hand washing solutions

- Alcohol-based products are more effective than
 - Antimicrobial soaps
 - Soaps
- Efficacy is influenced by volume and time

Adherence to hand-hygiene guidelines

- Influenced by ward type
- High intensity of patient care
- staff:patient ratio
- Easy access to hygiene supplies
- Alcohol-based rub

Fingernails and artificial nails

- Fresh nail polish versus chipped nail polish
- Increase in pathogens associated with artificial nails

Jewelry

- Increase in bacteria on skin under rings
- Risk factor for carrying gram-negative bacilli, *S. aureus*

Surgical Hand Antisepsis

- Preoperative scrubbing with antiseptic is preferential over regular soap
- Persistent antimicrobial activity is desirable
- 5 minute scrub is sufficient

Use of gloves

- Recommendation for use when coming in contact with blood, non-intact skin, mucous membranes, MRO
- Effective at preventing HCW hand contamination
- Types of gloves



Protective Clothing

- One small study – cover gowns and shoe covers provided no significant reduction in time to antibiotic treatment.

- Oncol. Nurs. Forum 26:1319

Environmental Contamination

- Patient gowns, bed linen, bedside furniture
– contaminated with patient's flora
- Source of HCW hand/glove contamination
- Markers labeling surgical site

Surgical Site Infections

- Infectious countermeasures – beneficial
- Absorbable sutures
- Antibiotic prophalaxis
- Optimize host defenses

Surgical Site Infections – Risk Factors

- Bacterial factors – virulence, resistance
- Host factors
- Surgical Site factors

Host factors – Surgical site infections

- Ages
- Concurrent illness
- Length of stay
- Appropriate use of antibiotics
- Nutritional status
- Preexisting infection

Venous Catheters

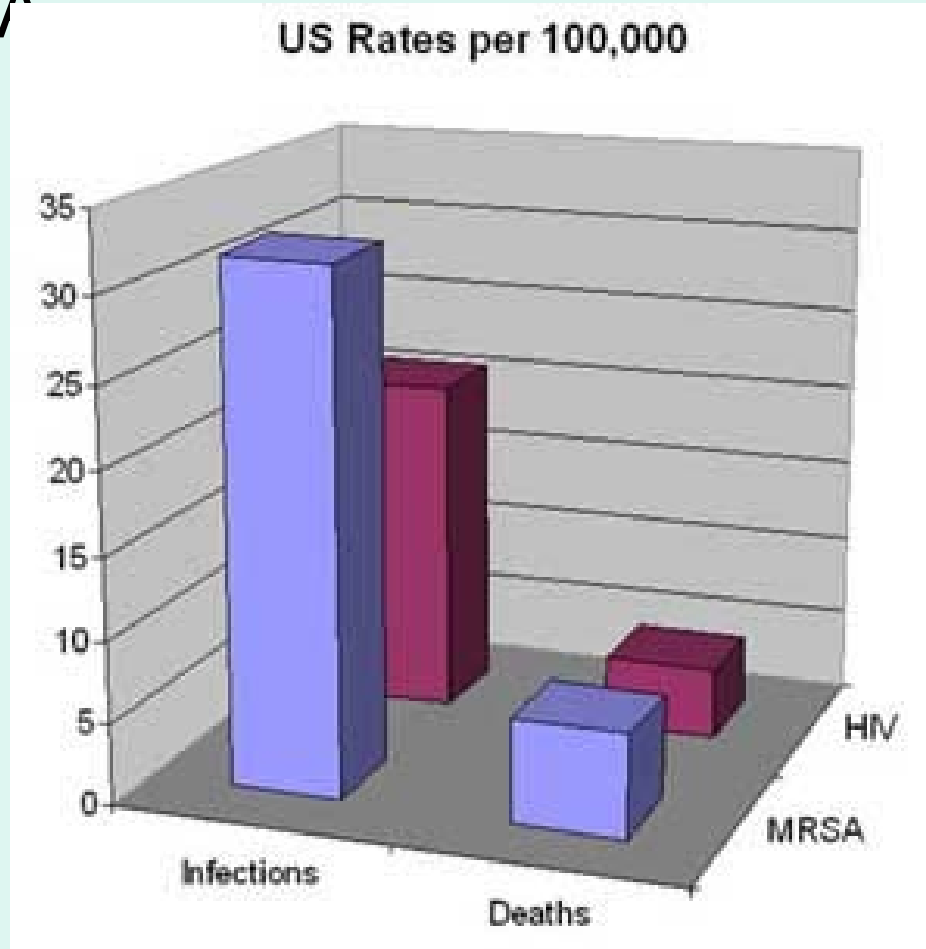
- Best Practices
 - Hand hygiene
 - Maximal barrier precautions
 - Chlorhexidine skin antisepsis
 - Optimal Placement
 - Daily review for need

Central Catheters

- 5.3 catheter-related infections/1000 catheter days
- 18% mortality rate
- Cost of \$3,700-\$29,000

Multiple Drug-resistant Organisms

- MRSA
- VRE



MRSA

- Community-acquired MRSA
 - Single isolate, readily transmitted



Reduction of MRSA

Hand hygiene

Colored isolation gowns

Separate supplies

Surveillance

Pre-admission MRSA screening

Blood borne infections

- Pathogens
 - HBV
 - HCV
 - HIV

Factors influencing infection

- The pathogen involved
- The type of exposure
- The amount of blood involved in the exposure
- The amount of virus in the patient's blood at the time of exposure

Prevention

- Safe practices
- Barrier protection

HBV infection

- If vaccinated, little chance of infection
- Unvaccinated
 - 6-30%
 - Dependent on HBeAg status of individual
- Prevention
 - Immunization, testing to verify immune status

HCV infection

- 1.8%
- No treatment, no immunization available

HIV infection

- Needlestick or cut – 0.3%
- Eye, nose or mouth blood splash, non-intact skin – 0.1%
- Treatment if exposed