Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

The Epidemiology of Healthcare-Associated Infections (HAIs) in Long Term Care

UNIT IV – HAIs seen in NH/SNFs



Eddie Hedrick BS, MT(ASCP), CIC
Emerging Infections Coordinator
Bureau of Communicable Disease Control & Prevention
Missouri Department of Health & Senior Services
Eddie.Hedrick@health.mo.gov
573-864-5317

Other Control Techniques

- Clinical Practices - Policy & Procedures (P&P) regarding
  - e.g., isolation, use and care of devices (foley catheters, IVs, respirators, transducers, etc.)
- Employee health practices
  - Health screening immunizations
    - e.g., TB, etc.
  - Post exposure management
    - e.g., needle stick, splash mucous membrane
  - Policies for not working with specific conditions
    - e.g., weeping dermatitis on hands could infect you and resident, both

Other Control Techniques

- Environmental cleanliness
  - P&P for cleaning, disinfection, sterilization and maintenance , Infectious Waste Disposal
  - Daily room cleaning
  - Pay close attention to “High Touch” surfaces such as bedside tables, bed rails, IV poles, bathroom surfaces.
  - Use EPA approved disinfectant in proper dilution and for proper contact time.
  - Always remember **cleaning is a pre-requisite** to disinfection or sterilization.

Urinary Tract Infections

- The most commonly reported and treated infection in NH/SNF residents
  - Avg. indwelling catheter use is approx. 5% therefore majority of UTIs **not** catheter associated!
  - Many develop weakened pelvic muscles, urinary retention, incomplete emptying, and bacterial colonization.

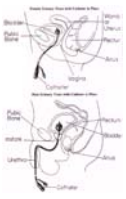
Urinary Tract Infections

- If you don’t differentiate between Asymptomatic Bacteruria from Symptomatic UTI = antibiotic overuse!
- Antibiotic overuse increases adverse events, & complications such as *Clostridium diff.*, & the emergence & transmission of multi drug resistant organisms (MDROs).

Risk Factors for Catheter-associated UTIs (CAUTIs)

1. Length of time of catheterization
2. Colonization of the drainage bag
3. Host factors:(i.e. Female gender, Diabetes mellitus, uremia)
4. Improper catheter care





Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Prevention

- Eliminate or restrict catheterization
- Other methods - condom catheters, intermittent catheterization, supra-pubic catheterization and urinary diversion surgery
- Limit length of catheterization
- Keep system closed

Lower Respiratory Tract Infections

- **Risk factors for LRI**
  1. **Previous use of Antibiotics**
  2. **Surgery**
  3. **COPD**
  4. **Advanced age**
  5. **Immunosuppression**



LOWER RESPIRATORY TRACT INFECTIONS (LRTIs)

- Increased risk of aspiration due to:
  - declining oral hygiene
  - difficulty swallowing
  - diminished cough reflex, especially in those with neurologic conditions
- Increased risk of pneumonia due to:
  - underlying conditions such as COPD & Asthma.

LOWER RESPIRATORY TRACT INFECTIONS (LRTIs)

- LRTI attack rate in NH/SNF residents
  - 33/1000 residents vs 1.4/1000 residents in community
- Yr. 2000-2002 leading cause of hospitalization & death in people >65.
- Pneumonia -5th leading cause of death in people >65
  - *Strep pneumonia* (bacteria) is most frequent cause of pneumonia.

LOWER RESPIRATORY TRACT INFECTIONS (LRTIs)

- Difficult to diagnosis
  - Presentation atypical – only evidence might be malaise, anorexia, non-specific muscle weakness, behavioral changes, weight loss.
  - May have little cough, no fever, & few changes in the bedside exam.
  - Altered mental state may be the most common presenting symptom in 40% of those with bacterial pneumonia.

Lower Respiratory Tract Infections

- The most dangerous HAI with a high case fatality rate.
- Endotracheal intubation and tracheostomy are the **major risk factors** for nosocomial LRI. (both dry the lower respiratory tract mucous and provide entry for microbes.)
- Ventilators and nebulizers also increase the risk (contaminated solutions).

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Pneumococcal Disease


- Most common form of community-acquired pneumonia in the elderly
  - 60% of all cases
  - 20% of HAI pneumonias
  - Elderly have highest pneumococcal bacteremia rates of any population group
    - 50 per 100,000 persons>65 (3X greater than rates for younger persons)
    - Death rates range from 20-80%, increasing with age & complications

Pneumococcal Disease


- Streptococcus pneumonia
  - Over 90 serotypes
  - Causes pneumonia, bronchitis, bacteremia and meningitis
  - Very costly in elderly – require hospitalizations and complications

Pneumococcal Disease


- Antibiotics are helpful – sometimes!
- Death & complications often occur despite prompt use of antibiotics.
- Only preventative measure available – vaccine.
- 70% effective in the elderly.
- Only needs to be given once in most persons!
- Give to anyone over 50 (Medicare part B will pay for it.)

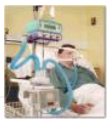
Influenza in the Elderly

- Influenza leads all other disease categories in terms of restricted activity & bed delays.
- Elderly consistently have the highest hospitalization & death rates of any population group.
- Even in mild years there are > 20,000 excess deaths from flu in U.S. – 80-90% occur in the elderly.
- Flu complications – pneumonia (viral & bacterial) and cardiac respiratory failure.

Influenza in the Elderly

- Long recovery time in those who do get well.
- Largely unnecessary – vaccines available since the 1960's.
- Reduces risk or decreases severity.
- Very cost-effective, even in elderly.
- Some anti-virals available for Influenza A viruses.

Prevention (examples)



- Vaccination
- Handwashing
- Aseptic technique
- Good oral hygiene
- Decontamination of respiratory equipment
- Bed elevation

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

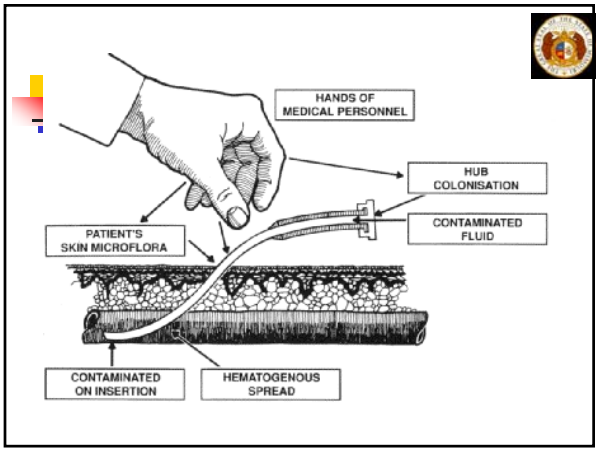
Blood-Stream Infections (BSIs)

- Although rarely detected in LTCFs can be classified as primary or secondary.
  - **Primary**: occurs without any infection in other sites.
  - **Secondary**: the presence of infection in a site such as urinary tract, or LRI can lead to a blood stream infection with the same organism.
  - As acuity of illness in LTC residents has increased so has the use of intravascular devices.

Healthcare-Associated BSIs

- BSIs are often associated with vascular catheter usage, especially long term indwelling central lines.
- More than 250,000 central line-associated BSIs (CLABSIs) in US yearly.
  - These catheters may be contaminated due to:
    - contaminated antiseptics used to clean the skin,
    - contaminated hands of health care personnel,
    - infections following hematogenous seeding or external colonization.

Pittet et al. JAMA 1994; 271 1598-1601.
Klevens et al. Public Health Reports 2007;122:160-6.



Staphylococcal Biofilm

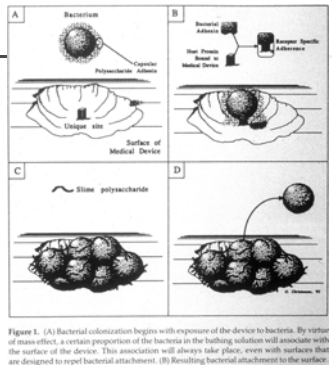
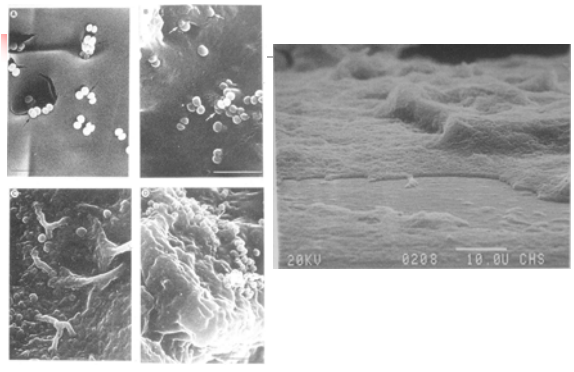


Figure 1. (A) Bacterial colonization begins with exposure of the device to bacteria. By virtue of mass effect, a certain proportion of the bacteria in the bathing solution will associate with the surface of the device. This association will always take place, even with surfaces that are designed to repel bacterial attachment. (B) Resulting bacterial attachment to the surface

Staphylococcal Biofilm



Skin and Soft-Tissue Infections

- **Decubitus Ulcers** – Occur in 20% of LTCF residents and are associated with increased mortality. (osteomyelitis, bacteremia = 50% mortality)
- **Risk factors** – immobility, pressure, friction, shear, moisture, malnutrition, steroids, infection, reduced nursing time.
- **Prevention** = nutrition, preventing fecal incontinence, plan for turning, eliminating focal pressure, keeping skin dry.

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Gastro-Intestinal Infections

- Viral gastroenteritis (rotavirus, enterovirus or norovirus)
- Bacterial gastroenteritis (B.cereus, E.coli, Campylobacter, Salmonella, Shigella)
- Clostridium difficile is becoming the #1 cause of diarrhea in NH/SNF residents accounting for more than 50% of all GI illness reported in Penn. NHs in 2009.

Clostridium difficile Infection (CDI)

- It is estimated that more than half of all HAI CDI cases will manifest in NHs: reported rates are between 1.7-2.9/10,000 resident days.
- Antibiotic induced diarrhea
- May cause approximately 30% of all cases of healthcare associated diarrhea.
- Disease may be mild or cause life threatening pseudomembranous colitis.
- Increasing numbers of cases
  - Cases tripled in US hospitals from 2000 until 2005.
- Increasing disease severity and mortality.

Clostridium difficile Colonization vs Infection

- Colonization: presence of microorganisms without tissue invasion or damage, therefore no signs or symptoms
- Colonization rate of *C. difficile*
  - About 10-25% of hospitalized patients
  - About 4-20% of long term care residents
  - Antibiotic therapy may disrupt normal colonic flora in colonized patients and *C. difficile* proliferates, producing toxins and symptomatic disease
- Infection: presence of microorganisms with tissue invasion and damage, therefore signs or symptoms

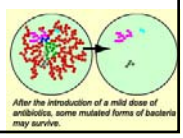
Tiered Approach to *Clostridium difficile* Infection (CDI) Transmission Prevention

- Basic/Core/Routine Approach: *C. difficile* transmission prevention activities during routine infection prevention and control responses
- Enhanced/Supplemental/Heightened Approach: *C. difficile* transmission prevention activities during heightened infection prevention and control responses
  - Evidence of
    - ongoing transmission of *C. difficile*
    - an increase in CDI rates and/or
    - evidence of change in the pathogenesis of CDI (increased morbidity/mortality among CDI patients)

    despite routine preventive measures

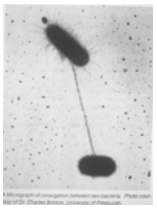
Rapid Rise in Antibiotic Resistance

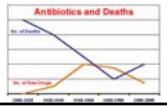
- MRSA
  - Healthcare acquired MRSA (HAMRSA)
  - Community acquired MRSA (CAMRSA)
- Vancomycin Resistant Enterococci (VRE)
- Carbapenemase Resistant Enterobacteriaciae (CRE)
  - NDM 1
  - KPCs



Rapid Rise in Antibiotic Resistance - Reasons

- Overuse/Misuse (Human and animal)
  - Used when not needed
  - Wrong drug for the bug
  - Wrong dose
  - Improper duration
  - Public perceptions





Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Antibiotics (Ab) in NH/SNFs

- 40% of systemic drugs prescribed in LTCFs.
- Odds that a resident will receive a systemic course of antibiotics during one yr. period is 50-70%.
- Studies suggest that 25-75% of systemic Ab use may be inappropriate in LTCFs.

What Can Be Done?

- **Can not stop** microorganisms from becoming resistant!
- **BUT** – can slow the process down through:
  - **Antibiotic stewardship-** need for the Ab, right drug for the bug, right dose, right duration, and right route of administration.
  - **Education** of the health care community and the public.

CDC's 12 Steps to prevent Ab. Resistance Among LTC Residents

PREVENT INFECTION

1. VACCINATE – flu and pneumococcal vaccine to all residents, Promote vaccination among all staff.
2. PREVENT ALL CONDITIONS THAT LEAD TO INFECTION –Prevent aspiration, pressure ulcers, maintain hydration.
3. GET THE UNNECESSARY DEVICES OUT! – Insert catheters and devices only when essential and minimize duration, use proper insertion and care protocols, remove when no longer essential.

CDC's 12 Steps to prevent Ab. Resistance Among LTC Residents

DIAGNOSE AND TREAT INFECTION EFFECTIVELY

4. USE ESTABLISHED CRITERIA FOR DIAGNOSIS OF INFECTION – Target empiric therapy to likely pathogens, obtain cultures and interpret results with care, consider C. difficile in patients with diarrhea and antibiotic exposure.
5. USE LOCAL RESOURCES – Consult ID experts for complicated infections & potential outbreaks, know your local and regional data, get previous micro data for transfer residents.

CDC's 12 Steps to prevent Ab. Resistance Among LTC Residents

USE ANTIMICROBIALS WISELY

6. KNOW WHEN TO SAY "NO" – Minimize broad spectrum antibiotics, avoid long term ab prophylaxis, develop a system to monitor antibiotic use and provide feedback to appropriate personnel.
7. TREAT INFECTION,NOT COLONIZATION OR CONTAMINATION – Collect specimens properly, Re-evaluate the need for continued therapy after 48-72 hrs, Do not treat asymptomatic bacteruria.
8. STOP ANTIMICROBIAL TREATMENT – When cultures are negative, & infection is unlikely, and when infection has resolved.

12 Steps to prevent Ab. Resistance Among LTC Residents

PREVENT TRANSMISSION

9. ISOLATE THE PATHOGEN – Use Standard Precautions, Contain infectious body fluids
10. BREAK THE CHAIN OF CONTAGION – Follow CDC recommendations for work restrictions & stay home when sick, Cover your cough or sneeze, educate staff, residents, and families.

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

12 Steps to prevent Ab. Resistance Among LTC Residents

PREVENT TRANSMISSION

11. PERFORM HAND HYGIENE – Use alcohol-based handrubs or wash your hands, encourage staff or visitors.
12. IDENTIFY RESIDENTS WITH MDROs – Identify both new admissions & existing residents with MDROs, follow standard recommendations for management.

Clostridium difficile

- Anaerobic spore-forming bacillus
- Pseudomembranous colitis, toxic megacolon, sepsis, and death
- Fecal-oral transmission through contaminated environment and hands of healthcare personnel
- Antimicrobial exposure is major risk factor for disease

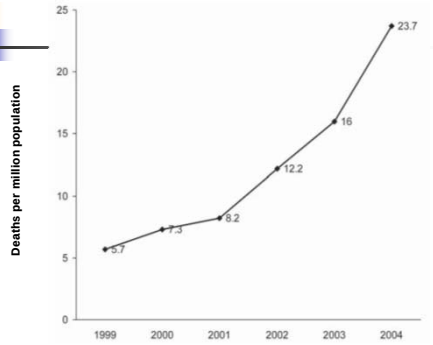
Healthy colon

Pseudo-membranous colitis

Changing Epidemiology of CDI

- Increasing incidence and severity
  - Based on NNIS, national hospital discharge data, reports from healthcare systems, death certificate data
- Recent outbreaks of severe disease caused by epidemic strain of *C. difficile* with increased virulence, antibiotic resistance
- Although elderly are still most greatly affected, more disease reported in "low-risk" persons
  - Healthy persons in community, peripartum women

Yearly *Clostridium difficile*–related Mortality by Listing on Death Certificates, United States, 1999–2004



From Redelings MD, et al. *Emerg Infect Dis.* 2007;13:1417-1419.

Public Reporting in Ohio, 2006

Relative importance of long-term care setting

Approximately 14,100 cases

- Hospital onset
  - ~5,000 initial cases; 7–8 per 10,000 patient-days
  - ~1,200 recurrent cases; 1–2 per 10,000 patient-days
- Long-term care facility onset
  - ~4,800 initial cases; 2–3 per 10,000 patient-days
  - ~3,100 recurrent; 1–2 per 10,000 patient-days

Ohio Department of Health. http://www.odh.ohio.gov/alerts/cdiff1.aspx

Outcomes of CDI in Setting of Endemic Disease

- Excess costs
  - $2,380 to $3,240 per index hospitalization
  - $3,797 to $7,179 inpatient costs over 180 days of follow-up
- Other outcomes
  - 2.8 days attributable excess length of stay
  - 19.3% attributable readmission (180 days)
  - 5.7% attributable mortality (180 days)
  - More likely discharged to long-term care

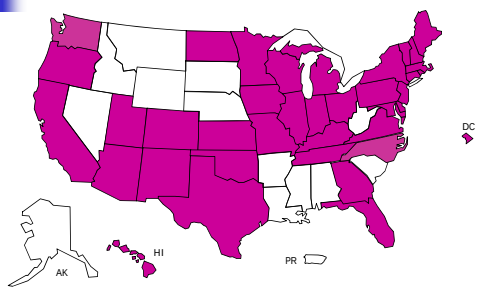
Dubberke ER, et al. *Clin Infect Dis.* 2008;46:497-504.
Dubberke ER, et al. 17th Annual Meeting of The Society for Healthcare Epidemiology of America (SHEA), April 14-17, 2007; Baltimore, MD. Unpublished data.

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Current Epidemic Strain of *C. difficile*

- BI/NAP1/027, toxinotype III
- Historically uncommon, now epidemic
- Current strain more resistant to fluoroquinolones
- Carries extra toxin known as binary toxin
- Polymorphism in toxins A and B regulatory gene (*tcdC*) and increased toxin production *in vitro*

States with BI/NAP1/027 Strain of *C. difficile* (N=38), November, 2007



Why the increase in the number of *C. difficile* cases?

- Better case ascertainment
- Aging population
  - Decline with age in bifidiobacterium, an organism important in colonization resistance, in gut flora may create more permissive environment for *C. difficile*

Why the increase in the number of *C. difficile* cases?

- Increased use of antimicrobials especially fluoroquinolones with anti-anaerobic activity to which *C. difficile* is resistant
  - This is being debated in the infectious disease community
  - 90% of *C. difficile* isolates are fluorquinolone resistant

Why the increase in the number of *C. difficile* cases?

- Increased contamination of health care setting with *C. difficile* spores making infections more likely
  - Cleanliness of British Public Health Service hospitals has become a major political issue there
- Shared rooms and bathroom facilities
  - Particular issue in Canada and Britain

Laboratory diagnosis of *C. difficile*

- What is the gold standard for *C. difficile* diagnosis?
  - Presence of toxin as measured by tissue culture toxicity
  - Presence of toxigenic organisms
    - Can not use culture alone because 20-25% of strains may be non-toxigenic (the range for different institutions may be quite different)
  - Combination of the two tests (SHEA recommendation)

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Laboratory diagnosis of *C. difficile*

- Because of the complexity of the tissue culture assay, the laboratory diagnosis is made in over 75% of US labs using an enzyme immunoassay that detects either toxin A or toxin A & B.
- This test has a sensitivity of between 75 and 90 % with high specificity
  - High specificity means there are few "false positives" with this test and that the test has a high positive predictive value

Treatment of *C. difficile* disease

- Initial studies showed that metronidazole and vancomycin had similar initial response to therapy (90%) and similar disease recurrence rates (5 to 12%)
- Metronidazole became the drug of choice because it was much cheaper and because of concerns of vancomycin use resulting in increased rates of VRE and concerns about the emergence of VRSA

Treatment of *C. difficile* disease

- Two recent studies (published 6/05) have shown much higher rates of treatment failures/recurrences than previously reported with metronidazole
  - One study (CID 40:1586, 2005) only 50% of patients were cured, 22% had symptoms continuous for $\geq$ 10 days and 28% had recurrences

Treatment of *C. difficile* disease

- In a Canadian survey (Pepin et al. CID 40:1591-7), recurrence rates increased from 21% in 1991-2002 to 48% in 2003-2004; in those over 65 y.o., that rate was close to 60% in 2003-4

Treatment of *C. difficile* disease

- Whether resistance to metronidazole is the reason is not reported in these studies; although there are data suggesting drug resistance is not the reason for this observation

The problem of recurrence of *C. difficile* disease

- Molecular epidemiology studies have shown that recurrences of *C. difficile* can be:
  - due to **relapse**- a second or third episode of *C. difficile* due to the patients own organism or
  - **re-infection** obtaining a new strain from the patient's environment. (each occurs in approximately 50% of patients)
  - Failure to develop colonization resistance thought to play a crucial role in recurrences

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

The problem of recurrence of *C. difficile* disease

- Re-population of gut with fecal flora via naso-gastric tube called a **stool transplant** was highly effective in a small study (18/19) who had had recurrences of CDAD
- Use of pro-biotics such as lactobacilli or *Sacchromyces* has not been particularly impressive to date in re-populating the gut to prevent recurrences

Staphylococcus aureus

HISTORY

- Penicillin 1st used in 1941
- 1st description of penicillinase producing S. aureus in 1944
  - Hospitalized patients first, then other health care environments & then the community.
  - Resistance grew with the increased use of penicillin & within a few years most

HISTORY

- Rates of resistance in the community followed.
  - Community strains resistant only to penicillin whereas hospital strains were resistant to multiple antibiotics.
  - By 1972, 47% of healthy school aged kids <10 years old were S. aureus carriers 68% were colonized with Pen-Resistant strains.
  - Today > 95% of Staphylococcal infections worldwide are Pen-Resistant.

History

- 1959 – Methicillin introduced in response to penicillin resistance
- 1970s – First cases of MRSA recognized –(defined as MIC≥4ug/ml)
  - Implies resistance to all beta-lactam antibiotics (Kefzol, Fortaz, Zoxyn etc.
  - Most MRSA at this time were nosocomial (HAMRSA)

History

- 1990s – Community acquired MRSA (CAMRSA) emerged – different, susceptible to many antibiotics
- MRSA can be from community or hospital

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Staphylococcus aureus Epidemiological points

- Resident flora and important pathogen
- Sticks to nasal mucosa better than skin = nares is primary colonization site
- Of people who colonize:
  - 30% colonize nares (range 19-40%)
  - 15% perineum
  - 2-7% axilla
  - 1-5% toe webs

Staphylococcus aureus

- Common on skin or in nose
- 25-30 of healthy colonized, 1% colonized with MRSA
- Most S. aureus infections mild but can be serious
- MRSA is a sub-set of SA resistant to beta-lactams

HAMRSA

- Today >50% of SA in most hospitals in U.S.
- Increasing over past 10-20 years

CAMRSA

- Defined as not being in healthcare the last year or had a procedure
- Diagnosed in the out patient setting or by culture within 48hrs of admission
- No hx of MRSA
- No hx of hosp., NH, dialysis, surgery in the last year

CAMRSA

- No IV or devices
- First reports in Australian aboriginals and native Americans in early 1990s
- No prior contact with healthcare
- Been increasing in those groups ever since

Epidemiology CAMRSA

- Clusters identified in athletes, military, children in daycare, prisoners, MSM
- Close skin to skin contact, cuts/abrasions, contaminated items, crowded, poor hygiene
- Increased risks with chronic skin conditions such as eczema
- 5 C's – crowding, contact, compromised skin, contaminated surfaces, cleanliness

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Epidemiology CAMRSA

- Transmission by hands, skin-to-skin contact
- 2003 study: 12% of all MRSA are CAMRSA
- Incidence rates from 26/100,000 to 18/100,000
- 77% skin infections, 10% wound infections, 4% UTI, 3% bacteremic, & 2% pneumonia
- 23% require hospitalization: 10% required ICU
- 84% of skin infections in Illinois CMRSA

Contrasts of HAMRSA & CAMRSA

- Different mec gene
- Different suceptibility
- Mean age 23 vs 68 for HAMRSA
- Soft tissue in 75% vs 37% for HAMRSA

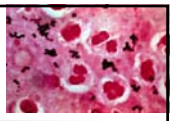
Patient issues CAMRSA

- Colonization & infection: MRSA colonized had about 20% develop MRSA infection in 1 year vs 1% of those not colonized (same a MSSA)

Clinical Presentation CAMRSA

- Skin or soft-tissue infection – boil or abscess
- Spider bite – red swollen, painful
- BSI or pneumonia
- Several reports of CAMRSA necrotizing fasciitis

Current Concern



- Community – acquired MRSA is now being transmitted in healthcare settings
- Not as resistant as HAMRSA but toxin producer that if not treated promptly can cause serious disease.

Prevention direction

- Keep hands clean
- Keep cuts and scrapes clean and covered
- Avoid contact with other wounds or bandages
- Avoid sharing personal items
- Environment is less crucial – routine housekeeping

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

Summary

- Rapidly expanding
- Different than HAMRSA
- Affects healthy people with skin abscesses
- Some sub-groups at increased risk
- Sensitive to many more antibiotics but not usual abscess antibiotics

Principles and Control measures

- Residents colonized or infected with antibiotic-resistant organisms should be provided the same quality of care as other clients.
- Antibiotic-resistant bacteria such as MRSA and VRE are primarily transmitted from person to person on the hands of other people or from contaminated shared items.



TB Testing Requirements

Long-Term Care Residents

Within one month prior to or one week after admission, all residents new to long-term care are required to have the initial test of a Mantoux PPD two step tuberculin test. If the initial test is negative, zero to nine millimeters the second test, which can be given after admission, should be given one to three weeks later. Documentation of chest X ray evidence ruling out tuberculosis disease within one month prior to admission, along with an evaluation to rule out signs and symptoms compatible with infectious tuberculosis, may be accepted by the facility on an interim basis until the Mantoux PPD two (2)-step test is completed

TB Testing (Cont.)

(A) All skin test results are to be documented in millimeters (mm) of induration.

(B) Bacillus of Calmette and Guerin (BCG) vaccination shall not prevent residents from receiving a tuberculin test.

(C) A reaction of ten millimeters or more shall be considered as infected with *Mycobacterium tuberculosis for an individual* with a history of BCG vaccination.

TB Testing (Cont.)

(D) Evidence of tuberculosis infection is considered to be a reaction of five millimeters or more for all contacts to infectious tuberculosis or for an individual who is immunosuppressed or has abnormal chest X-ray findings consistent with old healed tuberculosis disease, and ten millimeters or more for all others.

(E) Residents with a negative, zero to nine millimeters Mantoux PPD two-step test need not be routinely retested unless exposed to infectious tuberculosis or they develop signs and symptoms which are compatible with tuberculosis disease.

TB Testing (Cont.)

(F) Residents with a documented history of tuberculosis infection or an adequate course of preventive treatment shall not be required to be retested. Residents with a documented history of tuberculosis disease and adequate chemotherapy shall not be required to be retested. In the absence of documentation, a repeat test shall be required.

Eddie Hedrick BS, MT(ASCP), CIC
Eddie.Hedrick@dhss.mo.gov

TB Testing (Cont.)

(G) All skin test results of five millimeters or more for contacts to infectious tuberculosis or for an individual who is immunocompromised, or ten millimeters or more for all others, shall require achest X ray within one week, or a review of the results of a chest X ray taken within the month prior to admission along with an evaluation to rule out signs and symptoms compatible with tuberculosis disease to rule out active pulmonary disease.

(H) Individuals with a positive finding presenting evidence of a recent, within one month of the date of admission, chest X ray need not be given a new X ray. However, the results of the X ray must be reviewed in the light of the additional information of the identification of tuberculosis infection as indicated by the Mantoux PPD skin test.

TB Testing (Cont.)

(I) An individual who is skin-test positive with a normal chest X ray should be considered for preventive medication. Those who complete a recommended course of preventive treatment and those for whom preventivetreatment is not medically indicated need have no further testing for tuberculosis unless signs and symptoms which are compatible with tuberculosis disease are present.

(J) All residents of long-term care facilities who are exposed to a case of infectious tuberculosis or who develop signs and symptoms which are compatible with tuberculosis disease shall be medically evaluated. All long term care facility residents shall have a documented annual evaluation to rule out signs and symptoms of tuberculosis disease.

TB Testing (Cont.)

Long-Term Care Employees and Volunteers. All new long-term care facility employees and volunteers who work ten or more hours per week are required to obtain a Mantoux PPD two-step tuberculin test within one month prior to starting employment in the facility. If the initial test is zero to nine millimeters the second test should be given as soon as possible within three weeks after employment begins, unless documentation is provided indicating a Mantoux PPD test in the past and at least one subsequent annual test within the past two years. It is the responsibility of each facility to maintain a documentation of each employee's and volunteer's tuberculin status.

"Yes! That was very loud Mr. Trainer, but I said I wanted to hear your *HEART!*"

'YOU'RE DELIBERATLY PUTTING YOURSELF AT RISK OF ILL HEALTH BY BEING OVER 65...'