CDC 2007 HICPAC Isolation Precautions Guidelines

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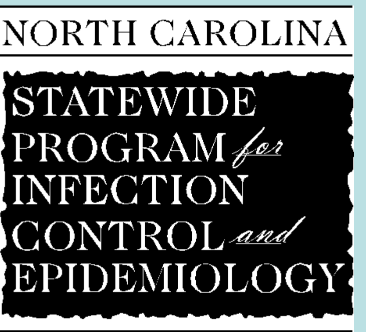


History of Infection Control Precautions in the United States

1877

- Separate Facilities

1910

- Antisepsis and disinfection

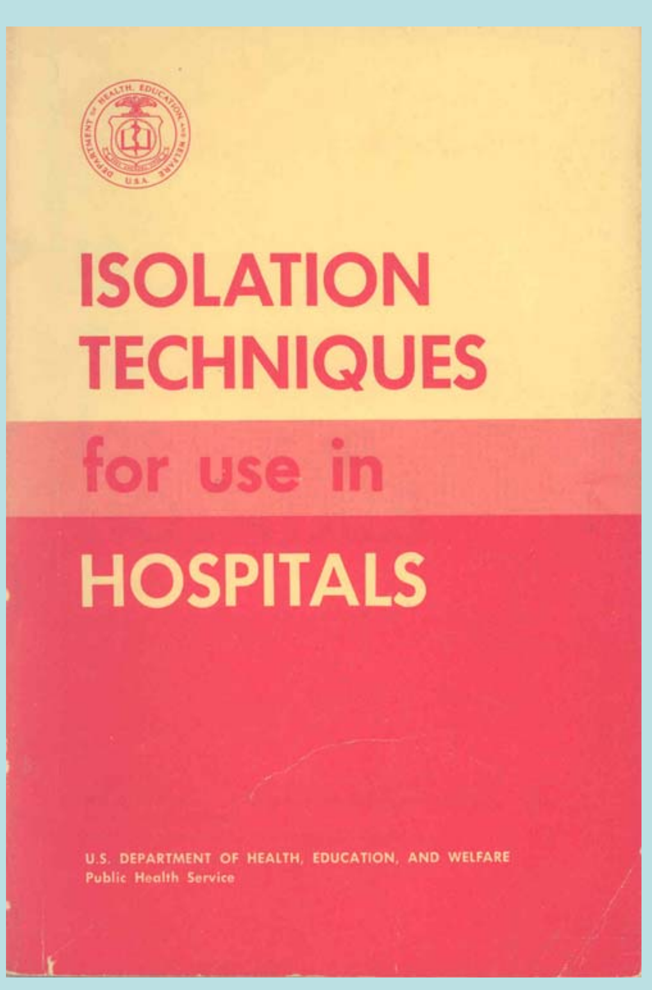
1950-60

- Closure of Infectious disease and TB Hospitals

History of Infection Control Precautions in the United States

1970

- CDC "Isolation Techniques for use in Hospitals", 1st Edition
- Six Categories of Isolation



History of Infection Control Precautions in the United States

- 1975 CDC “Isolation Techniques for Use in Hospitals”, 2ND Edition, color-coded sample category door signs
- 1983 CDC Guideline for Isolation Precautions in Hospitals (Disease-specific and category-based precautions including blood and body-fluids)
- 1985 Universal Precautions
- 1987 Body Substance Isolation (Mostly focused on worker protection)

History of Infection Control Precautions in the United States

- 1996 Publication of CDC/HICPAC revised guidelines

 - Introduced Standard Precautions and kept 3 categories of transmission based precautions

- 2007 Revision CDC HICPAC Guideline for Isolation Precaution

- Broaden to include all healthcare settings

CDC 1975

Strict Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary*; door must be kept closed.
2. Gowns—must be worn by all persons entering room.
3. Masks—must be worn by all persons entering room.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons entering room.
6. Articles—must be discarded, or wrapped before being sent to Central Supply for disinfection or sterilization.

Respiratory Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary*: door must be kept closed.
2. Gowns—not necessary.
3. Masks—must be worn by any person entering room unless that person is not susceptible to the disease.
4. Hands—must be washed on entering and leaving room.
5. Gloves—not necessary.
6. Articles—those contaminated with secretions must be disinfected.

Protective Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary*: door must be kept closed.
2. Gowns—must be worn by all persons entering room.
3. Masks—must be worn by all persons entering room.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons having direct contact with patient.
6. Articles—*see* manual text.

Enteric Precautions

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—*necessary for children only*.
2. Gowns—must be worn by all persons having direct contact with patient.
3. Masks—not necessary.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons having direct contact with patient or with articles contaminated with fecal material.
6. Articles—special precautions necessary for articles contaminated with urine and feces. Articles must be disinfected or discarded.

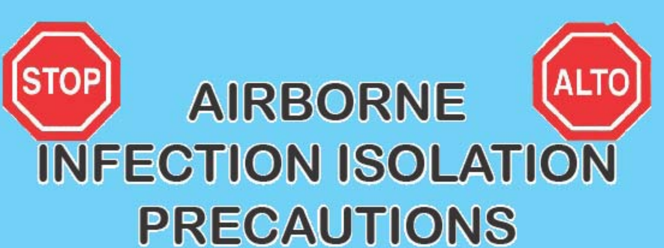
Wound & Skin Precautions

Visitors—Report to Nurses' Station Before Entering Room

1. Private Room—desirable.
2. Gowns—must be worn by all persons having direct contact with infected wound.
3. Masks—not necessary except during dressing changes.
4. Hands—must be washed on entering and leaving room.
5. Gloves—must be worn by all persons having direct contact with infected area.
6. Articles—special precautions necessary for instruments, dressings, and linen.

NOTE: *See* manual for Special Dressing Techniques to be used when changing dressings.

2007 NC Unified Isolation Signage



Visitors must report to Nursing Station before entering.

Perform hand hygiene before entering and before leaving room

Wear N95 respirator when entering room
Visitors see nurse for instruction on proper use.

Keep door closed

Dietary may not enter
No debe entrar el dietista

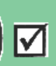
PRECAUCIONES AMBIENTALES

Los visitantes deben presentarse primero al puesto de enfermeria antes de entrar. Lávese las manos. Póngase mascara N95 confiltro al entrar al cuarto. Mantenga la puerta cerrada. No debe entrar el dietista.

Visitors must report to Nursing Station before entering.

Perform hand hygiene before entering and before leaving room

Wear mask when entering room
Visitors and health care workers

 Dietary may not enter
No debe entrar el dietista

PRECAUCIONES DE GOTAS DIMINUTAS

Los visitantes deben presentarse primero al puesto de enfermeria antes de entrar. Lávese las manos. Póngase mascara al entrar al cuarto. No debe entrar el dietista.

HD 5225 Rev. 12/06

2007 NC Unified Isolation Signage

Perform hand hygiene before entering and before leaving room.

Wear gloves when entering room or cubicle, and when touching patient's intact skin, surfaces, or articles in close proximity

Wear gown when entering room or cubicle and whenever anticipating that clothing will touch patient items or potentially contaminated environmental surfaces.

Use patient-dedicated or single-use disposable shared equipment or clean and disinfect shared equipment (BP cuff, thermometers) between patients.

PRECAUCIONES DE CONTACTO

Los visitantes deben presentarse primero al puesto de enfermeria antes de entrar. Lávese las manos. Póngase guantes al entrar al cuarto.

SPECIAL ENTERIC

Perform hand hygiene **before** entering room AND wash hands with **soap and water** before leaving room.
Lávese las manos con agua y jabón.

Wear gloves when entering room or cubicle, and whenever touching the patient's intact skin, surfaces, or articles in close proximity.

Wear gown when entering room or cubicle and whenever anticipating that clothing will touch patient items or potentially contaminated environmental surfaces.

Use patient-dedicated or single-use disposable shared equipment or clean and disinfect shared equipment (BP cuff, thermometers) between patients.

PRECAUCIONES DE CONTACTO

Los visitantes deben presentarse primero al puesto de enfermeria antes de entrar. Lávese las manos. Póngase guantes al entrar al cuarto.

2007 NC Unified Isolation Signage

ATTENTION/ATTENCIÓN

PROTECTIVE PRECAUTIONS

Visitors must report to Nursing Station before entering.

Perform hand hygiene before entering and before leaving room

No persons with infections may enter

No dried or live plants or flowers

No non-peelable fresh fruits or vegetables

Wear Mask

Wear Gloves

Wear Gown

PRECAUCIONES DE PROTECCIÓN

Los visitantes deben presentarse primero al puesto de enfermeria antes de entrar. Lávese las manos. No entren personas con infección. No entren con plantas vivas ni alimentos.

SPECIAL AIRBORNE/CONTACT PRECAUTIONS

Visitors, including family, must not enter—report to Nursing Station.

HEALTH CARE WORKERS MUST WEAR

- N95 Respirator (prior fit test required)
- Gloves
- Gown
- Protective eyewear
  (you must wear **goggles** for aerosol–generating procedures)

Reminder: HAND HYGIENE must be performed before entering the room and following removal of PPE and leaving the patient's room.

For questions call the Infection Control Professional.

PRECAUCIONES ESPECIALES CONTACTO AÉREO

Visitantes tienen que reportarse en la estación de enfermeras antes de entrar a este cuarto.

Antes De Entrar A Esta Habitación Tiene Que Usar Los Siguientes Artículos De Protección Personal:

- Respirador N95 (es necesaria prueba de ajuste)
- Guantes
- Bata
- Protección para los ojos
  (Tiene que ponerse anteojos protectors para procedimientos con aerosol)

Recordatorio: Tiene que lavarse las mano antes de entrar a este cuarto, al quitarse los artículos de protección personal y al salir del cuarto.

Si tiene preguntas llame al Profesional en Control de Infecciones

Since 1996:

- Increased recognition of organizational factors affecting success of infection control
  - Administrative policies
  - Staffing
  - Education
  - Antimicrobial utilization
- Increased number and prevalence of antimicrobial resistant pathogens
- New Pathogens (SARS, AVIAN INFLUENZA)
- Respiratory Hygiene, Cough Etiquette
- Bioterrorism (Anthrax)

CDC HICPAC

Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007

Jane Siegel, Marguerite Jackson, Emily Rhinehart, Linda Chiarello, and the Healthcare Infection Control Practices Advisory Committee (HICPAC)

(220 page document)

Standard Precautions

- Still the foundation of infection prevention for patients and healthcare personnel

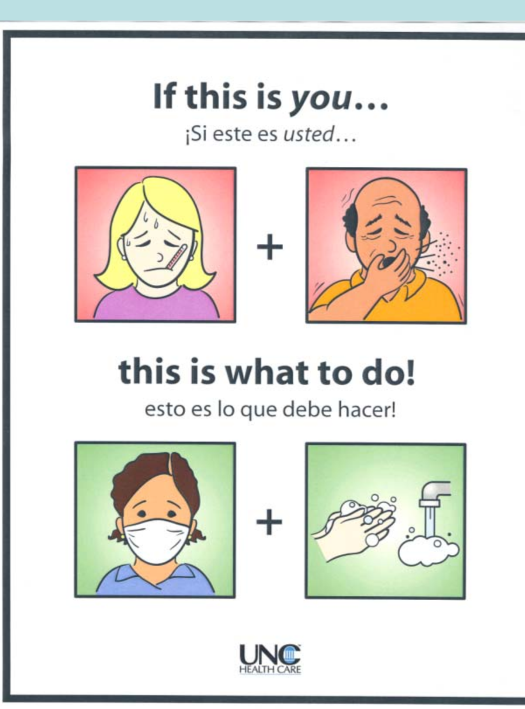
- Constant use of gloves and handwashing (plus face-shields, masks or gowns if splashes are anticipated) for ANY contact with blood, moist body substances (except sweat), mucous membranes or non-intact skin.

  - Gloves are removed and discarded immediately after completion of a task.
  - Hands are washed every time gloves are removed.

Standard Precautions

New components:

- Respiratory hygiene and cough etiquette
  - Education–chart for PPE donning and doffing
  - Patient behaviors
  - Administrative policies and practices making organizational priority
  - Mask use during special lumbar puncture procedures
  - Added attention to safe injection practices



Transmission-based Precautions

Used in addition to Standard Precautions

- **Airborne**
- Droplet
- Contact

▸ *Laboratory and procedure-specific safety*

Airborne Infection Isolation (AII)

For infections spread by particles that remain suspended in the air

(TB, measles, varicella, and variola)

- Airborne Infection Isolation Room (AIIR)
  (a.k.a. "negative pressure room")
- Surgical mask on patient during transport
- Respiratory protection for personnel in AIIR
- AIIR exhaust should not be re-circulated in the building (6-12 air exchanges/hr)
- Exhaust air away from people, e.g., off the roof

Survival in transit:

- Organism factors
- Environmental factors
  - Time / Distance
- Droplet size?

“5 microns”

- Diameter related to unique pathogenesis of pulmonary *Mycobacterium tuberculosis* infection
  - Terminal alveolar deposition
  - “Obligate” inhalational transmission
- Much larger particles can float and are inhaled.
- Most inhaled particles are not infectious.
- Most respiratory pathogens do not require terminal alveolar deposition, but infect the upper respiratory mucosa.
- “Opportunistic” inhalational transmission?

Droplet Precautions

For infections spread by large droplets generated by coughs, sneezes, etc.

(MDRO pneumonia, myoplasma, influenza)

- Face shield or goggles, and a surgical mask are worn to prevent droplets reaching the mucous membranes of the eyes, nose and mouth when within 3-10 feet of the patient
- Patients should be separated by 3-10 feet, or be grouped with other patients with the same infection/colonization status
- Patient should wear a surgical mask when outside of the patient room
- AIIR is not needed

Contact transmission

- Direct
  - Skin to skin hands

- Indirect
  - Fomites
  - Environmental surfaces

Contact Precautions

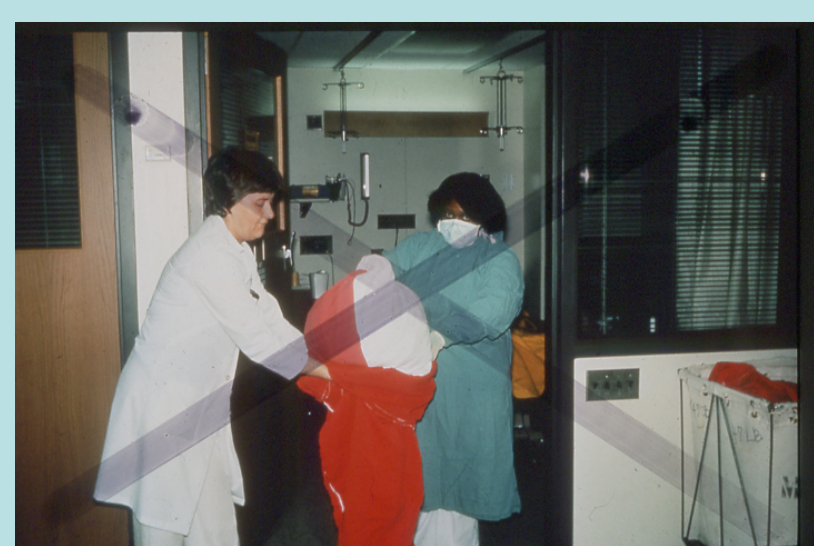
For infections spread by direct or indirect contact with patients or patient-care environment

(scabies, C. difficile, MDROs/MRSA, infected wounds, lice)

- Limit patient movement- transporters not in PPE out of room
- Private room preferred
- Cohort patients with the same infection status
- **Don gown and gloves before entering the patient room**
- **Remove and discard gown and gloves inside the patient room**
- Hand hygiene immediately after leaving the patient room
- Emphasis on cleaning, esp. frequently touched surfaces (bed rails, bedside tables, lavatory surfaces, etc.)
- Dedicated equipment whenever possible (e.g., stethoscopes)

CDC Isolation Precautions Guidelines

- Do **Not** require or recommend for patients/residents on any precaution category
  - Special bag or process for linen
  - Double bagging trash or linen
  - Red bag collection of waste
  - Double gloving
  - Disposable dishes



Management of Multidrug-Resistant Organisms In Healthcare Settings, 2006

Jane D. Siegel, MD; Emily Rhinehart, RN MPH CIC; Marguerite Jackson, PhD; Linda Chiarello, RN MS; the Healthcare Infection Control Practices Advisory Committee

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Part II: CDC Isolation Precautions Guidelines
Multi-drug Resistant Organisms (MDRO's)

- MRSA, VISA, VRSA, and VRE
- Community-associated MRSA
- Extended Spectrum Beta-Lactum (ESBL) GNR
- Gram-negative pathogens
    - *Acinetobacter*
    - *Klebsiella*, et al
    - *C. difficile*

Vancomycin Resistant Enterococci (VRE)

- *Enterococcus faecalis, faecium*
- Normal GI flora-enterococcus
- Try not to cohort MRSA culture positive with VRE culture positive residents
- Colonization lasts for months to years in GI tract

Clostridium difficile

- Antibiotic induced diarrhea ↑ toxin production
- **Out of precautions 24 hours after first formed stool**
- Do not do repeat cultures or toxin screens post treatment
- Treatment: Metronidazole (Flagyl), if ineffective
  Vancomycin for about 10 days
- New more toxic strain circulating (megacolon)

Clostridium difficile

- Do not use alcohol handrubs for hand hygiene
  - Use soap and water when exiting room
- Spore former (24 hours) after environmental exposure
- Handwashing physically washes away spores
- Fecal oral transmission

cdc.gov/ncidod/dhqp/id_(dit(FAQ_HCP.html

Acinetobacter baumannii

- Aerobic gram negative bacillus
- Military strain-resistant to all antibiotics
- Outbreaks in acute care ICUs
- Contact Precautions
- Hardy environmental survivor – especially moist surfaces (i.e., bronch carts)

Klebsiella pneumoniae Carbapenemase (KPC)

(K. oxytoca, Citrobacter freundii, E coli, Serratia spp)

- Enterobacteriaceae group - GNR
- First cases identified in US in eastern NC
- Accounted for 15% of all HAIs reported to CDC's NHSN in 2007
- Class A B-lactamase confers resistance to all extended spectrum cephalosporins and carbapenems

Guidance for Control of Infections with Carbapenem-Resistant or Carbapenemase-Producing *Enterobacteriaceae* in Acute Care Facilities

MMWR. March 20, 2009 / 58(10);256-260

cdc.gov/mmwr/preview/mmwrhtml/mm5810a4.htm

Adherence

- Administrative involvement
  - Staffing support
  - Resource allocation
- Systematic implementation
- Observation and enforcement
- Culture change

Compliance is the issue!

MDRO Prevention:
Baseline Activities for ALL Healthcare Settings

Administrative measures

- Designate MDRO prevention an institutional priority
- Implement notification systems for reportable MDROs
- Designate hand hygiene adherence an institutional priority with monitoring and feedback

MDRO Prevention:
Baseline Activities for ALL Healthcare Settings

MDRO education

- Provide MDRO education during orientation and education updates

- Include MDRO education in pre-post-medical education

MDRO Prevention:
Baseline Activities for ALL Healthcare Settings

Antibiotic stewardship

- Verify prescribed antibiotics are active against clinical isolates
    - Vancomycin is first choice
    - Linezolid (Zyvax) oral alternative since 2000
- Form multi-disciplinary committee to:
    - Review antibiotic utilization patterns
    - Compare susceptibility trends
    - Provide appropriate antimicrobial formulary

MDRO Prevention:
Baseline Activities for ALL Healthcare Settings

Surveillance

- Establish lab-based systems to detect and communicate evidence of MDROs
- Prepare/review susceptibility reports
- Target specific MDROs for systematic monitoring
- Monitor trends for targeted MDROs

MDRO Prevention:
Baseline Activities for ALL Healthcare Settings

Precautions

- Observe Standard Precautions for all patients
- Prioritize known MDRO patients for single rooms
- Contact Precautions applied on case-by-case basis

MDRO Prevention:
Baseline Activities for ALL Healthcare Settings

Environmental measures

- Routine cleaning and disinfection

Discontinuation of MDRO Contact Precautions

- Follow guidelines on case-by-case basis

Intensified MDRO Control Measures

- Initiate if:
  - MDRO rates are increasing, or
  - MDRO rates are not decreasing

Intensified MDRO Control Measures

Administrative measures

- Consult with experts on assessment, design and implementation of MDRO measures
- Assess system for factors that contribute to problem
- Implement systems to identify MDRO patients

Intensified MDRO Control Measures

Administrative measures

- Implement intensive monitoring of selected indicators
- Feedback to clinicians

Education

- Facility-wide campaigns
- Include- MDRO trends, process measures, outcomes…i.e. dashboards reinforcement

Quality assessment and performance improvement

Intensified MDRO Control Measures

Antimicrobial stewardship

- Restrict selected antimicrobials that are contributing to increased MDRO prevalence

Intensified MDRO Control Measures

Surveillance

- Calculate/analyze target MDRO prevalence
- Perform active surveillance cultures on populations identified as at-risk
- Establish protocols to save isolates for typing with outbreaks
- Many hospitals screening admissions in high risks groups
- LTCFs not recommended to use ASC routinely

Intensified MDRO Control Measures

Environmental measures

- Patient-dedicated equipment
- Prioritize MDRO room-cleaning
  - Dedicated personnel
  - Enhanced cleaning and disinfection
  - Target “high touch” areas
- Environmental cultures if indicated epidemiologically
- Vacate and clean units as last resort

Intensified MDRO Control Measures

Decolonization (e.g., MRSA in nares)

- Guided by expert consultation
- Do not routinely culture staff for colonization with MRSA
- Decolonize HCWs only if epidemiologically implicated
- Mupirocin has been shown to be somewhat effective

Intensified MDRO Control Measures

In acute care settings

- Implement Contact Precautions
- Patient placement – single rooms when available

In LTCFs, ambulatory and home care

- Use Hand Hygiene and gloves routinely
- Implement contact precautions on case-by-case basis

Hygiene for Residents on Isolation Precautions

- Staff instruct residents on appropriate hand hygiene (and assist when needed)
- Residents perform hand hygiene upon leaving room and returning from group activities
- Gloves will NOT be worn by residents
- Residents will put on clean clothing before leaving room.

NC Guidelines for Control of Antibiotic Resistant Organisms, Specifically LTCFs

MRSA

- Admission to licensed facilities should not be denied or restricted because of colonization or infection with MRSA.
- Standard Precautions are adequate
  - Nasal or superficial colonization (e.g., identified from sputum culture, but without purulence) with MRSA

NC Guidelines for Control of Antibiotic Resistant Organisms: MRSA

- Contact Precautions are indicated for:
  - Urinary catheter associated-MRSA
  - Wounds heavily colonized or infected with MRSA
  - Tracheostomy patients colonized or infected unable to handle secretions.

NC Guidelines for Control of Antibiotic Resistant Organisms in LTCFs: VRE

VRE

- Admission to licensed facilities should not be denied or restricted because of colonization or infection with VRE
- Standard Precautions are adequate for patients
  - Colonized with VRE in GI tract and continent of stool
  - And capable of maintaining hygienic practices (e.g., handwashing)

North Carolina Guidelines in LTCF:VRE (cont)

VRE

- Contact Precautions are indicated for patients
  - With wound heavily colonized or infected with VRE
  - With foley catheter associated VRE, (either UTI or colonization)
  - When a cluster of nosocomial (institutionally acquired) infections is recognized then contact precautions should be instituted for all identified cases.

North Carolina Guidelines in LTCFs

MRSA/VRE

- Room placement for patients on contact precautions
  - Ideally, in a private room
  - When a private room is unavailable, cohort with same microorganism and no other identified infection

North Carolina Guidelines in LTCFs

MRSA/VRE

- Room placement for patients on contact precautions (cont)
  - If private and cohort unavailable, select roommate that
    - Has intact skin
    - Has no invasive devices
    - Not significantly immunocompromised

Major Question for all MDRO's

Policies and Procedures

How does a patient get designated as no longer colonized, i.e., "cleared" of having an MDRO?

Answer: No recommendation from CDC, APIC, SHEA

NC Guidelines for Control of Antibiotic Resistant Organisms: MRSA/VRE

- Termination of precautions - adopt a policy e.g. culture 48-72 hours after ATB are discontinued, and after ~~2 cultures taken one week apart~~ are negative.
- 2008 – UNC policy change to culture weekly X 3 and are negative

Control of MRSA/VRE Outbreaks in LTCFs

- Epidemiologic assessment initiated
  - Identify risk factors for cross-transmission (e.g., handwashing compliance, common equipment contamination)
  - Clinical isolates saved and submitted for strain typing
- Colonized or infected patients identified as quickly as possible

Summary - Prevention and Control of Resistant Organisms: MRSA, MRSE and VRE

- Compliance with infection control practices
- Judicious use of antimicrobials

Thank you!