

**Hopital Sacre Coer**

**Infectious Diseases Symposium  
2011**

**Infection Control and Antimicrobial  
Stewardship**

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Center



# Outline

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- Hand hygiene
- Infection Control
- Antimicrobial Stewardship

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**Hand Hygiene Is The Single  
Most Important Way to  
Protect Our Patients From  
Infection!**

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# INFECTION CONTROL

# ~~What is an infection control programme?~~

Important components of the infection control programme:

- basic measures for infection control, i.e. standard and additional precautions
- education and training of health care workers
- protection of health care workers, e.g. immunization
- identification of hazards and minimizing risks
- routine practices essential to infection control such as aseptic techniques
- use of single use devices, reprocessing of instruments and equipment
- antibiotic usage, management of blood/body fluid exposure, handling and use of blood and blood products, sound management of medical waste

# More about infection control programmes?

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- Effective work practices and procedures, such as environmental management practices including management of hospital/clinical waste, support services (e.g., linen), use of therapeutic devices
- surveillance
- incident monitoring
- outbreak investigation
- infection control in specific situations; and
- research

# Infection control practices can be grouped in two categories

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Transmission of infections in health care facilities can be prevented and controlled through the application of basic infection control precautions which can be grouped into

1. **Standard precautions** – must be applied to ALL patients at ALL times (regardless of diagnosis or infectious status), and
2. **Additional (transmission-based) precautions** - specific to modes of transmission
  - Airborne
  - Droplet
  - Contact

# Standard Precautions

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**Wear appropriate Personal Protective Equipment (PPE) as indicated by potential for contact/soiling with body fluids, and/or mucous membranes and non-intact skin e.g.**

- 1. Gloves – oral hygiene, wound care, etc.**
- 2. Faceshield – suctioning and other aerosol/droplet generating procedures**
- 3. Gown- Endoscopy and other procedures where sprays or splashing is possible**

**ALWAYS perform Hand Hygiene upon removing PPE and before leaving immediate work site**

# Hand Hygiene

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- Handwashing with soap and water if hands are soiled (minimum 15-30 seconds of scrubbing)
- Alcohol Rub (5-10 seconds)
- Policy on nail length/artificial nails

# AIRBORNE PRECAUTIONS

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- **VISITORS:** REPORT TO NURSES' STATION BEFORE ENTERING ROOM
- **VISITANTES:** FAVOR DE ANUNCIARSE A LA ENFERMERA DE PISO ANTES DE ENTRAR AL CUARTO

探訪者請注意：在您進入任何病房之前，請先去護士站報到。



**N95 particulate respirator to enter room**

**Keep door closed**

**GOOD HAND HYGIENE IS ESSENTIAL**

# Airborne Precautions (back of sign)

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- Tuberculosis (TB)
- Measles

**NPIR (Negative Pressure Isolation Room) required.  
Exceptions must be approved by Hospital  
Epidemiology/Infection Control.**

**(Patient must wear surgical mask when exiting  
room)**

# DROPLET PRECAUTIONS

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- **VISITORS:** REPORT TO NURSES' STATION BEFORE ENTERING ROOM
- **VISITANTES:** FAVOR DE ANUNCIARSE A LA ENFERMERA DE PISO ANTES DE ENTRAR AL CUARTO

探訪者請注意：在您進入任何病房之前，請先去護士站報到。



**Surgical masks to enter room.  
Keep contaminated hands away from eyes or face.**

**GOOD HAND HYGIENE IS ESSENTIAL**

# Droplet Precautions (back of sign)

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- Pertussis
- Influenza (adults)
- Bacterial meningitis
- Parvovirus (B19)
- Mumps

NOTE TO STAFF: Keep hands away from eyes and face

# CONTACT PRECAUTIONS

- **VISITORS:** REPORT TO NURSES' STATION BEFORE ENTERING ROOM
- **VISITANTES:** FAVOR DE ANUNCIARSE A LA ENFERMERA DE PISO ANTES DE ENTRAR AL CUARTO

探訪者請注意：在您的進入任何病房之前，請先去護士站報到。



Gloves to enter room



**GOWNS** to enter room if clothing will have contact with patient or environment

**GOOD HAND HYGIENE IS ESSENTIAL**

# Contact Precautions (back of sign)

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- **MRSA**
- **VRE**
- **Multiple Drug Resistant Organisms as defined by Hospital Epidemiology**

## MODIFIED CONTACT PRECAUTIONS

- **VISITORS:** REPORT TO NURSES' STATION BEFORE ENTERING ROOM
- **VISITANTES:** FAVOR DE ANUNCIARSE A LA ENFERMERA DE PISO ANTES DE ENTRAR AL CUARTO

探訪者請注意：在您進入任何病房之前，請先去護士站報到。



**GLOVES** to enter room



**GOWNS** to enter room

**GOOD HAND HYGIENE IS ESSENTIAL**

## **MODIFIED CONTACT PRECAUTIONS (back of sign)**

- ***C. difficile* enteritis**

**Dilute bleach solution required for cleaning the environment.**



# Elements of Postexposure Management

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- **Wound management (Immediately)**
- **Exposure reporting (Within 2 hours)**
- **Assessment of infection risk**
  - **type and severity of exposure**
  - **bloodborne infection status of source person**
- **Appropriate treatment, follow-up, and counseling**

# Postexposure Management: Wound Care

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- **Clean wounds with soap and water**
- **Flush mucous membranes with water**
- **No evidence of benefit for:**
  - **application of antiseptics or disinfectants**
  - **squeezing (“milking”) puncture sites**
- **Avoid use of bleach and other agents caustic to skin**

# Reporting an Exposure

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- **Report to Emergency Dept or via protocol**
- **Rapid HIV testing available to guide management**

## **Postexposure Management: Based on specific circumstances of exposure**

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- **Date and time of exposure**
- **Procedure details...what, where, how, with what device**
- **Exposure details...route, body substance involved, volume/duration of contact**
- **Information about source**

# Bloodborne Pathogens

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- **Hepatitis B, Hepatitis C, and HIV**
- **Relative risk of infection (30%, 3%, and <1% respectively)**
- **Potential routes of workplace transmission (sharp injury, mucous membrane exposure/ non-intact skin)**

# Hepatitis B Vaccine

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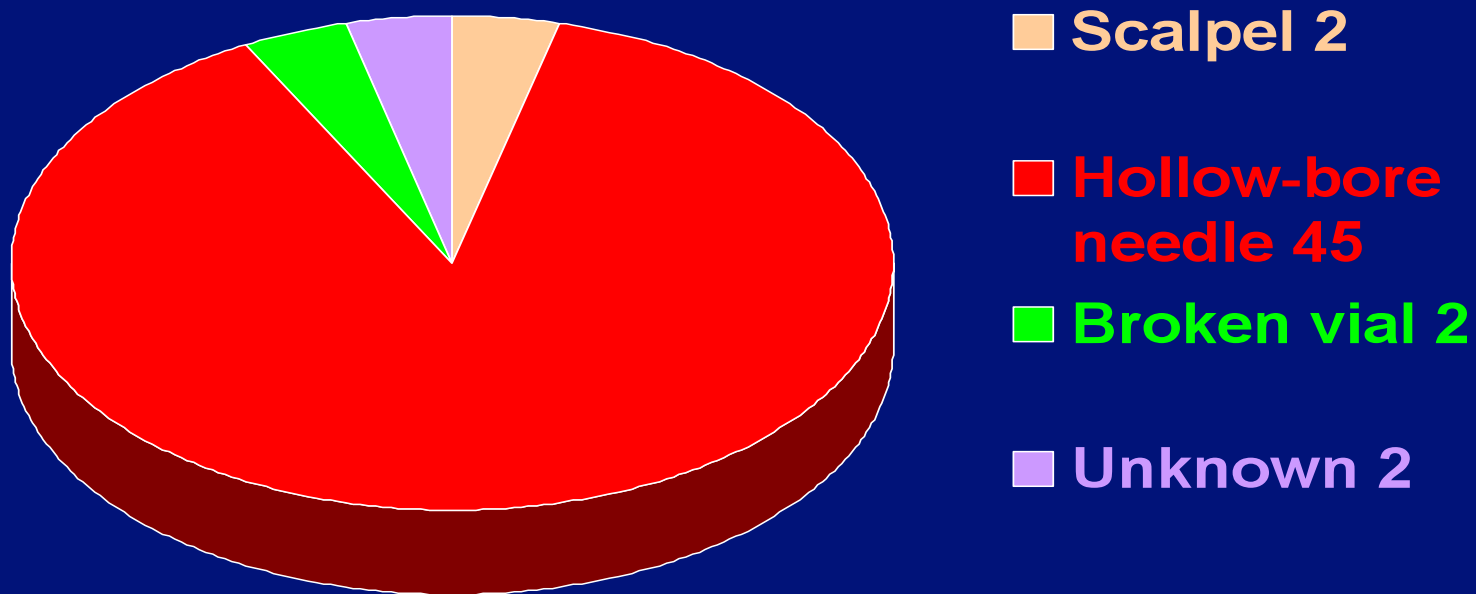
- **Available for employees with potential body fluid exposure**
- **Safe and effective**
- **Positive impact on Hepatitis B infection rates (Healthcare Workers)**



# Sharp Objects Associated with 51 Percutaneous Injuries Resulting in HIV

## Seroconversion in 50 Healthcare Personnel\*

June 2001



\* <http://www.cdc.gov/hiv/pubs/facts.htm#Transmission>

# Risk of Bloodborne Virus Transmission after Occupational Percutaneous Exposure

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<u>Source</u>	<u>Risk</u>
HBV	
HBeAg +	22.0-30.0%
HBeAg -	1.0-6.0%
HCV	1.8%
HIV	0.3%

## Risk Factors for HIV Transmission After Percutaneous Exposure to HIV-Infected Blood: CDC Case-Control Study\*

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<u>Risk Factor</u>	<u>Adjusted OR ratio (95% CI)</u>
Deep injury	15 (6.0-41)
Visible blood on device	6.2 (2.2-21)
Procedure involving needle placed in artery or vein	4.3 (1.7-12)
Terminal illness in source patient	5.6 (2.0-16)
Postexposure use of zidovudine	0.19 (0.06-0.52)

\*Cardo et al., New Engl J Med 1997;337:1485-90

## Initiation of HIV PEP

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- If indicated, start antiviral drugs as soon as possible after exposure
  - regard as an urgent medical concern
  - hours rather than days
- Interval after which PEP is no longer likely to be effective in humans is unknown
  - initiating PEP days or weeks after an exposure might be considered if warranted for increased risk exposure

# HIV PEP

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**Will be discussed Thursday!**

# Preventing Transmission of Bloodborne Viruses in Healthcare Settings

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- **Receive hepatitis B vaccination if available**
- **Treat all patients as potentially infectious (STANDARD PRECAUTIONS)**
- **Use barriers to prevent blood/body fluid contact (STANDARD PRECAUTIONS)**
- **Prevent percutaneous injuries (USE SAFETY DEVICES and handle sharps appropriately)**

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**PREVENTION  
IS PRIMARY!**

# TUBERCULOSIS

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## **Latent pulmonary TB infection**

- PPD positive skin test
- Not treated for PPD skin test (or unknown status)
- Symptoms absent
- No isolation needed

## **Suspected or Active Pulmonary TB**

- Symptoms present (includes cough > 2 weeks duration, +/- weight loss, night sweats, hemoptysis)
- Requires airborne isolation

# Tuberculosis Control Program

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- **PPD skin testing upon employment and annually (six-months for high risk job titles)**
- **Post-exposure skin testing as notified by manager and/or infection control (baseline and 12 weeks later)**

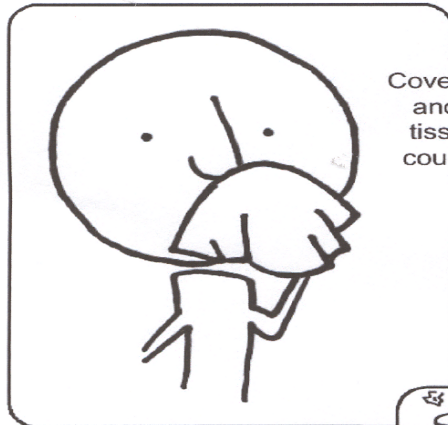
## **Hierarchy of Controls (TB)**

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- **Administrative controls – protocols in place for front line staff to identify possible infectious TB and initiate Airborne Isolation**
- **Engineering Controls – Negative Pressure Isolation Room**
- **Work Practice Controls – Doors kept closed, windows open**
- **PPE – Particulate respirator (N95) Fit testing, other masks**

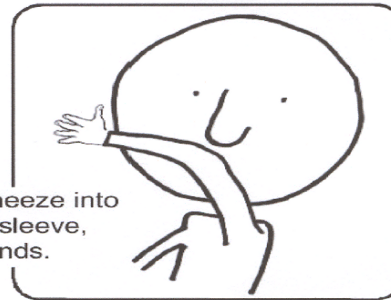
Stop the spread of germs that make you and others sick!

# Cover your Cough

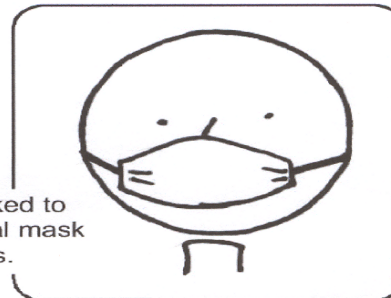


Cover your mouth and nose with a tissue when you cough or sneeze

or cough or sneeze into your upper sleeve, not your hands.



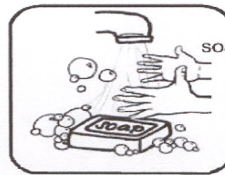
Put your used tissue in the waste basket.



You may be asked to put on a surgical mask to protect others.

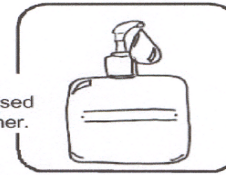
## Clean your Hands

after coughing or sneezing.



Wash with soap and water

or clean with alcohol-based hand cleaner.



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**INFECTION CONTROL IS  
EVERYBODY'S RESPONSIBILITY!**

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# Antimicrobial Stewardship

## Case

### Mr C.

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- Mr C is a 35 year old healthy man who comes to clinic complaining of runny nose, frontal sinus congestion, sore throat, and myalgias for 7 days.
- His vital signs are stable and he is afebrile. His exam is notable for mild tonsillar erythema and some generalized sinus tenderness
- He states that he is really busy working and has 2 young children at home (who both have colds). His symptoms have been going on for a week and he wants a prescription so he get better fast

## Mr C.

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The most likely diagnosis and appropriate course of action is:

- A. Acute bacterial sinusitis because of his generalized frontal headache. Recommend Amox-clav 875mg bid for 10 days
- B. Acute bronchitis because of his cough – Recommend Moxifloxacin 400mg PO daily for 14 days
- C. Acute pharyngitis because he has a sore throat – Recommend a azithromycin for 5 days
- D. He most likely has a viral infection – Recommend no antibiotics, decongestants if need, plenty of rest and fluids...and of course a flu shot

## Mr C.

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The most likely diagnosis and appropriate course of action is:

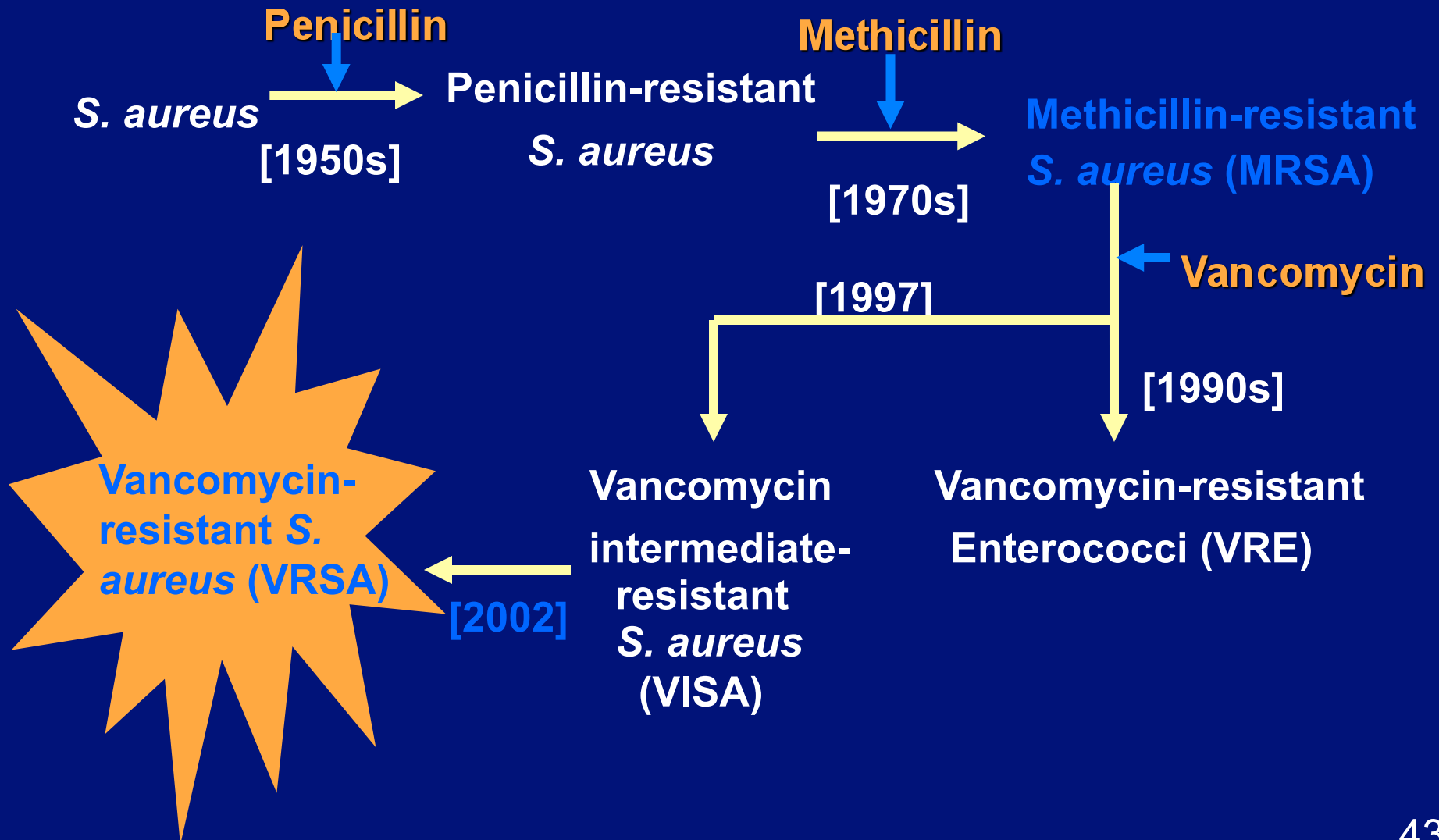
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- D. He most likely has a viral infection – Recommend no antibiotics, decongestants if need, plenty of rest and fluids...and of course a flu shot

# The Discovery of Antibiotics

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# Evolution of Drug Resistance in *Staphylococcus aureus*



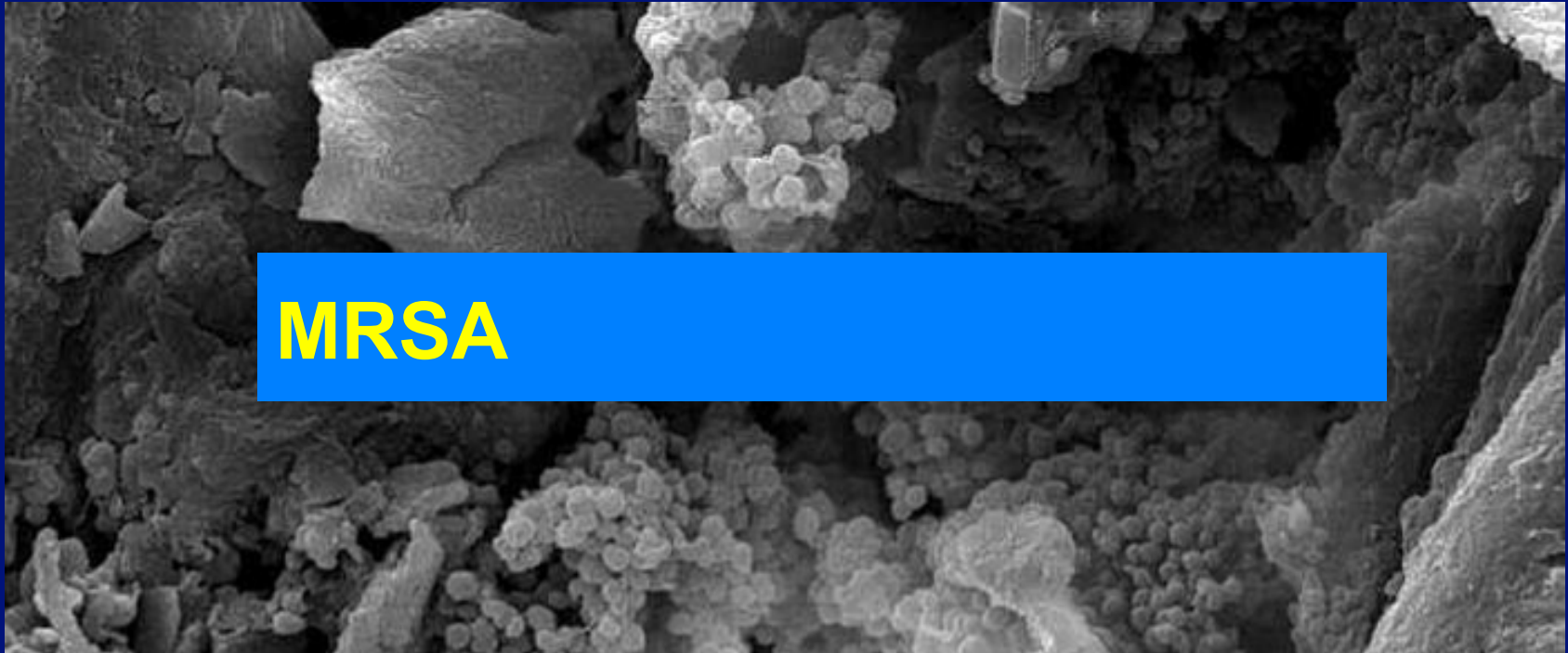
# Antibiotic Resistant Organisms in Nosocomial Infections

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MRSA = Methicillin-Resistant *Staphylococcus aureus*

VRE = Vancomycin-Resistant Enterococci

ESBL = Extended Spectrum Beta-lactamase producing (*E. coli* or *Klebsiella pneumoniae*)

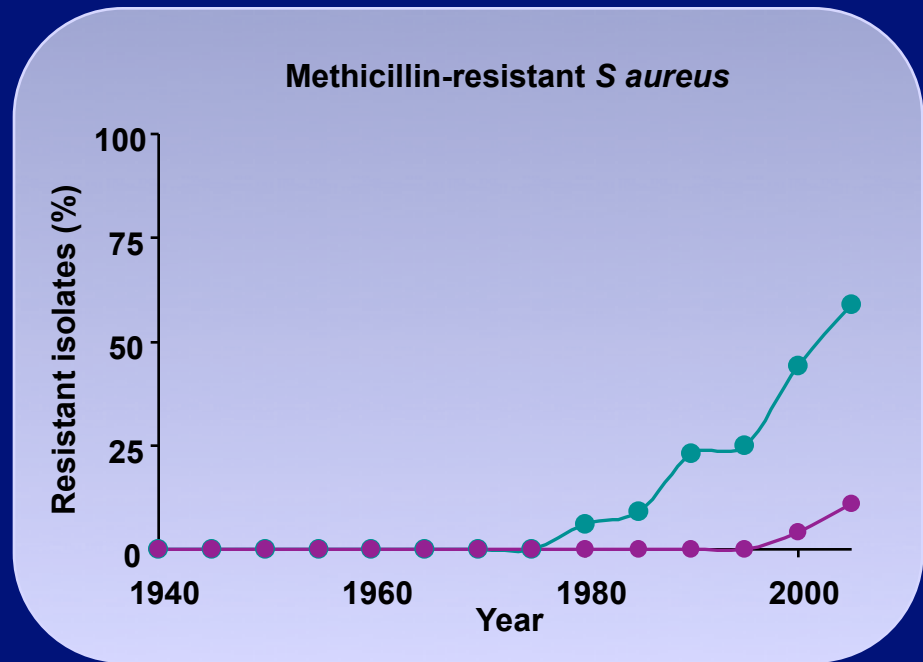
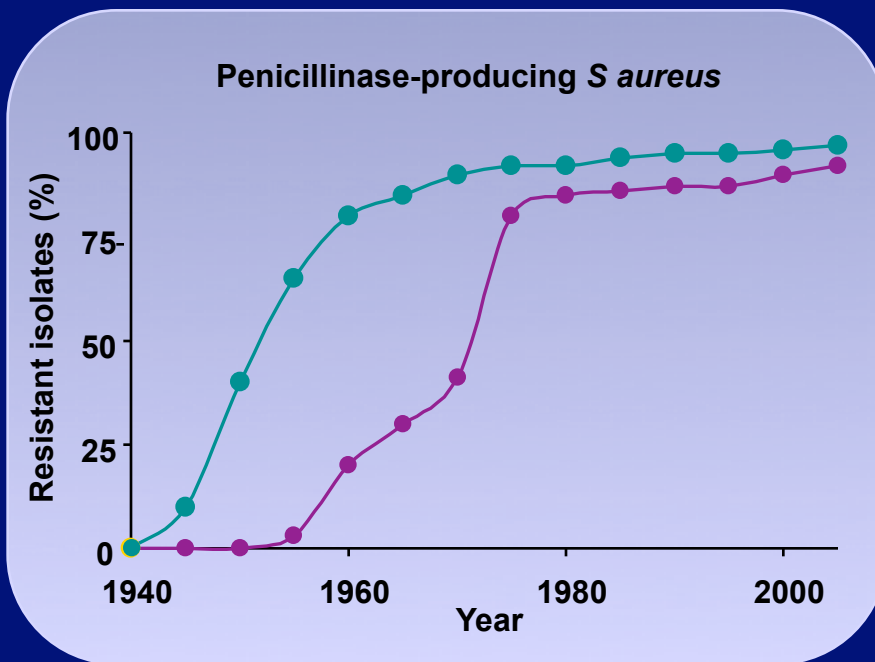


**MRSA**

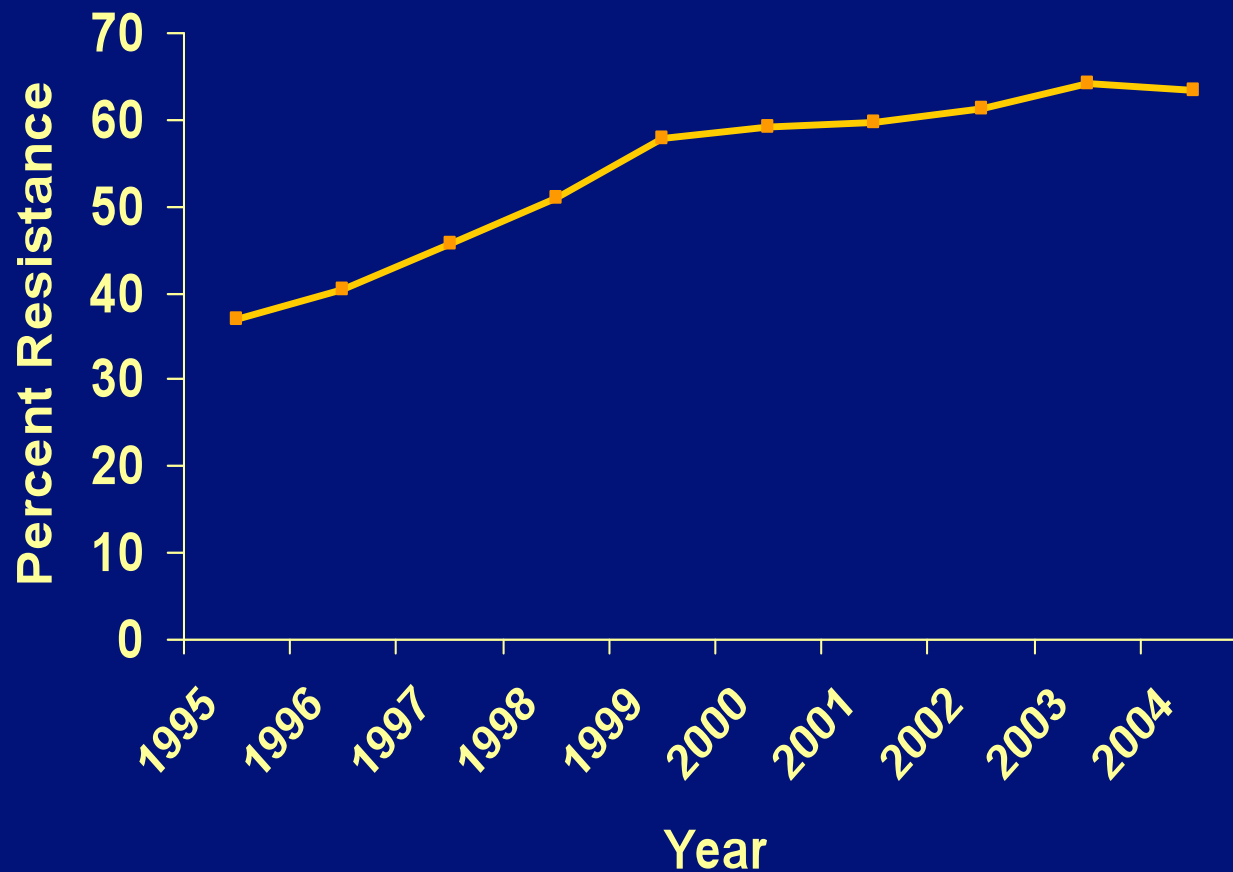
# Progression of resistant *Staphylococcus aureus*

A similar trend in the increase in nosocomial infections caused by antimicrobial-resistant *S aureus* isolates can be observed in community-acquired infections

● Nosocomial infection    ● Community-acquired infection



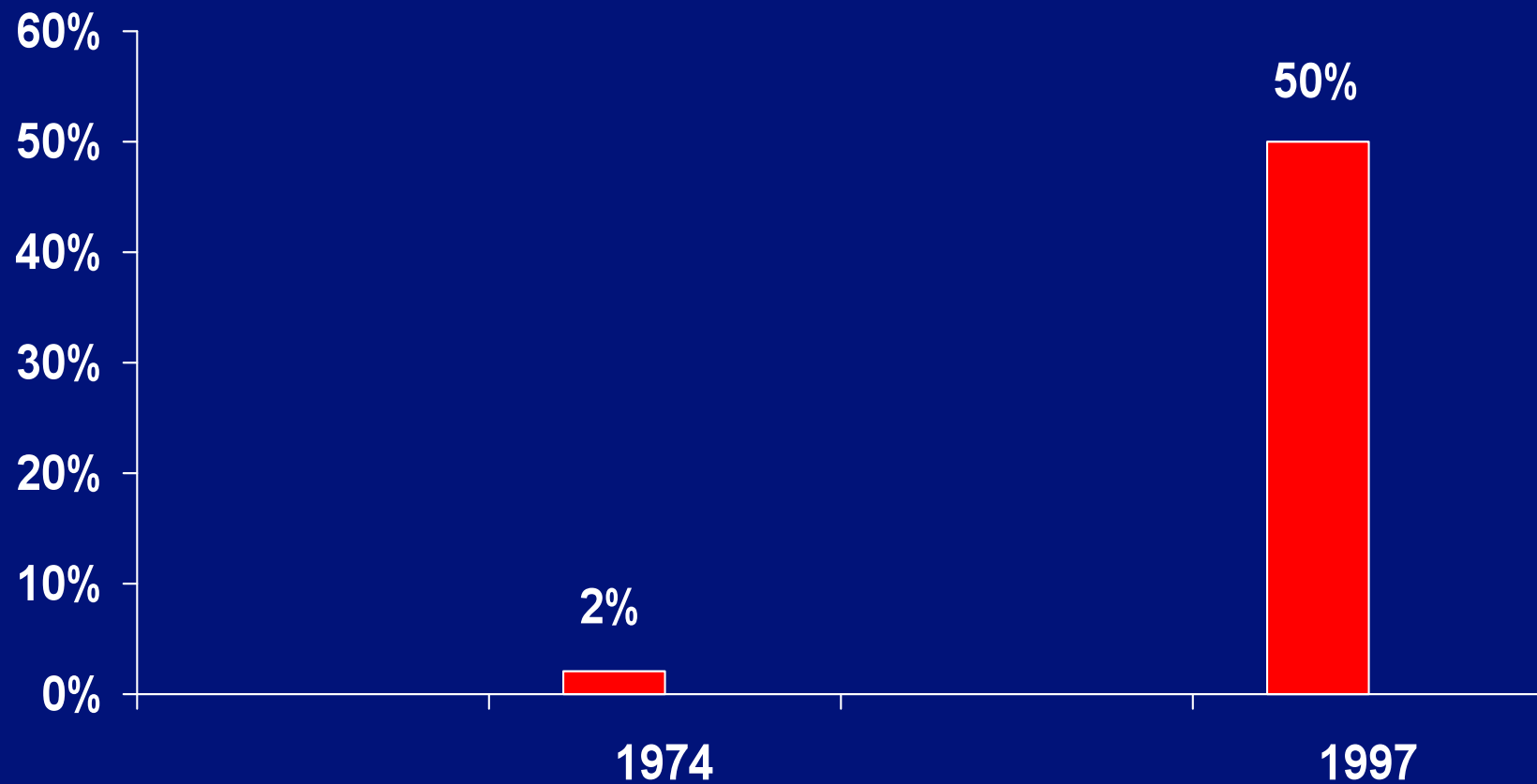
# Methicillin-Resistant *Staphylococcus aureus* (MRSA) Among Intensive Care Unit Patients, 1995-2004



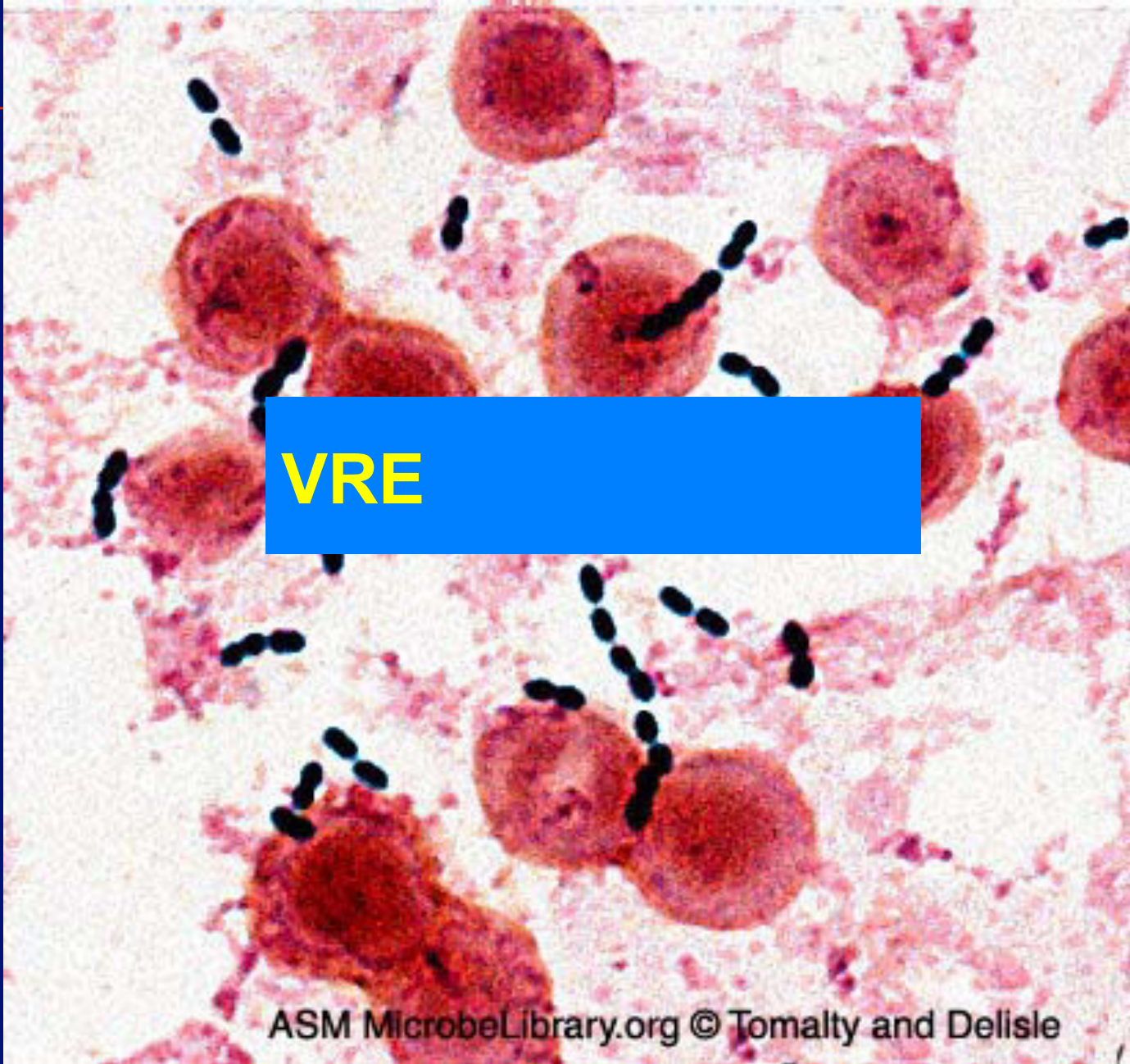
Source: National Nosocomial Infections Surveillance (NNIS) System

# Incidence of Nosocomial Pneumonia Caused by *S. aureus*

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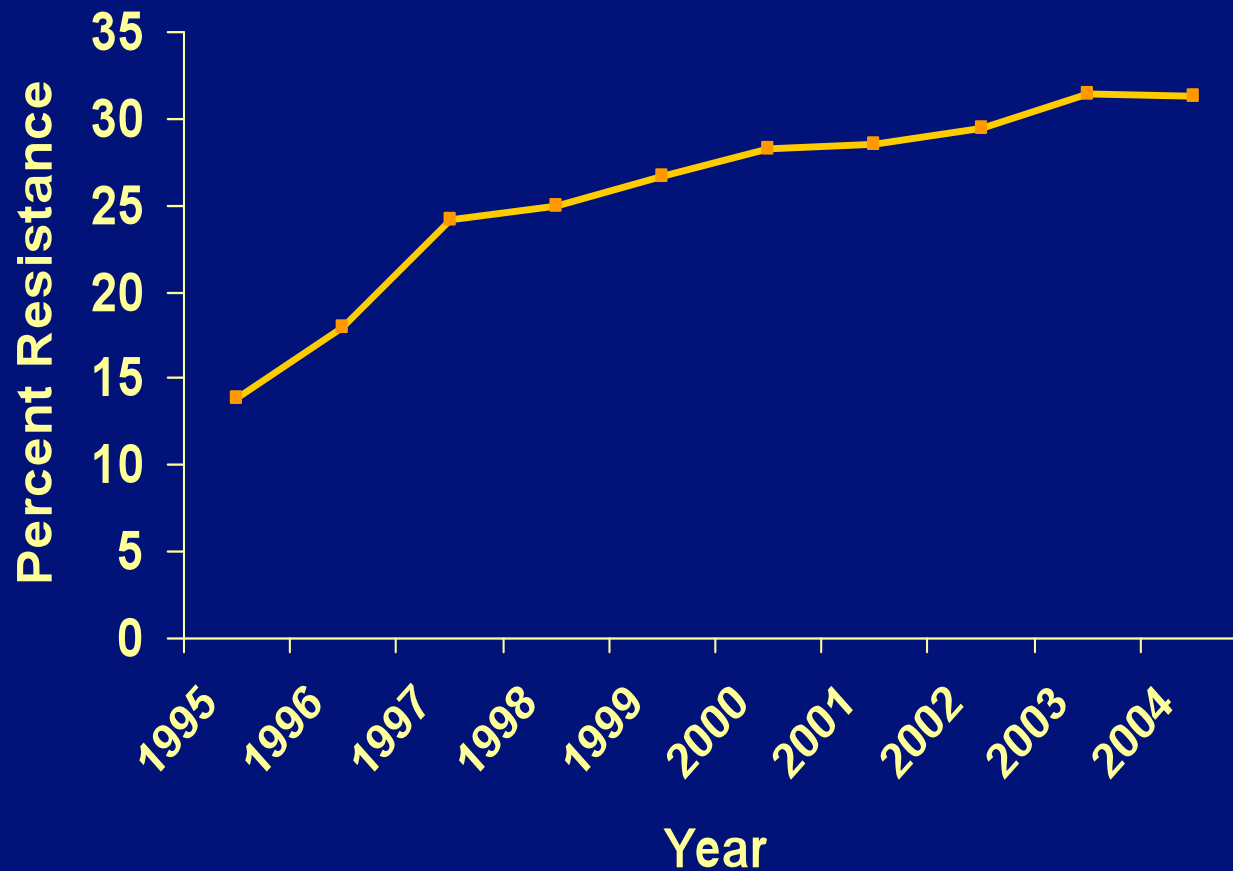
Pujol et al. *Eur J Clin Microbiol Infect Dis.* 1998;17:622;  
Germaud et al. *Rev Pneumol Clin.* 1999;55:83.



**VRE**

ASM MicrobeLibrary.org © Tomalty and Delisle

# Vancomycin-Resistant *Enterococci* (VRE) Among Intensive Care Unit Patients, 1995-2004

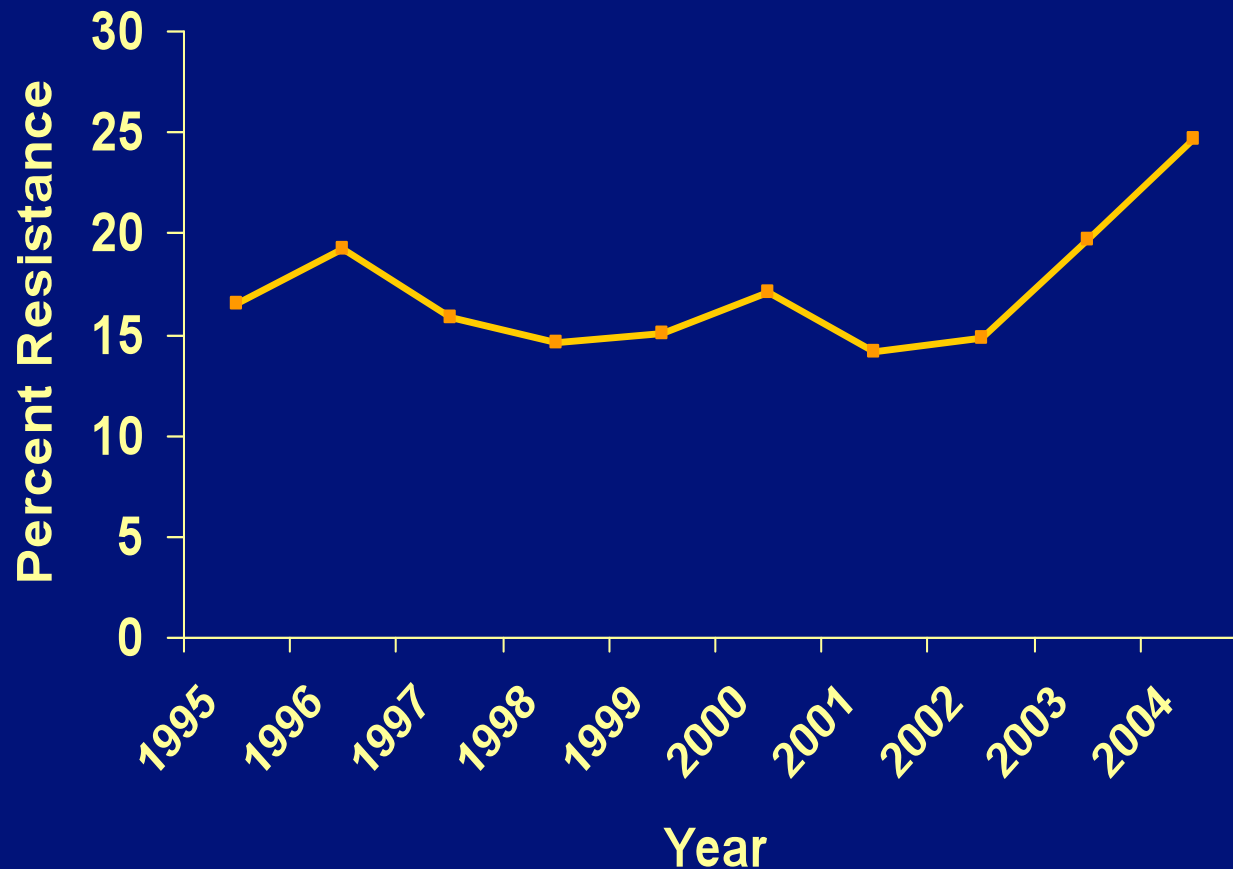


Source: National Nosocomial Infections Surveillance (NNIS) System

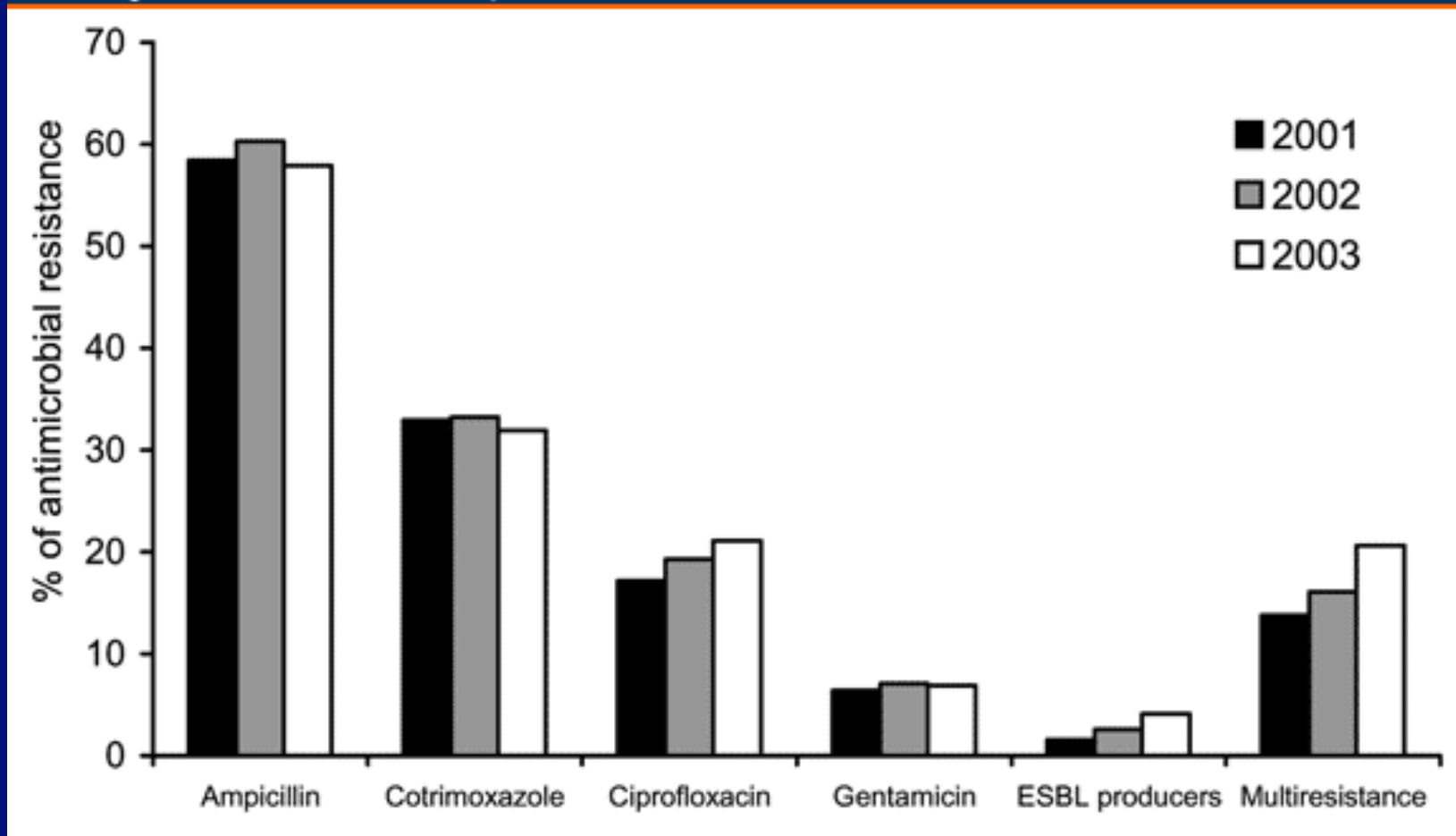


Resistant Gram-  
Negatives

# 3<sup>rd</sup> Generation Cephalosporin-Resistant *Klebsiella pneumoniae* Among Intensive Care Unit Patients, 1995-2004



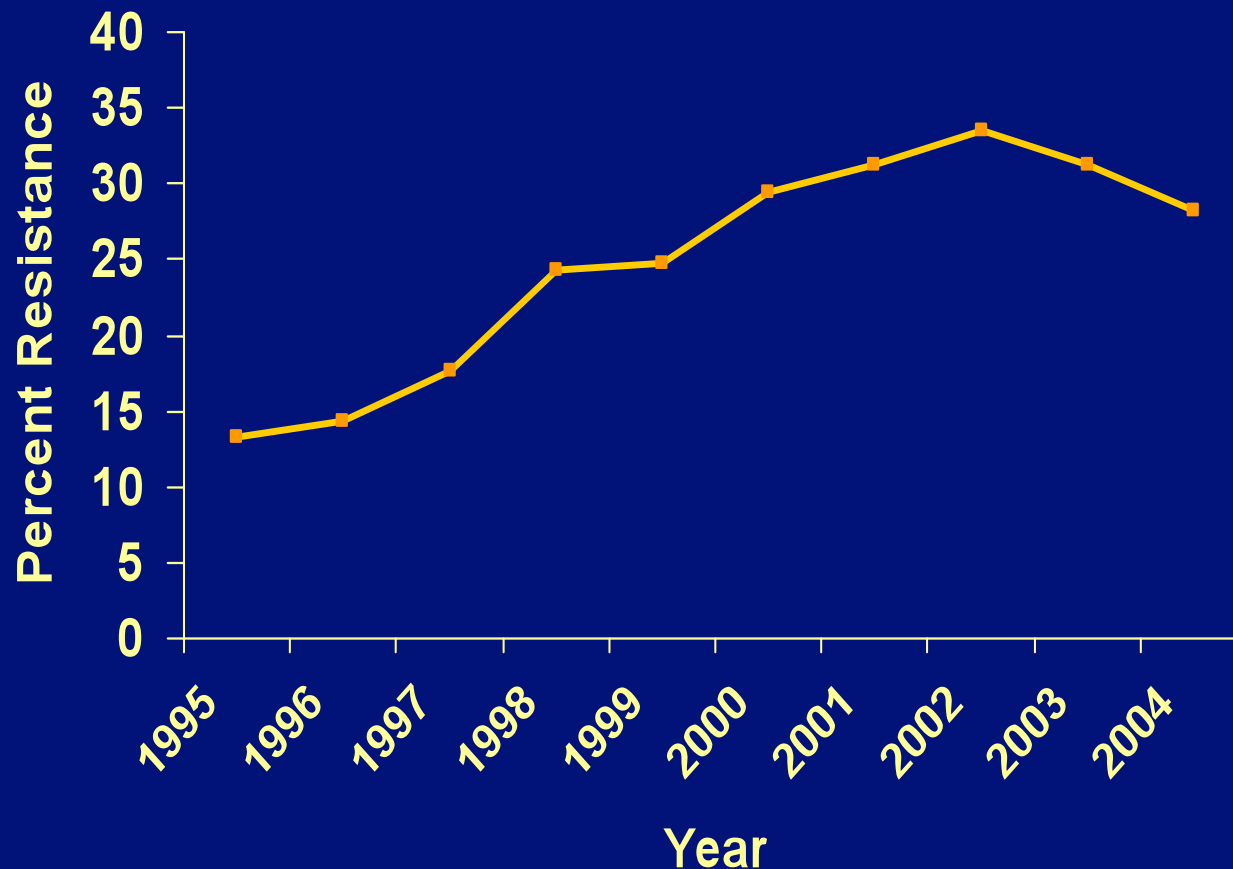
Source: National Nosocomial Infections Surveillance (NNIS) System



Source: Emerg Infect Dis © 2005 Centers for Disease Control and Prevention (CDC)

**Annual evolution of antimicrobial resistance in invasive *Escherichia coli* isolated by Spanish laboratories participating in European Antimicrobial Resistance Surveillance System, 2001-2003.**

# Fluoroquinolone-Resistant *Pseudomonas aeruginosa* Among Intensive Care Unit Patients, 1995-2004



Source: National Nosocomial Infections Surveillance (NNIS) System

# *Acinetobacter* spp.

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- High incidence of MDR (and even pan-resistance)
- Seen in wounds post Earthquake in Haiti
- High mortality when a cause of VAP or bacteremia (cause or marker of severe underlying disease?)
- Associated with post-neurosurgical infections
- Responsible for resurgence in the use of polymyxins

A microscopic image showing numerous dark, rod-shaped Clostridium difficile bacteria scattered across a light blue background. The bacteria are of varying lengths and some appear to be in pairs or small groups. There are also several large, irregular, orange-brown structures, likely fecal particles or mucus, interspersed among the bacteria. A blue rectangular box is overlaid on the center of the image, containing the text 'Clostridium difficile' in white. In the bottom right corner of the image, the text '22/40' is visible.

*Clostridium difficile*

22/40

# ***Clostridium difficile***

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- **INCREASING INCIDENCE**
  - Estimated >400,000 hospital cases annually in US
- **EPIDEMIC STRAIN**
  - A common resistant epidemic *C. difficile* strain called NAP-1 has been found in the US, Canada, and Europe.
  - This strain produces the binary toxin and has higher production of toxins A and B
- **MORE SEVERE**
  - Higher mortality and higher rates of colectomy
  - in the recent Quebec epidemic, >1400 deaths and a 17% attributable mortality

# Antimicrobial Resistance: International, national, and local problem

## Resistance in Haiti

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- 2010 Earthquake - USNS Comfort
  - 725 patient specimens submitted to microbiology lab
    - 266 +  $\geq$  1 organism (37%)
  - 160 urine cultures
    - 23% positive for bacteria –
      - *E. Coli* most frequent
        - 5/12 *E. coli* (42%) ESBL positive
      - *K. pneumoniae*
        - 3 of 4 ESBL positive
  - MDR *Acinetobacter* spp. Appeared early
    - 1<sup>st</sup> patient + meningitis from shore
    - After this patient was identified, surveillance performed in all ICU patients
      - 8 patients found to be infected (wounds)

# What is Antimicrobial Stewardship?

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- Antimicrobial stewardship involves the optimal selection, dose and duration of an antibiotic resulting in the cure or prevention of infection with minimal unintended consequences to the patient including emergence of resistance, adverse drug events, and cost.

**Ultimate goal is improved patient care and healthcare outcomes**

Dellit TH, et al. CID 2007;44:159-77,  
Hand K, et al. Hospital Pharmacist 2004;11:459-64  
Paskovaty A, et al IJAA 2005;25:1-10  
Simonsen GS, et al Bull WHO 2004;82:928-34

# Nationwide Survey on Antimicrobial Stewardship Program Characteristics

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- **8,000 nationwide providers surveyed (5% response rate)**
  - Pharmacy directors
  - ID pharmacists
- **51% had formal ASP**
- **63% of non-ASP institutions considered implementing a program**
  - **Common barriers:**
    - Staffing constraints
    - Funding constraints
- **Institutions with ASPs more likely to have:**
  - More admissions
  - Antibiograms
  - ID consult services
  - ID fellowship programs

# Institutions with Stewardship Programs: National Survey Results

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- Education techniques:

- Newsletter (56.8%)
- Grand Rounds (45.9%)
- Conferences (41.5%)
- None (6%)

- Stewardship techniques:

- IV to PO conversion (85.3%)
- Guidelines and clinical pathways (81.5%)
- Dose optimization (70.7%)
- Streamlining or de-escalation (62.5%)
- Closed formularies (59.8%)
- Antimicrobial order forms (41.8%)
- Antimicrobial cycling (3.3%)

- Restriction Methods:

- “Back end” approach (52.5%)
- Automatic stop orders (45.9%)
- ID consult required (44.3%)
- “Front end” approach (39.3%)
- None (0%)

- Commonly restricted antimicrobials

- Antifungals (72.7%)
- Linezolid (70.5%)
- Carbapenems (69.9%)
- Daptomycin (69.4%)
- Tigecycline (64.5%)
- Anti-Pseudomonals (57.4%)
- Fluroquinolones (44.8%)
- None (0%)

# Antimicrobial Therapy

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Appropriate initial  
antibiotic while improving  
patient outcomes and  
healthcare

Unnecessary  
Antibiotics, adverse  
patient outcomes and  
increased cost



## A Balancing Act

## Get SMART about antibiotic use!

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- Starting off – choosing the most appropriate empiric regimen
- Maintenance of therapy: Targeting, de-escalating, and discontinuing therapy
- Are you treating infection or colonization?
- Route: IV or PO
- Time: Stop antibiotics as early as possible

# *Get Smart: Know When Antibiotics Work*

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## Goals:

- promoting adherence to appropriate prescribing guidelines
- decreasing demand for inappropriate antibiotics

National campaign to target five conditions that accounted for >75% of all office based antibiotic prescribing:

- Otitis media
- Sinusitis
- Pharyngitis
- Bronchitis
- The common cold

# Get Smart Campaign

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- Otitis media visits children < 5 years, decrease in antimicrobials prescribed <sup>1</sup>
  - 1997: 69 antimicrobials/100 visits
  - 2007: 47.5 antimicrobials/100 visits
- Among children < 5 years, annual “acute respiratory tract infections” visit rates decreased by 17% <sup>2</sup>
- 25% reduction in antimicrobial use per outpatient office visit for presumed viral infections <sup>3</sup>

1. Grijakva CG, et al *JAMA* 302: 758-766, 2009.
2. Fendrick AM et al., *Arch Int Med*: 163(4): 487-94, 2003.
3. National Ambulatory Medical Care Survey (NAMCS).

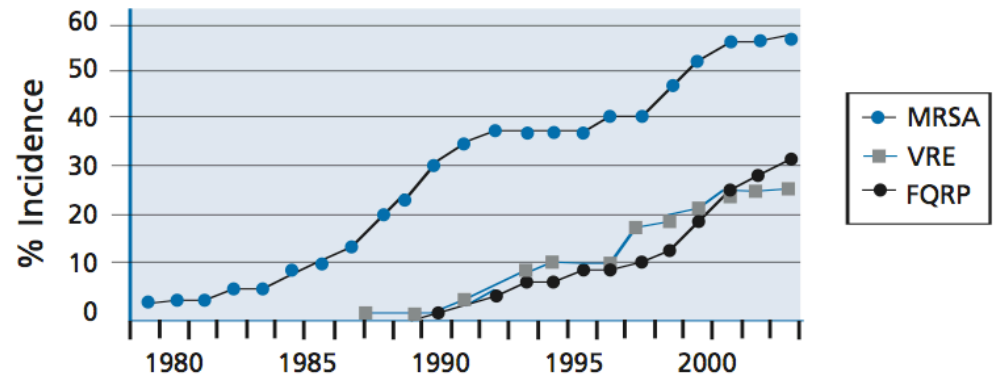
## Get Smart 2010

### Each year

- *2 million bacterial HAI*
- *90,000 people die*
- *More than 70% of these infections are resistant to at least one class of antibiotics*

### Antibiotic resistance is associated with:

- *Increased risk of hospitalization*
- *Increased length of stay*
- *Increased hospital costs*
- *Increased risk of ICU transfer*
- *Increased mortality*
- **Decreasing inappropriate antibiotic use is the best way to control resistance**



# Get Smart 2010

## Targeting Healthcare settings

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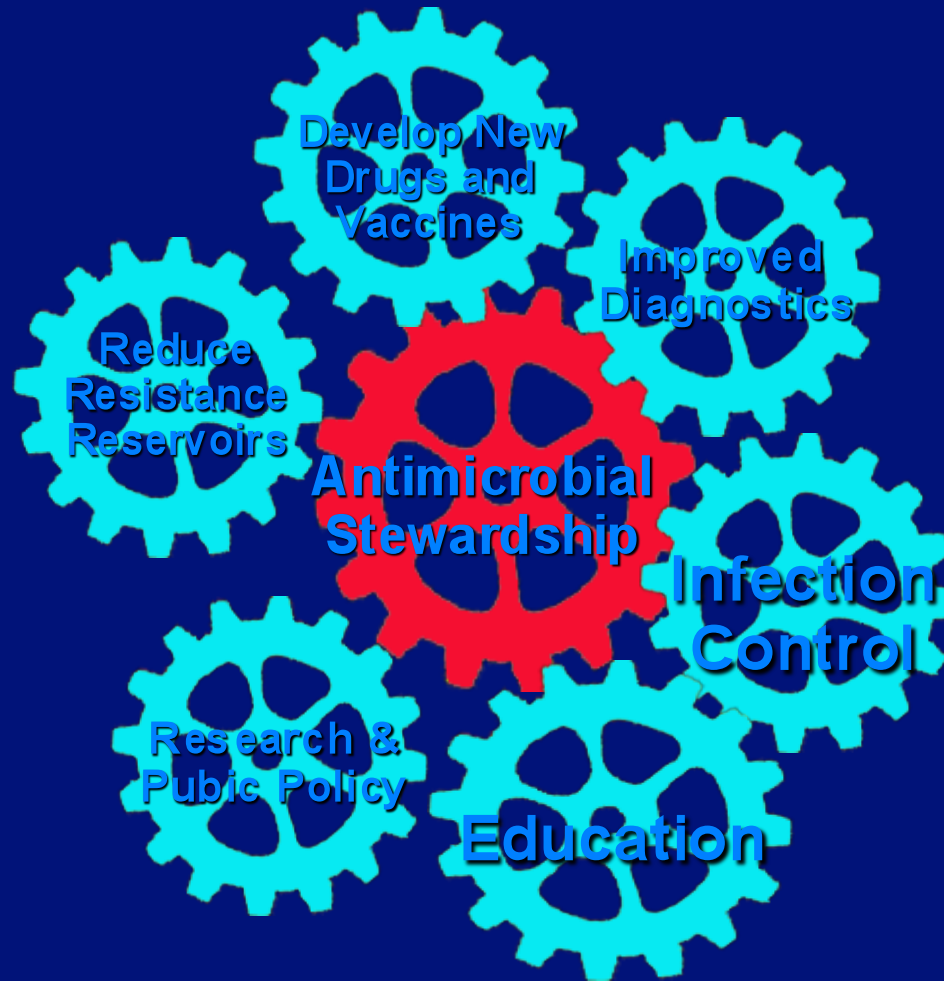
**Mission: To optimize the use of antimicrobial agents in inpatient healthcare settings**

Goals:

- Improve patient safety through better treatment of infections
- Reduce the emergence of antimicrobial resistant pathogens
- Encourage better use of antimicrobials in healthcare settings

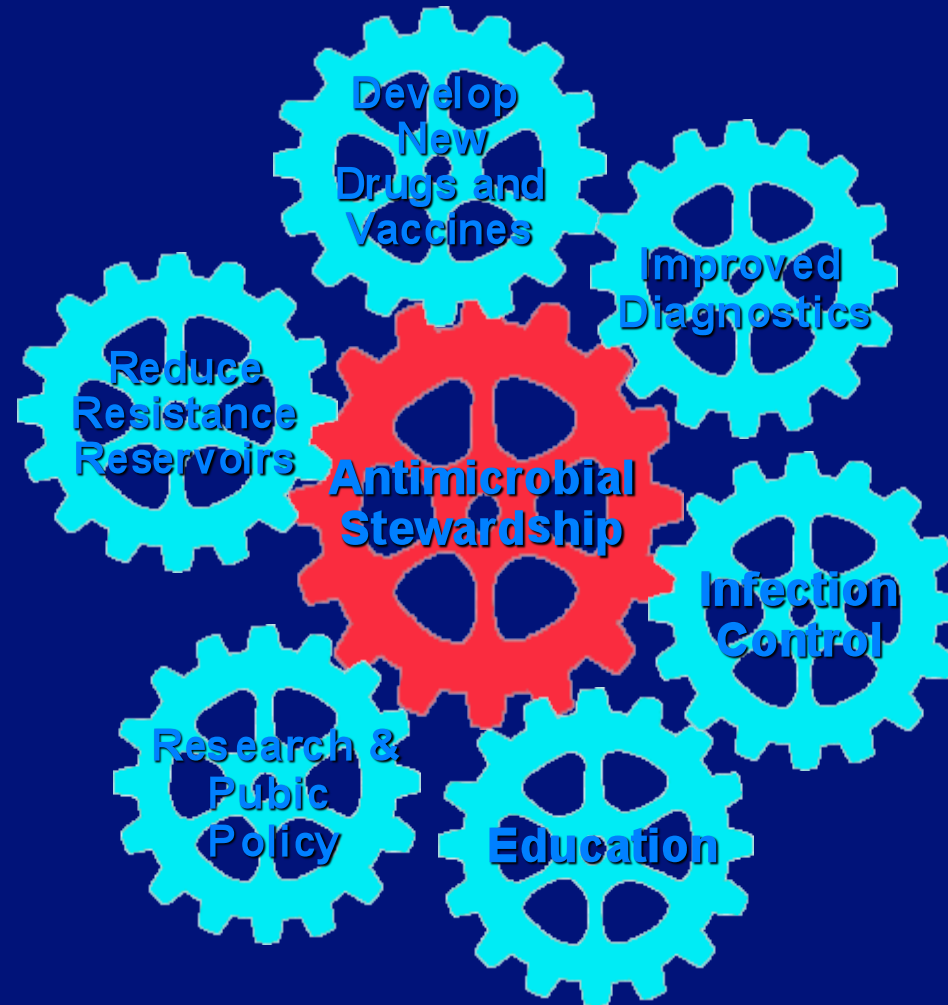
# Efforts to Improve Antimicrobial Prescribing and Control Resistance

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# Efforts to Improve Antimicrobial Prescribing and Control Resistance

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# Questions?

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# What is the single most important reason for healthcare workers to practice good hand hygiene?

1. To remove visible soiling from hands
2. To prevent transfer of bacteria from the home to the hospital
3. To prevent transfer of bacteria from the hospital to the home
4. To prevent infections that patients acquire in the hospital

# What is the single most important reason for healthcare workers to practice good hand hygiene?

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3. To prevent transfer of bacteria from the hospital to the home
4. To prevent infections that patients acquire in the hospital



# **OSHA's Hierarchy of Controls**

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- **Administrative controls e.g. monitoring and enforcement of protocols/policy and procedures**
- **Engineering Controls - Safe equipment or devices**
- **Work Practice Controls - e.g. no recapping of needles/sharps**
- **Personal Protective Equipment - gloves, fluid resistant gowns/aprons, faceshield**

## PROTECTIVE ISOLATION (Draft)

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- ***Strict Hand Hygiene BEFORE entering room!***
- **All visitors must be screened by Nursing. (Visitors with symptoms of contagious illness and/or recent exposure to contagious illness or some vaccines cannot enter.)**
- **Hepa-filtration and positive room air pressure**
- **Door must be kept closed**
- **No upholstered furniture/furnishings**
- **No flowers (fresh or dried) or potted plants**
- **Particulate respirator (N95) for the patient when leaving protective environment**

**GOOD HAND HYGIENE IS ESSENTIAL**

## Protective Isolation (back)

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- **Bone Marrow Transplant Patients - For induction chemotherapy and until day 100 post transplant or until fully engrafted.**
- **Solid Organ Transplants - For 4 months post transplant.**
- **Neutropenic Patients - Patients experiencing or anticipated to experience prolonged (10 days or more) neutropenia (total WBC x percentage of PMNs)  $<500$  per  $\text{mm}^3$**
- **Physician must order Low Bacterial Diet for dietary modifications to be implemented by Food Service.**

# Types of Precautions

**STANDARD PRECAUTIONS** – No Changes,  
applies to all blood, body fluids, mucous  
membranes from all patients

**EXPANDED PRECAUTIONS** – initiated for  
clinical suspicion/diagnosis of communicable  
illness (non- bloodborne) or immunosuppression

- Airborne
- Droplet
- Contact
- Modified Contact
- Droplet/Contact
- Airborne/Droplet/Contact
- Modified Standard
- Protective Isolation

# **“New” Expanded Precautions Signs**

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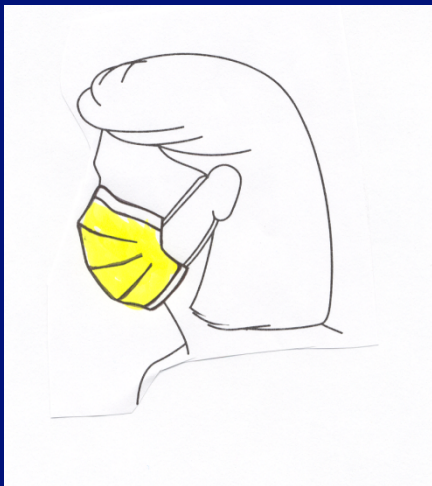
## Rationale:

- Too much variation on the part of HCWs in completing generic sign (HCW checks off/ chooses options)
- Too many write in modifications to generic sign +/- use additional hand made signs (with inaccurate information)

# DROPLET/CONTACT PRECAUTIONS

- **VISITORS:** REPORT TO NURSES' STATION BEFORE ENTERING ROOM
- **VISITANTES:** FAVOR DE ANUNCIARSE A LA ENFERMERA DE PISO ANTES DE ENTRAR AL CUARTO

探訪者請注意：在您進入任何病房之前，請先去護士站報到。



**SURGICAL MASKS** to enter room



**GLOVES** to enter room



**GOWNS** to enter room

**Keep contaminated hands away from eyes or face.**

**GOOD HAND HYGIENE IS ESSENTIAL**

## **DROPLET/CONTACT PRECAUTIONS (back)**

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- **ALL Pediatric Respiratory Illness (includes RSV, Adenovirus, Parainfluenza, Influenza)**
- **“Breakthrough” Chickenpox or chickenpox that occurs in adequately vaccinated patient**
- **RSV in Adults**
- **Cystic fibrosis patients with c. cepacia and/or other multi-drug resistant gram negative organisms**
  
- **NOTE TO STAFF: Keep hands away from eyes and face.**

**GOOD HAND HYGIENE IS ESSENTIAL**

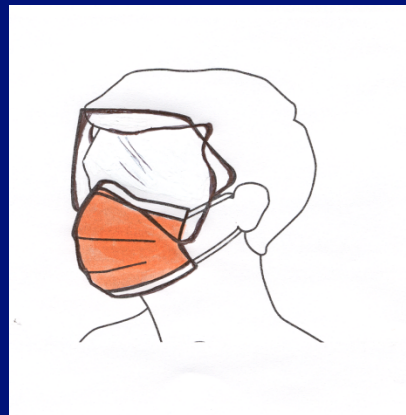
# AIRBORNE/DROPLET/CONTACT PRECAUTIONS

- **VISITORS:** REPORT TO NURSES' STATION BEFORE ENTERING ROOM
- **VISITANTES:** FAVOR DE ANUNCIARSE A LA ENFERMERA DE PISO ANTES DE ENTRAR AL CUARTO

探訪者請注意：在您進入任何病房之前，請先去護士站報到。



**N95 respirator to enter room**



**Face shield (over N95) or goggles to enter room**



**GLOVES to enter room**



**GOWNS to enter room**

**GOOD HAND HYGIENE IS ESSENTIAL**

## **AIRBORNE/DROPLET/CONTACT PRECAUTIONS (back)**

- **Chicken Pox / Disseminated Zoster**
- **SARS**
- **Smallpox**
- **Avian Influenza (Non-pandemic situation). In circumstances of pandemic influenza, may utilize Droplet and Standard Precautions only. Do not put contaminated hands near eyes or face.**
- **Negative Pressure Room required. Exceptions must be approved by Hospital Epidemiology/ Infection Control.**

**GOOD HAND HYGIENE IS ESSENTIAL**

## **MODIFIED STANDARD PRECAUTIONS**

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- **VISITORS:** REPORT TO NURSES' STATION BEFORE ENTERING ROOM
- **VISITANTES:** FAVOR DE ANUNCIARSE A LA ENFERMERA DE PISO ANTES DE ENTRAR AL CUARTO

探訪者請注意：在您進入任何病房之前，請先去護士站報到。

**DO NOT PROVIDE  
DIRECT CARE IF  
SUSCEPTIBLE TO  
CHICKENPOX**

**GOOD HAND HYGIENE IS ESSENTIAL**

## **MODIFIED STANDARD PRECAUTIONS (back of sign)**

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- **Localized *H. zoster* (shingles) in immunocompetent host**
- **Also post this sign (Modified Standard Precautions) in addition to Airborne/Droplet/Contact Sign, when suspect Varicella or Disseminated zoster.**

**GOOD HAND HYGIENE IS ESSENTIAL**

# Bloodborne Pathogen Exposure Protocol

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- Wash affected area with soap and water (if splash to eyes, perform eye rinse with tap water)
- REPORT ACCIDENT IMMEDIATELY to Emergency Room or per protocol
- Notify supervisor
- Follow-up based on specific circumstances and infection risk

# Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV)

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- **Bloodborne viruses**
- **Can produce chronic infection**
- **Transmissible in healthcare settings**
- **Data from multiple sources (e.g., surveillance, observational studies, serosurveys) used to assess risk of occupational transmission**

# Prevalence of Bloodborne Virus Infection in Patients

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- **Generally higher in hospitalized patients than general population**
- **Varies with geographic area**
- **Varies with patient group**

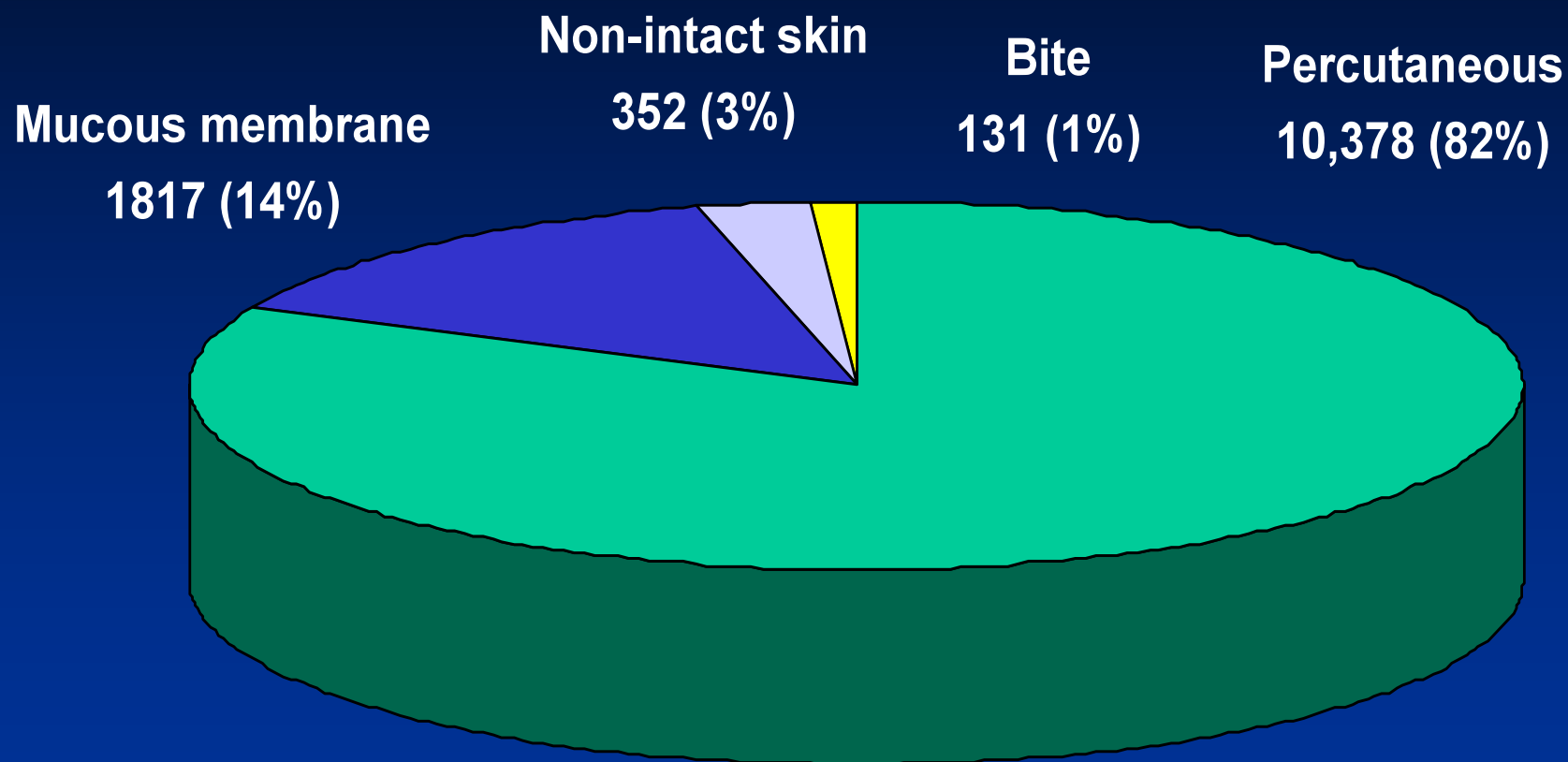
## U.S. HCWs with Documented and Possible Occupationally Acquired AIDS/HIV Infection, by Occupation, June 2001\*

<u>Occupation</u>	<u>Documented Transmission (#)</u>	<u>Possible Transmission (#)</u>
Health aide/attendant	1	15
Housekeeper/maintenance worker	2	13
Laboratory technician, clinical	16	17
Laboratory technician, nonclinical	3	----
Nurse	24	34
Physician, nonsurgical	6	12
Physician , surgical	----	6
Respiratory therapist	1	2
Technician, dialysis	1	3
Technician, surgical	2	2
Technician/therapist, other than above	----	9
Other healthcare occupations	----	4
<b>Total</b>	<b>56</b>	<b>117</b>

\* <http://www.cdc.gov/hiv/pubs/facts.htm#Transmission>

# Exposure Types for Blood/Body Fluid Exposures\* Reported to NaSH June 1995-December 2000

(n=12,678)



\* Excluding intact skin exposures and clean needlesticks. Exposures involving more than one site (4% of all exposures) are counted as one exposure according to the highest risk route for bloodborne virus transmission.



# Dynamics of Nosocomial Multi-Drug Resistance Pathogen Transmission

