

Reinventing the Wheel – The Public Discovers MRSA

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New York State Department of Health



**NEW YORK STATE
DEPARTMENT OF HEALTH**

Outline

- **MRSA**
- **JAMA Article – The Real Scoop**
- **Media Frenzy**
- **Ongoing NYSDOH MRSA Activities**
- **The Future?**

Colonization vs. Infection

- **Colonization**
 - Organism grown from non-sterile site
 - Patient has no symptoms
- **Infection**
 - Organism grown from any site
 - Patient has symptoms (e.g., fever)

Normal Flora

- All humans are colonized with bacteria
 - 'Non-sterile sites'

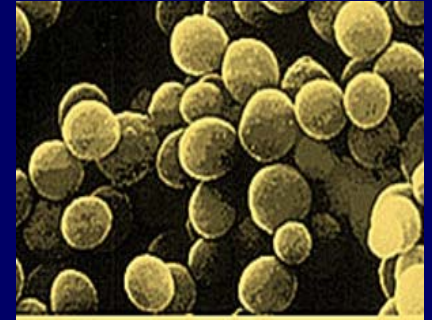
SKIN

Corynebacterium spp.
Propionibacterium acnes
Staphylococcus epidermidis
Streptococcus pneumoniae
Staphylococcus aureus
Streptococcus pyogenes
Neisseria spp.
Micrococcus spp.
Acinetobacter spp.
Murococcus spp.
Mycobacterium spp.
Various Fungi and Yeasts

NOSE

Corynebacterium spp.
Staphylococcus aureus
Streptococcus pneumoniae
Neisseria spp.
Streptococcus mitis
Streptococcus mutans
Enterococcus faecalis
Escherichia coli
Proteus spp.
Haemophilus influenzae

Staphylococcus aureus



- **Gram positive coccus**
- **Frequently carried in the nose and on the skin of healthy persons**
 - **Approximately 25-30% colonization rate**
- **Leading cause of skin and soft tissue infection (SSTI)**
 - **May cause more serious invasive disease**

Methicillin-resistant *Staphylococcus aureus* (MRSA)

- **Increasingly important cause of healthcare-associated infections since the 1960s**
- **Resistant to beta-lactam antibiotics**
 - Includes methicillin, penicillin, and amoxicillin
- **Causes same infections as methicillin-sensitive *S. aureus* (MSSA)**
 - Tend to be more aggressive
 - May be more challenging to treat
 - Estimated <10% all MRSA infections are invasive

Skin and Soft Tissue Infection

- Organism enters through breaks in skin
- Often described as 'spider bite'
- May be warm, tender, painful



Pimple

Abscess



Impetigo

Transmission

- **Skin-to-skin contact**
 - Colonized/infected skin with broken skin
 - Healthcare worker ↔ Patient
 - Athlete ↔ Athlete
- **Contact with contaminated items/surfaces**
 - Bedding, bandages, instruments
 - Razors, towels, creams, clothing
 - Gym mats, athletic equipment, cots

Five C's of MRSA Transmission

- Crowding
- Frequent skin-to-skin Contact
- Compromised skin
- Contaminated items/surfaces
- Inadequate Cleanliness

Treatment Options

- **Conservative management**
 - Hygiene, bandaging, observation
- **Incision and drainage**
 - Under sterile conditions only!!!
 - May be necessary for abscesses
- **Antibiotics**
 - Empiric approach is not recommended
 - Often requires culture and sensitivity testing
- **Re-evaluation for infections not improving within a few days**

Classification of MRSA infections

- **Healthcare-associated (HA-MRSA)**
- **Hospital-onset**
 - Culture positive >48 hours after admission to a healthcare facility
- **Community-onset**
 - Presence of an invasive device at time of admission
 - History of MRSA infection or colonization
 - History of healthcare exposure within 12 months

Classification of MRSA infections

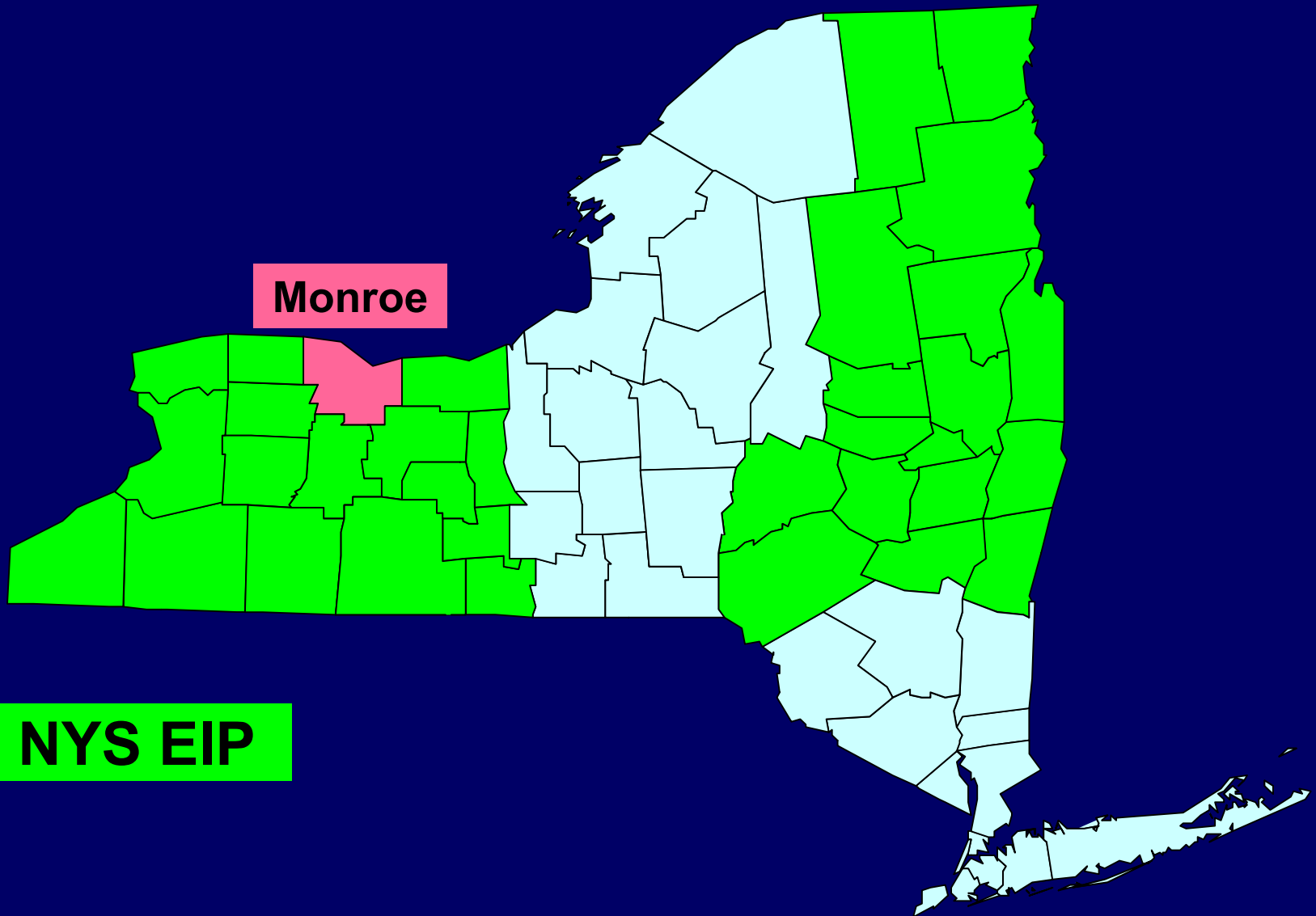
- **Community-associated (CA-MRSA)**
- **Diagnosis made:**
 - In outpatient setting, or
 - Within 48 hours of admission to a hospital or healthcare facility
 - No history of hospitalization or medical procedure (e.g., surgery, dialysis) within the past year
 - No history of HA-MRSA infection

**Invasive Methicillin-Resistant
Staphylococcus aureus Infections
in the United States**

JAMA 2007;298(15):1763-1771

**Centers for Disease Control and Prevention
Emerging Infections Program
Active Bacterial Core Surveillance**

New York State EIP Counties



Monroe

NYS EIP

Monroe County

- **Labs involved**
 - Rochester General Hospital
 - Strong Memorial Hospital
 - ACM lab
- **Hospitals involved**
 - Strong Memorial Hosp/ Highland Hospital
 - Rochester General Hospital
 - Park Ridge Hospital
 - Lakeside Hospital

Invasive MRSA Study Purpose

- **Describe invasive MRSA disease**
 - **Both HA- and CA-MRSA**
 - **Estimate magnitude of disease in U.S.**
 - **Estimate burden of disease in U.S.**

Invasive MRSA Study Findings

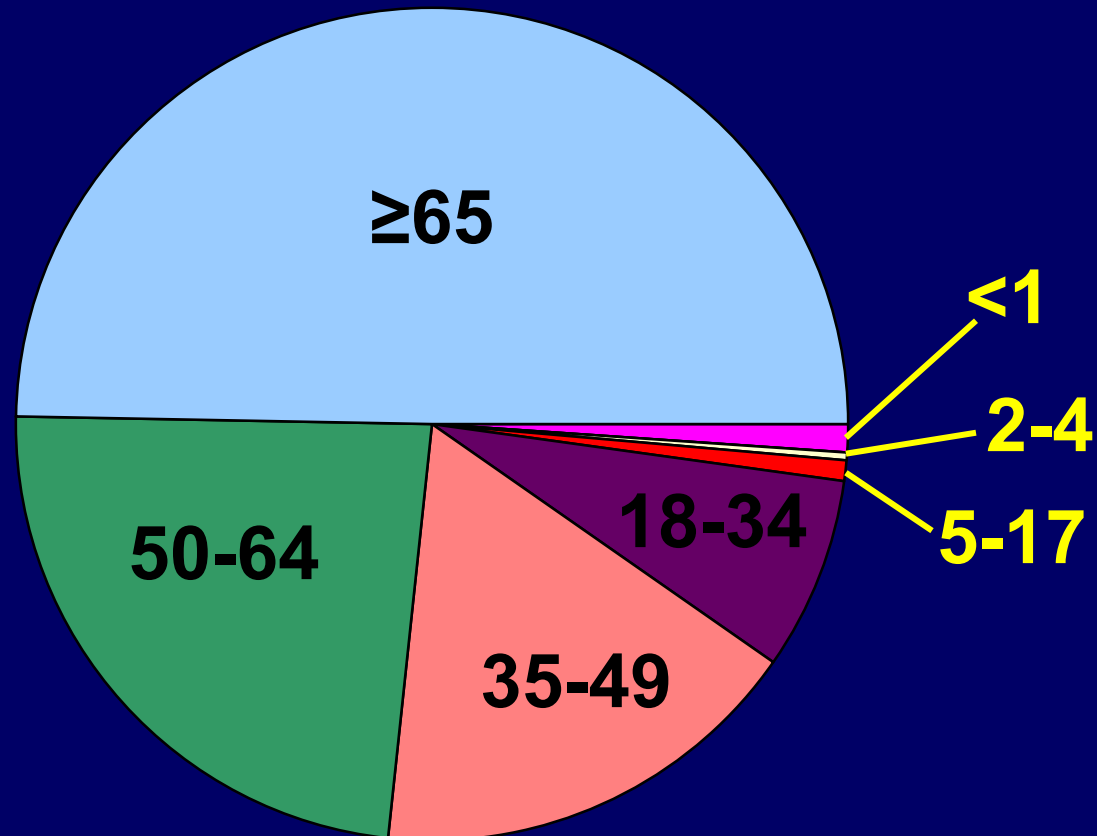
- **Standardized incidence rate, 2005**
 - **Invasive MRSA: 31.8 per 100,000**
 - **Mortality rate: 6.3 per 100,000**
 - **Represents 94,360 cases and 18,650 deaths**
- **Invasive CA-MRSA prominent**
 - **Over half have onset outside of healthcare**
 - **About 1 in 7 patients have no traditional risk factors of MRSA infection**

Invasive MRSA Study Findings

- **Strain type does not suggest transmission context**
 - CA-MRSA strains transmitted in healthcare settings
 - HA-MRSA strains transmitted in community settings
- **Serious invasive disease predominantly associated with healthcare exposure**
 - Over half occurred after recent hospitalization, surgery, or LTCF stay

Invasive MRSA Study Findings

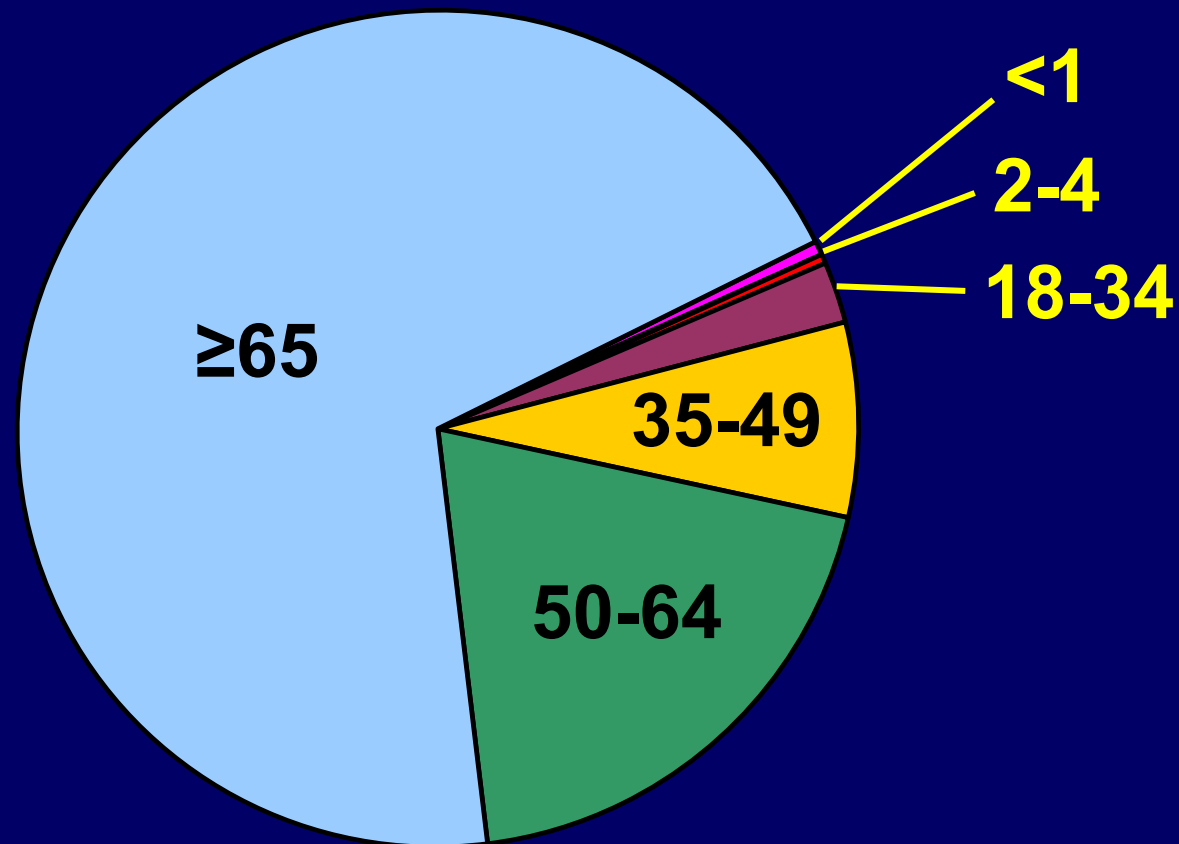
Estimated percent Invasive MRSA Infections
by Age Group - U.S., 2005



Note: 1yo = 0.2%

Invasive MRSA Study Findings

Estimated percent Invasive MRSA Deaths
by Age Group - U.S., 2005



Media Reports of ABCs Study

WebMD[®]

More U.S. Deaths From MRSA Than AIDS
In 2005, More Than 18,000 Deaths Attributed to MRSA,
CDC Reports

- **2005: 18,650 MRSA vs 17,011 AIDS deaths**
- **Based on separate estimates**
 - Acute versus chronic disease
 - Data not necessarily comparable
- **Different interpretations of message**
 - MRSA needs similar attention as AIDS in order to control
 - AIDS control has progressed significantly
 - MRSA is the AIDS of the 21st century

MRSA Media Frenzy

60 MINUTES

MRSA: Fighting The Superbug

newsday.com

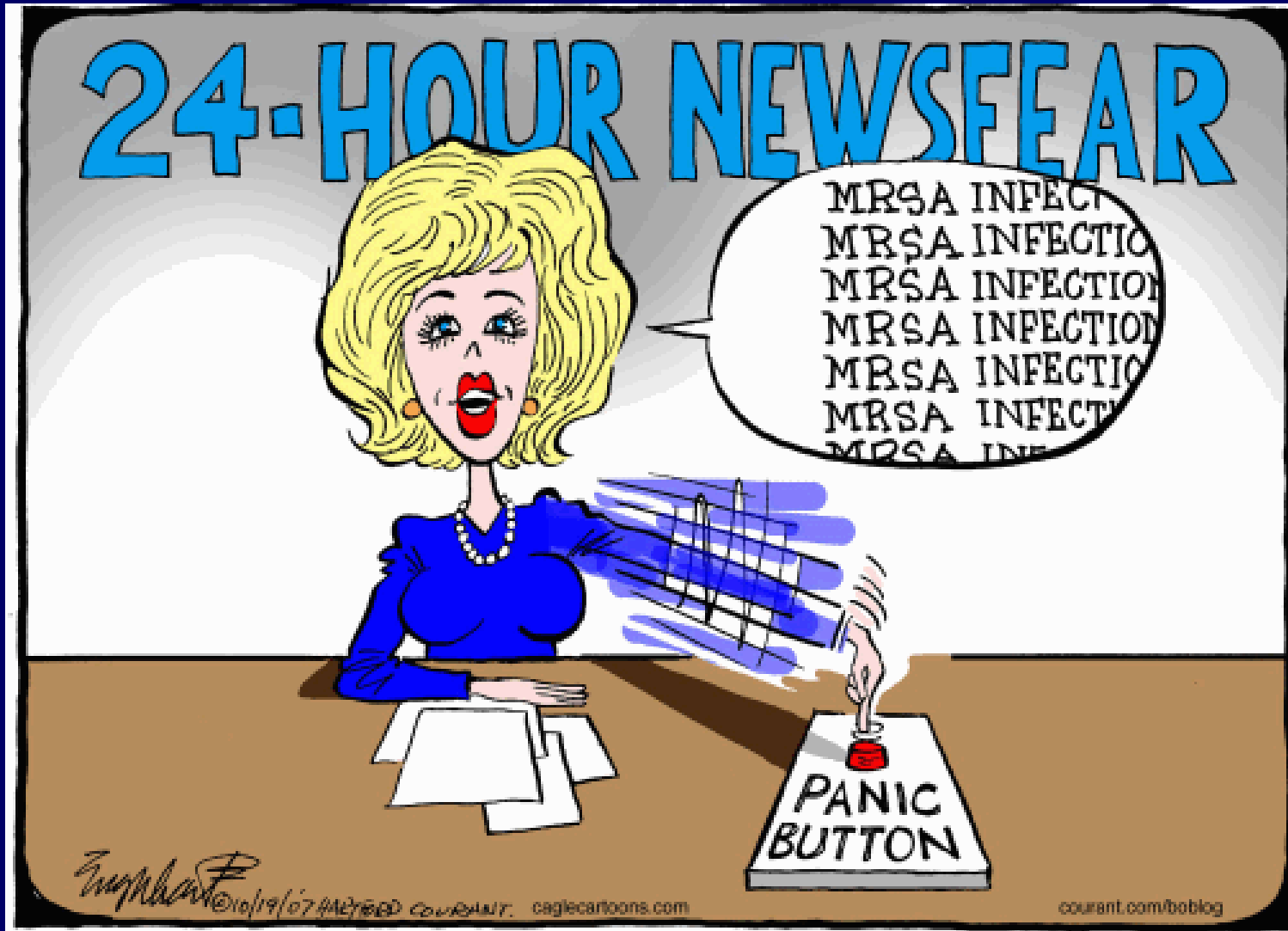
Family of Brooklyn boy who died of MRSA sues hospital.

THE BUFFALO NEWS

CITY & REGION

**MRSA case disclosed
at elementary school**

MRSA Media Frenzy



MRSA Media Frenzy

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Six States Report MRSA Infections, At Least Three Youths Have Died

Friday, October 19, 2007

FOX NEWS

School districts in at least six states Thursday reported students infected with MRSA, a super strain of drug-resistant staphylococcus bacteria that is responsible for the deaths of at least three children.

Ashton Bonds, 17, of Bedford, Va., died Monday as a result of the infection. Preschooler Catherine Bentley of Salisbury, N.H., and Shae Kiernan, 11, of Vancleave, Miss., both succumbed to the infection last week, officials said.

In addition, six football players at a North Carolina high school, seven students at three different West Virginia schools and at least two teens in Connecticut were diagnosed with the potentially deadly infection.

MRSA Media Frenzy

- **Brought MRSA to the spotlight**
- **Message was unclear**
 - Study did not discover an unknown 'super-bug'
- **Focused on fatalities**
 - Unfortunate simultaneous reports
- **Suggested schools and other facilities unsafe**
 - Schools conducted widespread disinfection
 - Hospitals introduced active surveillance cultures
 - Perceived pressure to eradicate MRSA

MRSA Myths

Myth

Truth

MRSA always causes infection

About 1% of the population is colonized with MRSA

MRSA is a 'superbug'

MRSA is one of many organisms of public health interest

MRSA infection cannot be treated

MRSA infection is treatable and curable

MRSA infection is inevitable

MRSA infection is preventable

"I want to reassure the public that staph is a common bacteria present in the environment and is not a threat to the average person. Some strains of staph are now resistant to the antibiotic methicillin, and may cause minor to serious infections under specific conditions.

"[I want to emphasize] how important common-sense precautions like hand-washing are in reducing MRSA infections.

"Community-Associated MRSA infection is preventable and treatable."

- Richard F. Daines, MD

New York State Commissioner of Health

Ongoing NYSDOH Activities

- **CA-MRSA**
 - MRSA outbreaks reportable through LHDs
 - Advisories written and distributed
 - Ongoing interaction and coordination
- **HA-MRSA**
 - MRSA rate increases reportable by facilities
 - CDC/HICPAC Two-Tiered MDRO Guidelines
 - Ongoing interaction and coordination

CA-MRSA Outbreak Reporting

- **Recent CA-MRSA Outbreaks**
 - 2003 - Kayakers; In-home tattooing
 - 2004 - College football team; Religious Community; Correctional facility
 - 2005 - College football team; Military cadets
 - 2006 - HS wrestling team
 - 2007 - HS football team; HS cheerleaders; College football team
 - 2008 - Tattoo parlor; In-home tattooing; OMH LTCF

CA-MRSA Outbreak Reporting

- **Outbreak reportability**
 - Baseline mostly unknown
 - No official electronic outbreak database
 - Difficult for NYSDOH to keep track of all outbreaks
- **Encourage more frequent reporting**
 - Not only to request involvement
 - Problem Alert notification system
 - Could enhance understanding of extent of MRSA in community

CA-MRSA Advisories

- **Provider advisory**
 - General information and management
- **School advisory**
 - School/activity exclusion
 - Environmental cleaning
 - Recommendations specific to athletics
- **Camp advisory**
 - Day and overnight camp
- **Day care advisory**
 - TBA

CA-MRSA Prevention and Control



STATE OF NEW YORK
DEPARTMENT OF HEALTH

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Richard F. Daines, M.D.
Commissioner

Wendy E. Saunders
Chief of Staff

[REDACTED] October 18, 2007

To: Hospitals, Nursing Homes, Health Care Providers and Local Health Departments

From: NYSDOH Bureau of Communicable Disease Control, Regional Epidemiology Program

**HEALTH ADVISORY: PREVENTION AND CONTROL OF COMMUNITY-ASSOCIATED
METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* (CA-MRSA)**

**Please distribute to the Infection Control Department, Medical Director,
Emergency Department, Infectious Disease, Dermatology, Director of Nursing,
Laboratory Directors, and all patient care areas.**

http://www.health.state.ny.us/diseases/communicable/staphylococcus_aureus/methicillin_resistant/community_associated/docs/health_advisory_2007-10-18.pdf

CA-MRSA Advisories

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Methicillin-Resistant *Staphylococcus Aureus* (MRSA)

What is a staph infection? What is MRSA?

"Staph," or *staphylococcus*, is a type of bacteria that naturally exist in the environment, including on people's skin. If the bacteria enter under the skin through a cut or scrape, the staph bacteria may cause skin infections that look like pimples or boils. Infections caused by staph may be red, swollen, painful, or have pus or other drainage. Most staph infections are minor and can be treated without antibiotics. Some staph infections resist treatment to a class of antibiotics and are known as Methicillin-Resistant Staphylococcus aureus or MRSA. This makes these infections harder to treat because it is resistant to the antibiotic most commonly used. There are however, a couple of other antibiotics to which the bacteria are susceptible and can be used to treat the infection.

Who is at risk for MRSA infection?

People who are generally healthy are not at high risk for MRSA infections. If they get a staph infection, they can usually fight it off. Staph infections, including MRSA infections, occur most frequently among people in hospitals and health-care facilities who have weakened immune systems. MRSA infections are becoming more common in the community, but are still rare.

Are school children at greater risk for MRSA infection?

The average child is not at increased risk. However, a child who participates in team and contact sports might be. Staph infects a person through skin-to-skin contact; the bacteria must get under the skin through openings such as cuts or abrasions. The risk increases if children share personal items, such as towels or razors. Staph-contaminated items and

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MRSA Media

PUBLIC SERVICE ANNOUNCEMENT

Ongoing CA-MRSA Activities

- **Collaboration with MSSNY**
 - Educational initiative for physicians
- **Collaboration with LHDs**
 - MRSA reportable in NYC
- **Legislative agenda**
 - Producing informational materials
 - Lobbying for appropriate measures
- **Communications**
 - Notify LHDs of press/public information requests and releases

HA-MRSA Reporting

- Number of MRSA outbreaks by year
 - As of April 30, 2008

Year	Hospitals	LTCFs	Total
2001	10	5	15
2002	16	3	19
2003	9	1	10
2004	11	4	15
2005	11	1	12
2006	15	3	18
2007	15	3	18
2008	2	0	2
Total	89	20	109

CDC/HICPAC MDRO Guidelines

- **Two-tiered approach**
- **Tier I**
 - Routine measures
 - Baseline prevention and control
- **Tier II**
 - Intensified control
 - Special temporary interventions
 - Reinforced baseline activity

CDC/HICPAC MDRO Guidelines

- **Six categories of measures:**
 - **Administrative Measures/Adherence Monitoring**
 - **Education**
 - **Judicious Antimicrobial Use**
 - **Surveillance**
 - **Infection Control Precautions**
 - **Environmental Measures**

CDC/HICPAC MDRO Guidelines

Tier I – Routine prevention

- Ongoing MDRO control program**
- Recognition of importance of MDRO control**
- Ongoing surveillance and rate monitoring**
- Standard precautions for all patients**
- Contact precautions for patients with a history of MRSA or who are found to be infected**

CDC/HICPAC MDRO Guidelines

Tier II – Intensified MDRO control

- Implement when routine control measures are not effective**
- Implement when first MDRO case identified**
- Implement when MDRO outbreak identified**

CDC/HICPAC MDRO Guidelines

Tier II – Interventions

- **Reinforce routine measures**
 - Education
 - Judicious antibiotic use
- **Administrative Measures**
 - Evaluate system for MRDO perpetuation
- **Expert consultation**
- **Ongoing feedback to staff/administration**

CDC/HICPAC MDRO Guidelines

Tier II – Interventions

- **Surveillance**
 - **Molecular analysis of isolates**
 - **Active surveillance cultures**
- **Infection Control**
 - **Contact precautions**
 - **Private room when feasible**
- **Environmental cleaning**
- **Decolonization**

Active Surveillance Cultures (ASC)

- **Culturing select populations for MDRO**
 - Risk for invasive disease
 - High prevalence
 - Independent of disease status
- **Purpose: Identify colonized patients**
 - Place under contact precautions
 - Target for decolonization

Pitfalls of ASC

- **Single strategy is ineffective**
 - ASC is not first or only response
- **Limited ability to maintain contact precautions**
- **Maintaining patient safety**
 - Cohorting based on non-primary diagnosis
- **Inadvertent broadening of antibiotic resistance**
 - e.g., multiple decolonization attempts

MRSA Risk Assessment

- **Must be based on past and current trends**
 - **Facility specific**
- **Evaluates efficacy of routine control measures**
 - **True measure of standard precautions**
- **Ongoing integrated multidisciplinary process**
- **Relies heavily on effective infection control program**

NYSDOH Infection Control Website



NEW YORK STATE



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Infection Control

Infection control is an essential component of any health care delivery. Infection control measures can be as simple as hand washing and as sophisticated as high-level disinfection of surgical instruments. Implementing these measures can prevent transmission of disease in health care settings and the community.

Infection control is a key concept in achieving the [New York State Department of Health mission](#) to protect and promote the health of New Yorkers through prevention, science and the assurance of quality health care delivery.

Hot Topics:

- [MRSA Alerts and Advisories](#)
- [Infection Control Letter to Physicians and Key Infection Control Points](#) (PDG, 4.0MB, 4pg.)
- [GI Advisory](#) (PDF, 44KB, 3pg.)
- [Flu Prevention and Control Guidelines](#)

Alerts, Advisories and Press Releases

Alerts and advisories are distributed to notify practitioners of the emergence of atypical pathogens, important changes in management of disease, or in the event of outbreaks of community or health care facility illness. This information can assist infection control practitioners and other health care providers in monitoring, identifying and controlling an outbreak.

- [Current Alerts and Advisories](#)

Prevention and Control Guidelines

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Ongoing HA-MRSA Activities

- **Statewide consistency**
 - Adherence to national guidance
- **Continue to encourage reporting**
 - Maintain infection control programs
 - Accurate nosocomial numbers
- **Communications**
 - Educate administration on need for consistent and supported infection control
 - Notify facilities of press/public information requests and releases

Conclusions

- **MRSA has and will be a part of our lives and work**
- **Media attention is positive and negative**
 - Public needs to understand relative risk
- **Measures in place to track disease trends**
 - Making reportable will likely not change recommendations
- **Local situation dictates management**
 - Knowledge of local prevalence and resistance patterns helpful

References

- **NYSDOH website**

http://www.health.state.ny.us/diseases/communicable/staphylococcus_aureus/methicillin_resistant/

- **CDC website**

http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca.html

References

- **Cornell NYS PIMS website (NYS registered products for MRSA)**

<http://magritte.psur.cornell.edu/pims>

- **NYSDOH Infection Control Website**

<http://www.health.state.ny.us/professionals/diseases/reporting/communicable/infection/index.htm>

Acknowledgments

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