APPENDIX T1: EXTENDED GUIDANCE

Outbreak Investigation Guidance for Community-Acquired MRSA

BACKGROUND

As per N.J.A.C. 8:57, isolated cases of community-associated methicillin-resistant Staphylococcus aureus (CA-MRSA) are not reportable to public health authorities. CA-MRSA is only reportable when an outbreak may be occurring. NJDOH defines a suspected outbreak of CA-MRSA as two or more non-household, culture-confirmed cases that occur within fourteen days of each other and may be epidemiologically linked (epi-linked).

As per N.J.A.C. 8:57, suspected outbreaks of communicable disease are reportable to the local health department (LHD) in the jurisdiction where the outbreak may be occurring. If the LHD determines that a suspect outbreak may indeed be occurring, they should immediately notify the NJDOH Infectious and Zoonotic Disease Program (IZDP). The NJDOH IZDP can be reached during business hours at (609) 826-5964 or during nights at weekends at (609) 392-2020. The NJDOH IZDP will provide technical assistance during the investigation and coordinate outbreak investigations that occur within multiple jurisdictions or in a state-run facility.

CA-MRSA is primarily transmitted through direct contact, and less frequently through contaminated environmental items. CA-MRSA is not reportable as a single case because the infection is not unusual and the pathogen is found throughout the community. Over thirty percent of the population is colonized with Staphylococcus aureus; colonization may be permanent or transient. Even pets can be colonized with CA-MRSA. As such, there is not incubation period for CA-MRSA, since individuals may be exposed in the community, at home or even through their own colonization. Most outbreaks of CA-MRSA never have an identified source; instead, public health investigations usually reveal breaches in hygiene or infection control where transmission could have occurred, or practices that may make the transmission of bacteria more likely.

- Testing of environmental items is rarely recommended, as the bacterium is ubiquitous.
- Routine cleaning is always recommended, but specialized cleaning is not usually effective, as environmental items may become re-contaminated from colonized individuals.
• Testing and treatment for colonization is rarely recommended, as individuals may become re-colonized after treatment, and exposure of cases could occur anywhere in the community. Given these facts, CA-MRSA investigations primarily involve debunking myths about the pathogen and transmission and trying to prevent individuals from panicking or implementing unnecessary measures that may be costly, intrusive and ineffective. Overall, CA-MRSA prevention messages involve changing personal behavior, such as practicing good hand hygiene, not sharing personal items and keeping abraded skin covered; as such, CA-MRSA investigations are a bit different from other public health investigations, such as food-borne outbreaks, where items can be tested and products can be recalled. The NJDOH recommends maintaining good communication with community settings during these investigations, and adhering to CDC and NJDOH guidelines whenever possible, so as to avoid setting costly and ineffective precedents or exacerbating an already difficult situation.

**STEPS AND GUIDELINES FOR MRSA OUTBREAKS**

1. When the LHD is notified about a suspected outbreak of CA-MRSA, the Health Officer, regional epidemiologist, public health nurse or communicable disease investigator should first determine if the situation meets the NJDOH definition of a suspected outbreak of CA-MRSA by doing the following:

   a. Gather and document information on the type of setting where the suspected outbreak may be occurring, including the type of location (e.g., school, correctional facility, residential treatment facility); general description and total number of the cases and population at-risk within the location (e.g., athletic team, classrooms / age group in a school, cell block in a correctional facility, wing of a residential facility); and a contact person and contact information within the facility.

   b. Gather and document more specific information on each suspected case of CA-MRSA, using the CA-MRSA General Linelist (see attached). The LHD should record this information during a phone interview with the initial caller or timely communication with the contact person for the facility, as it is important to make a quick determination if an outbreak may be occurring.

   c. Gather faxed / electronic copies of laboratory results for all culture-confirmed cases. If necessary, contact hospitals and clinicians to obtain these lab results. Since N.J.A.C. 8:57 allows for the collection of protected health information during a public health investigation, clinicians reporting this information to public health is exempt from HIPAA and consent from the patient is not needed. Verbal confirmation of a lab result during a phone conversation, hospital discharge summaries, notes from parents and verbal testimony from a case do not count as lab results and, as such, do not meet case definition for a confirmed case CA-MRSA.

2. Analyze the lab results and CA-MRSA General Linelist to determine if any of the MRSA culture-confirmed cases occurred within fourteen days of each other. Use the onset date to make this determination; if the onset date is not available, use the date the culture was collected. Be sure all cultures are for MRSA; any cases of methicillin-susceptible Staphylococcus aureus (MSSA) should not be included during this step. If two or more MRSA culture-confirmed cases occurred within fourteen days of each other, assign these a case classification of “confirmed” and
continue. If not, this report does not meet the NJDOH definition for a suspected outbreak of CA-MRSA and no further work is necessary. Explain to the caller that isolated cases of CA-MRSA are not unusual and therefore not reportable, and give basic information about disease transmission and prevention. Be sure the caller understands the LHD does not recommend a public health investigation, enhanced surveillance, notification of parents or staff, or any environmental remediation beyond routine housekeeping and routine infection control measures. Schools, correctional facilities, residential facilities and other community settings may decide to use this opportunity to reinforce messages of practicing good hand hygiene, not sharing personal items and keeping wounds covered.

3. For all reports with a case classification of “confirmed:” analyze these cases to determine if they may be related. There is no concrete rule for determining if cases may be related; this determination should be made considering both case data and information about the community setting. The following are examples of related and unrelated cases in various community settings.

   a. Cases are related if they share a common characteristic, such as students in the same grade or classroom; students who are athletes and attend the same school, workout in the same gym, or participate in a common sport tournament; inmates on the same cell block; inmates who share a work-duty assignment or participate in a common recreational activity; and patients / clients who reside on the same floor at a residential treatment facility, or participate in a common activity at the facility.

   b. Cases that do not share a known link within a specific time-frame are likely not related. Examples of cases that are not related include students in the same school district but different schools; students at the same school but vastly different classrooms with no potential for interaction (e.g., a second grader and sixth grader who do not know each other, share common friends or participate in a common activity); and a student with a culture-confirmed infection in September and a student with a culture-confirmed infection in January. Household cases are not reportable, such as siblings with CA-MRSA infections (although this a good opportunity for the LHD to review the importance of MRSA prevention measures to minimize transition among family members).

4. If a determination is made that two or more culture-confirmed cases occurred within 14 days of each other and may be related, a CA-MRSA outbreak may be occurring and the LHD should expand the initial investigation. The LHD should now do the following:

   a. Contact the NJDOH IZDP again to obtain an E-number and discuss next steps planned in the investigation. The E-number should be written on all documents and communication pertaining to the investigation.

   b. Develop outbreak case definitions for the investigation. Outbreak case definitions should be based on a defined period of time that begins two weeks prior to the onset or specimen collection date of the earliest culture-confirmed case and the setting where the cases are occurring. As the investigation progresses, the outbreak case definitions may be modified to accommodate newly identified cases. The outbreak case definitions should include, at minimum, three classifications: confirmed, probable, and not a case. A fourth category for possible cases may be used, but is not required.
c. Implement enhanced surveillance for CA-MRSA and skin and soft tissue infections (SSTIs) within the affected community setting. Although single cases of MRSA are not reportable to public health, during an outbreak investigation, all cases of MRSA should be reported to the LHD conducting the investigation, even if a culture was not performed. Enhanced surveillance may be discontinued one month after the onset date of the last case. Since CA-MRSA is not unusual, unrelated cases may be detected during enhanced surveillance and should be classified as not a case.

d. Identify a media or spokesperson in each of the affected facilities / agencies, including the LHD, NJDOH and the community setting. The spokesperson in each agency / facility should serve as the point of contact for the media, parents and other potential stakeholders. The spokesperson for each agency / facility should share and review all letters, press statements, website updates and prior to external distribution. The LHD should review letters sent to parents to be sure the information is accurate and does not compromise confidentiality. All statements to the press should be reviewed by the LHD and NJDOH, to ensure the number of confirmed cases and potential sources are accurate. It is important to maintain credibility by keeping all parties informed and information consistent before information is distributed to parents, the media and the general public.

e. Design survey instruments to gather additional data about the cases. Survey instruments should include a standardized interview form for cases and a standardized interview form for individuals working with the affected population. For example, if all confirmed cases are athletes, a standardized interview form should be designed for the cases and a separate form should be designed for athletic coaches, trainers and athletic facility directors. By interviewing individuals who work with the affected population, the LHD may discover information about potential risk factors, such as shared equipment, direct contact with abraded skin or improper wound care.

f. Administer surveys to cases and other relevant individuals. Confirmed, probable and possible should be interviewed using the same form. If cases are minors, the interviews should be conducted by school officials (e.g., school nurse) or by the LHD on school property and must include parental consent. Interviews can be administered on the phone or in person, but should not be done through the mail, as this does not allow for the timely collection of data during an outbreak investigation. It is recommended that LHDs involve facility administrators in the interview process, so as to keep all stakeholders informed and ensure support from the administration.

g. Document more detailed case and survey information in a second, more specific CA-MRSA linelist. The NJDOH has several template linelists available for use, including a CA-MRSA School Linelist for Outbreak Investigation (see attachment) and a CA-MRSA Correctional Facility Linelist for Outbreak Investigation (see attachment). These linelists should serve as guidance for interviewing cases, clinicians and other relevant individuals. The LHD may need to create a new linelist or expand the existing templates to include variables unique to the investigation. It is recommended that LHDs maintain an electronic copy of the linelist, using a program such as MS Excel or EpiInfo, for ease of analyzing data and sharing de-identified data as appropriate.

h. Request information about the community setting that may be relevant to the epi link. This may involve obtaining floor plans for residential or correctional facilities, obtaining practice
and game schedules for athletic teams, speaking to facility clinicians about routine protocols for the identification and treatment of SSTIs, and obtaining information about routine cleaning schedule for common areas and shared equipment.

i. If appropriate, schedule an environmental and facility inspection. The LHD should involve their registered environmental health specialist (REHS) in this step. Although CA-MRSA is primarily transmitted through direct contact, there may be contaminated environmental items or, more likely, environmental practices that hinder MRSA prevention strategies. For example, the best way to prevent MRSA includes practicing good hand hygiene, so an environmental inspection should include an evaluation of hand washing stations, for both availability and functionality.

5. Formulate a hypothesis on transmission. Given that CA-MRSA is a community pathogen with ongoing exposure and has no quantifiable incubation period, the source of community outbreaks is usually never identified. Cases are primarily transmitted through direct contact, and colonized individuals may even self-inoculate through skin that has become abraded after contact sports or other activities. Although a source of the outbreak may never be identified, public health can still provide useful information by identifying potential modes of transmission that occurred or may occur, and issuing guidelines to minimize future infections. For CA-MRSA, it is not recommended to pursue molecular analysis of clinical specimens, as the predominant strains of CA-MRSA are found throughout the United States and genotyping cannot establish a unique source or vehicle for transmission. In addition, it is not recommended to culture asymptomatic individuals for MRSA colonization. Identifying a carrier for MRSA does not mean the individual is the source of infection or became colonized during the outbreak, as CA-MRSA is a pathogen found throughout the community. Testing for colonization is only recommended when there is a confirmed outbreak in a small, closed population that does not interact with the community, such as a hospital burn unit or neo-natal intensive care unit.

6. Prepare recommendations for the facility. This should involve issuing recommendations that are specific to deficiencies found in the facility and recommendations that are routine to the prevention of CA-MRSA. The following areas should be evaluated for relevance to the community setting and the current outbreak and included in the recommendations, if appropriate:

a. MRSA education, including brochures, signs, videos and presentations, with an emphasis on hand hygiene, not sharing personal items, proper wound care and timely recognition / treatment of SSTIs. Education should be directed toward individuals and staff.

b. Documented routine cleaning plan, with a specialized plan for areas that are higher risk for bacterial growth and frequent contamination, such as locker rooms, spas and wrestling mats. The cleaning plan should be directed toward housekeeping staff, although other individuals may participate through practices such as cleaning with a spray bottle after using gym equipment and disposing of dirty linens in the proper receptacles. For cleaning environmental items, almost any household cleaning product is effective, and the EPA has a document with a list of products that have been approved for use against MRSA (provide link here?). A more specialized cleaning product may be appropriate for high risk areas, such as wrestling mats and other shared sports equipment. The cleaning plan should also address linens, towels and clothing and routine availability of laundry services routine availability of laundry services (e.g., inmates in correctional facility should have frequent
opportunities to wash their sheets, towels and clothing). Again, almost any laundry detergent is effective, and water does not have to be scalding to effectively clean linens. The cleaning plan should also include disinfecting areas where medical care may be administered or contact may occur with abraded skin, such as the exam table for a personal or athletic trainer.

c. Environmental remediation, as identified by the public health investigation. This may include things such appropriately stocked and conveniently located hand-washing stations and / or hand sanitizer dispensers and receptacles for dirty laundry and sports equipment.

d. Documented surveillance protocol for SSTIs, where clinical staff is instructed on how to recognize and handle suspect infections in a timely manner. This plan may be expanded to include coaches, trainers and other athletic staff, so all suspect SSTIs can be referred to the nurse’s office for clinical evaluation. For correctional facilities, the plan should include timely evaluation of all SSTI-related sick calls to the infirmary.

e. Documented response protocol for CA-MRSA, including when cases will be excluded from activities, how cases will be housed, special instructions for cleaning staff and special instructions for notification to parents, caregivers or visitors. The response protocol should be based on guidelines from public health and should be enforced for all future cases. Examples of things that should be addressed in a school response plan include excluding athletes in high contact sports, such as wrestling; sending home notification to parents only when public health authorities have determined that an outbreak may be occurring (i.e, isolated case notification is not recommended); not excluding students from school; and not closing the school for special cleaning when cases are identified. Having a documented response plan will maintain consistency, avoid overreaction and assist facilities when they respond to future inquiries regarding potential outbreaks or even routine, isolated cases of CA-MRSA.

7. Prepare a final report for the LHD and NJDOH. The final report should be submitted to the NJDOH within 30 days of final contact with the community setting where the outbreak occurred; this may be after written recommendations have been distributed, or after enhanced surveillance has been discontinued and no new related cases have been identified.

FURTHER RESOURCES

CDC, NJDOH websites for CA-MRSA; the EPA website for products recommended for disinfecting against MRSA; the Federal Bureau of Prisons website for MRSA.

Download the full Communicable Disease Outbreak: New Jersey’s Public Health Response at http://njlmn2.rutgers.edu/exchange/njaccho-outbreak-investigation-manual