

## HIV Drug Resistance and Subtype Surveillance

The Minnesota Department of Health (MDH) STD and HIV Section and Public Health Laboratory have incorporated HIV (human immunodeficiency virus) drug resistance and subtype surveillance into routine HIV surveillance. This activity—Variant, Atypical, and Resistant HIV Surveillance (VARHS)—enables MDH to describe and monitor the prevalence of HIV drug resistance and subtypes among individuals newly diagnosed with HIV in Minnesota. Minnesota’s disease reporting rules were revised in 2005 to require submission of clinical materials from newly diagnosed cases of HIV infection. (See “Revisions to the Communicable Disease Reporting Rules” in the May/June 2005 [vol. 33, no. 3] issue of the *Disease Control Newsletter*.) Starting September 1, 2005, HIV drug resistance testing and

viral subtype determination is being conducted on all eligible specimens.

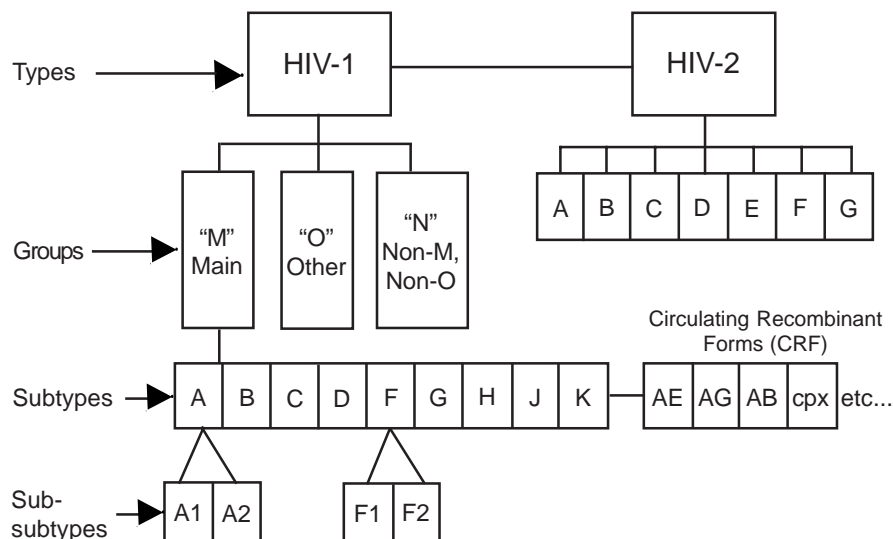
Of the two types of HIV (HIV-1 and HIV-2), HIV-1 is most responsible for the global AIDS (acquired immunodeficiency syndrome) pandemic. It is also more genetically diverse (Figure 1). HIV subtypes are differentially distributed around the world. For example, HIV-1 subtype B is most prevalent in North America, Western Europe, and Australia; subtypes A, C, D, and A/G are most common in Africa.

As a result of travel and migration, the HIV epidemic in Minnesota has become more genetically diverse. In 2003, MDH piloted HIV-1 subtyping with routine surveillance to describe the existence and variety of non-subtype B strains. Recently published

data from that pilot study<sup>1</sup> indicate that at least 7 non-B HIV-1 subtypes are present in the state. These variant subtypes appear to be limited to persons born outside the United States. Figure 2 depicts the distribution of subtypes among non-African clients diagnosed with HIV at the Hennepin County Health Department Red Door Clinic, a public sexually transmitted disease clinic, between January 2003 and March 2004 (targeted surveillance) alongside the distribution of subtypes among a sample of African patients being treated for HIV infection at three Twin Cities infectious disease clinics (sentinel surveillance). HIV genetic diversity is also exhibited in the form of mutations that confer resistance to antiretroviral (ARV) drugs. Because HIV has both a high mutation and a high replication rate, ARV drug resistance is a common response to the selective pressure of HIV drugs and complicates treatment. Drug resistance testing is one tool clinicians use to select an appropriate ARV drug regimen for patients. This testing is routinely employed before

**continued...**

**Figure 1. HIV Nomenclature**



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selecting a first regimen or when switching ARV drug regimens. However, there is disagreement about the value in obtaining a drug resistance test at initial exam. Current treatment guidelines recommend drug resistance testing at initial exam if the prevalence of primary drug resistance (ie, HIV drug resistance acquired at transmission rather than in response to ARV drugs) in the population of newly diagnosed case-patients is 5% or greater. Unfortunately, little is known about the frequency of transmitted HIV drug resistance in the United States and even less about the frequency in Minnesota.

HIV subtype and drug resistance surveillance will help address the public health and clinical challenges presented by the extensive genetic variation HIV-1 possesses. Knowledge

about the prevalence of different HIV subtypes and drug resistance among newly diagnosed cases of HIV infection will inform treatment recommendations, HIV drug and biotechnology development, diagnostic testing, and vaccine development.

#### Surveillance Methods

Specimens will be received primarily from laboratories that conduct confirmatory HIV diagnostic testing. However, clinical sites that diagnose and/or treat HIV patients, as well as other HIV testing sites, will be responsible for ensuring that laboratories used for confirmatory HIV testing comply with Minnesota disease reporting rules.

Specimen eligibility for HIV subtype and drug resistance testing will be assessed upon receipt at the MDH

Public Health Laboratory. Eligible specimens include those from persons who

- are diagnosed with HIV infection;
- have not been previously diagnosed with HIV infection more than 12 months prior;
- have not been exposed to ARV drugs;
- have not already received HIV drug resistance and subtype testing through this surveillance program; and
- reside in Minnesota.

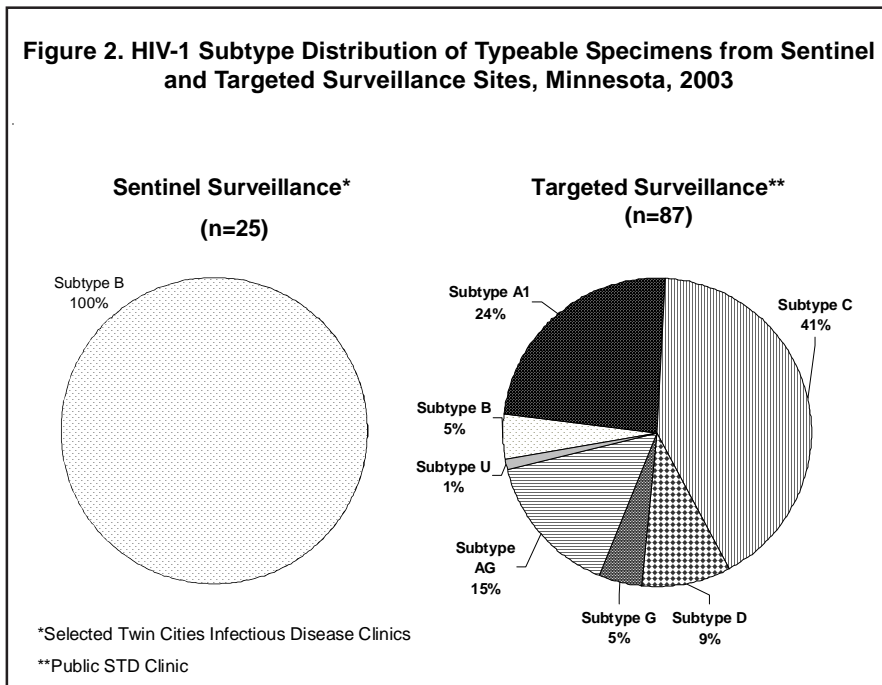
Results of subtype and genotypic drug resistance testing will be returned to HIV surveillance staff and included in the MDH surveillance case record. Patients may indicate a physician or other healthcare provider to receive a copy of the subtype and drug resistance test results at the time of diagnosis or any time thereafter. Physicians may request a copy of a patient's subtype and drug resistance test results for purposes of medical treatment.

MDH is conducting client and provider education programs to inform stakeholders about this new aspect of HIV surveillance. For more information, go to MDH's Web site for HIV surveillance: [www.health.state.mn.us/divs/idepc/diseases/hiv/hivstatistics.html](http://www.health.state.mn.us/divs/idepc/diseases/hiv/hivstatistics.html) or contact Tracy Sides, HIV Surveillance Coordinator, at (612) 676-5461 or at [tracy.sides@health.state.mn.us](mailto:tracy.sides@health.state.mn.us).

#### Reference

1. Sides TL, Akinsete O, Henry K, Wotton JT, Carr PW, Bartkus J. HIV-1 subtype diversity in Minnesota. *JID*. 2005;192:37-45.

**Figure 2. HIV-1 Subtype Distribution of Typeable Specimens from Sentinel and Targeted Surveillance Sites, Minnesota, 2003**



## Recent Infectious Disease Publications by MDH Staff

Listed below is a sampling of more than 20 recently published (2005) articles written by or in conjunction with Minnesota Department of Health (MDH) staff. These articles would not be possible without the assistance of physicians, laboratorians, and infection control practitioners from around the state. The abstracts are supplied by PubMed. Names of MDH staff are highlighted in bold.

1. Fridkin SK, Hageman JC, Morrison M, Sanza LT, **Como-Sabetti K**, Jernigan JA, **Harriman K**, Harrison LH, **Lynfield R**, Farley MM. Methicillin-resistant *Staphylococcus aureus* disease in three communities. *N Engl J Med*. 2005;352:1436-1444.

BACKGROUND: Methicillin-resistant *Staphylococcus aureus* (MRSA) infection has emerged in patients who

do not have the established risk factors. The national burden and clinical effect of this novel presentation of MRSA disease are unclear. METHODS: We evaluated MRSA infections in patients identified from population-based surveillance in Baltimore and Atlanta and from hospital-laboratory-based sentinel surveillance of 12 hospitals in Minnesota. Information was obtained

by interviewing patients and by reviewing their medical records. Infections were classified as community-associated MRSA disease if no established risk factors were identified. RESULTS: From 2001 through 2002, 1647 cases of community-associated MRSA infection were reported, representing between 8 and 20 percent of all MRSA isolates. The annual disease incidence varied according to site (25.7 cases per 100,000 population in Atlanta vs. 18.0 per 100,000 in Baltimore) and was significantly higher among persons less than two years old than among those who were two years of age or older (relative risk, 1.51; 95 percent confidence interval, 1.19 to 1.92) and among blacks than among whites in Atlanta (age-adjusted relative risk, 2.74; 95 percent confidence interval, 2.44 to 3.07). Six percent of cases were invasive, and 77 percent involved skin and soft tissue. The infecting strain of MRSA was often (73 percent) resistant to prescribed antimicrobial agents. Among patients with skin or soft-tissue infections, therapy to which the infecting strain was resistant did not appear to be associated with adverse patient-reported outcomes. Overall, 23 percent of patients were hospitalized for the MRSA infection. CONCLUSIONS: Community-associated MRSA infections are now a common and serious problem. These infections usually involve the skin, especially among children, and hospitalization is common. Copyright 2005 Massachusetts Medical Society.

**2. Kiang KM, Ogunmodede F, Juni BA, Boxrud DJ, Glennen A, Bartkus JM, Cebelinski EA, Harriman K, Koop S, Faville R, Danila R, Lynfield R.** Outbreak of osteomyelitis/septic arthritis caused by *Kingella kingae* among child care center attendees. *Pediatrics*. 2005;116:e206-213.

OBJECTIVE: *Kingella kingae* often colonizes the oropharyngeal and respiratory tracts of children but infrequently causes invasive disease. In mid-October 2003, 2 confirmed and 1 probable case of *K. kingae* osteomyelitis/septic arthritis occurred among children in the same 16- to 24-month-old toddler classroom of a child care center. The objective of this study was to investigate the epidemiology of *K. kingae* colonization and invasive disease among child care attendees. METHODS: Staff at the center were

interviewed, and a site visit was performed. Oropharyngeal cultures were obtained from the staff and children aged 0 to 5 years to assess the prevalence of *Kingella* colonization. Bacterial isolates were subtyped by pulsed-field gel electrophoresis (PFGE), and DNA sequencing of the 16S rRNA gene was performed. A telephone survey inquiring about potential risk factors and the general health of each child was also conducted. All children and staff in the affected toddler classroom were given rifampin prophylaxis and recultured 10 to 14 days later. For epidemiologic and microbiologic comparison, oropharyngeal cultures were obtained from a cohort of children at a control child care center with similar demographics and were analyzed using the same laboratory methods. The main outcome measures were prevalence and risk factors for colonization and invasive disease and comparison of bacterial isolates by molecular subtyping and DNA sequencing. RESULTS: The 2 confirmed case patients required hospitalization, surgical debridement, and intravenous antibiotic therapy. The probable case patient was initially misdiagnosed; MRI 16 days later revealed evidence of ankle osteomyelitis. The site visit revealed no obvious outbreak source. Of 122 children in the center, 115 (94%) were cultured. Fifteen (13%) were colonized with *K. kingae*, with the highest prevalence in the affected toddler classroom (9 [45%] of 20 children; all case patients tested negative but had received antibiotics). Six colonized children were distributed among the older classrooms; 2 were siblings of colonized toddlers. No staff (n = 28) or children aged <16 months were colonized. Isolates from the 2 confirmed case patients and from the colonized children had an indistinguishable PFGE pattern. No risk factors for invasive disease or colonization were identified from the telephone survey. Of the 9 colonized toddlers who took rifampin, 3 (33%) remained positive on reculture; an additional toddler, initially negative, was positive on reculture. The children of the control child care center demonstrated a similar degree and distribution of *K. kingae* colonization; of 118 potential subjects, 45 (38%) underwent oropharyngeal culture, and 7 (16%) were colonized with *K. kingae*. The highest prevalence again occurred

in the toddler classrooms. All 7 isolates from the control facility had an indistinguishable PFGE pattern; this pattern differed from the PFGE pattern observed from the outbreak center isolates. 16S rRNA gene sequencing demonstrated that the outbreak *K. kingae* strain exhibited >98% homology to the ATCC-type strain, although several sequence deviations were present. Sequencing of the control center strain demonstrated more homology to the outbreak center strain than to the ATCC-type strain. CONCLUSIONS: This is the first reported outbreak of invasive *K. kingae* disease. The high prevalence in the affected toddler class and the matching PFGE pattern are consistent with child-to-child transmission within the child care center. Rifampin was modestly effective in eliminating carriage. DNA sequence analysis suggests that there may be considerable variability within the species *K. kingae* and that different *K. kingae* strains may demonstrate varying degrees of pathogenicity.

**3. Laine ES, Scheftel JM, Boxrud DJ, Vought KJ, Danila RN, Elfering KM, Smith KE.** Outbreak of *Escherichia coli* O157:H7 infections associated with nonintact blade-tenderized frozen steaks sold by door-to-door vendors. *J Food Prot*. 2005;68:1198-1202.

Steaks have not been recognized as an important vehicle of *Escherichia coli* O157:H7 infection. During 11 to 27 June 2003, the Minnesota Department of Health (MDH) identified four O157 infection cases with the same pulsed-field gel electrophoresis (PFGE) subtype. All four case patients consumed brand A vacuum packed frozen steaks sold by door-to-door vendors. The steaks were blade tenderized and injected with marinade (i.e., nonintact). Information from single case patients in Michigan and Kansas identified through PulseNet confirmed the outbreak. The MDH issued a press release on 27 June to warn consumers, prompting a nationwide recall of 739,000 lb (335,506 kg) of frozen beef products. The outbreak resulted in six culture-confirmed cases (including one with hemolytic uremic syndrome) and two probable cases in Minnesota and single confirmed cases in four other states. The outbreak PFGE subtype of O157 was isolated from unopened brand A bacon-continued...

wrapped fillets from five affected Minnesota households. A fillet from one affected household was partially cooked in the laboratory, and the same O157 subtype was isolated from the uncooked interior. The tenderizing and injection processes likely transferred O157 from the surface to the interior of the steaks. These processing methods create new challenges for prevention of O157 infection. Food regulatory officials should reevaluate safety issues presented by nonintact steak products, such as microbiologic hazards of processing methods, possible labeling to distinguish intact from nonintact steaks, and education of the public and commercial food establishments on the increased risk associated with undercooked nonintact steaks. Information on single cases of O157 infection in individual states identified through PulseNet can be critical in solving multistate outbreaks in a timely manner.

4. **Kiang KM**, Kieke BA, **Como-Sabeti K**, **Lynfield R**, Besser RE, Belongia E. Clinician knowledge and beliefs after statewide program to promote appropriate antimicrobial drug use. *Emerg Infect Dis.* 2005;11:904-911.

In 1999, Wisconsin initiated an educational campaign for primary care clinicians and the public to promote judicious antimicrobial drug use. We evaluated its impact on clinician knowledge and beliefs; Minnesota served as a control state. Results of pre- (1999) and post- (2002) campaign questionnaires indicated that Wisconsin clinicians perceived a significant decline in the proportion of patients requesting antimicrobial drugs (50% in 1999 to 30% in 2002;  $p < 0.001$ ) and in antimicrobial drug requests from parents for children (25% in 1999 to 20% in 2002;  $p = 0.004$ ). Wisconsin clinicians were less influenced by nonpredictive clinical findings (purulent nasal discharge [ $p = 0.044$ ], productive cough [ $p = 0.010$ ]) in terms of antimicrobial drug prescribing. In 2002, clinicians from both states were less likely to recommend antimicrobial agent treatment for the adult case scenarios of viral respiratory illness. For the comparable pediatric case scenarios, only Wisconsin clinicians improved significantly from 1999 to 2002. Although clinicians in both states improved on several survey

responses, greater overall improvement occurred in Wisconsin.

5. **Castor ML**, **Wagstrom EA**, **Danila RN**, **Smith KE**, **Naimi TS**, **Besser JM**, **Peacock KA**, **Juni BA**, **Hunt JM**, **Bartkus JM**, Kirkhorn SR, **Lynfield R**. An outbreak of Pontiac fever with respiratory distress among workers performing high-pressure cleaning at a sugar-beet processing plant. *J Infect Dis.* 2005;191:1530-1537.

**BACKGROUND:** In August 2000, the Minnesota Department of Health was notified of and investigated an outbreak of febrile respiratory illness among workers at a sugar-beet processing plant. **METHODS:** A case was defined as fever and respiratory symptoms occurring in a worker at the sugar-beet plant on or after 31 July 2000. Case patients were interviewed, medical and work records were reviewed, and clinical samples were obtained. The plant was inspected, and environmental samples were collected. **RESULTS:** Fourteen of 15 case patients performed high-pressure water cleaning in the confined space of an evaporator vessel. Symptoms included fever and chills (100%), chest tightness (93%), cough (80%), and shortness of breath (73%). In case patients, median temperature was 39.4 degrees C, median oxygen saturation was 93%, and median white blood cell count was  $12 \times 10^3$  cells/ $\mu$ L. Four (29%) of 14 case patients showed evidence of *Legionella pneumophila* exposure, according to serologic testing. Water sources contained up to  $10(5)$  cfu/mL of *L. pneumophila* and 22,200 endotoxin units/mL. **CONCLUSIONS:** Outbreak features were consistent with Pontiac fever. Respiratory symptoms, which are atypical for Pontiac fever, could be attributed to a high exposure dose of *L. pneumophila* from confined-space aerosolization or to endotoxin exposure. This outbreak demonstrates the potential occupational hazards for those performing high-pressure cleaning in confined spaces.

6. **Smith KE**, Anderson F, **Medus C**, **Leano F**, **Adams J**. Outbreaks of salmonellosis at elementary schools associated with dissection of owl pellets. *Vector Borne Zoonotic Dis.* 2005;5:133-136.

*Salmonella enterica* serotype Typhimurium outbreaks occurred at

two elementary schools after science club students dissected owl pellets. Forty primary cases were identified (26 culture-confirmed). At the first school, pellets were dissected on a cafeteria table, concurrent with after-school child care in the cafeteria. Subsequently, the table was not sanitized before use by after-school care students for snack, or before the next school lunch. At the second school, pellets were dissected in a dedicated science room, and fewer cases occurred. Pellets in both outbreaks originated from a single captive barred owl. The outbreak pulsed-field gel electrophoresis subtype of *S. Typhimurium* was isolated from the owl's pellets and feces, and from four frozen chicks from a batch used to feed the owl.

7. **Rainbow J**, **Cebelinski E**, **Bartkus J**, **Glennen A**, **Boxrud D**, **Lynfield R**. Rifampin-resistant meningococcal disease. *Emerg Infect Dis.* 2005;11:977-979.

Rifampin-resistant meningococcal disease occurred in a child who had completed rifampin chemoprophylaxis for exposure to a sibling with meningococemia. Susceptibility testing of 331 case isolates found only 1 other case of rifampin-resistant disease in Minnesota, USA, during 11 years of statewide surveillance. Point mutations in the RNA polymerase Beta subunit (*rpoB*) gene were found in isolates from each rifampin-resistant case-patient.

8. **Ogunmodede F**, Jones JL, **Scheffel J**, Kirkland E, Schulkin J. Listeriosis prevention knowledge among pregnant women in the USA. *Infect Dis Obg Gyn.* 2005;13:11-15.

**BACKGROUND:** Listeriosis is a food-borne disease often associated with ready-to-eat foods. It usually causes mild febrile gastrointestinal illness in immunocompetent persons. In pregnant women, it may cause more severe infection and often crosses the placenta to infect the fetus, resulting in miscarriage, fetal death or neonatal morbidity. Simple precautions during pregnancy can prevent listeriosis. However, many women are unaware of these precautions and listeriosis education is often omitted from prenatal care. **METHODS:** Volunteer pregnant women were recruited to complete a questionnaire to assess

their knowledge of listeriosis and its prevention, in two separate studies. One study was a national survey of 403 women from throughout the USA, and the other survey was limited to 286 Minnesota residents. **RESULTS:** In the multi-state survey, 74 of 403 respondents (18%) had some knowledge of listeriosis, compared with 43 of 286 (15%) respondents to the Minnesota survey. The majority of respondents reported hearing about listeriosis from a medical professional. In the multi-state survey, 33% of

respondents knew listeriosis could be prevented by not eating delicatessen meats, compared with 17% in the Minnesota survey ( $p=0.01$ ). Similarly, 31% of respondents to the multi-state survey compared with 19% of Minnesota survey respondents knew listeriosis could be prevented by avoiding unpasteurized dairy products ( $p=0.05$ ). As for preventive behaviors, 18% of US and 23% of Minnesota respondents reported avoiding delicatessen meats and ready-to-eat foods during pregnancy, whereas 86%

and 88%, respectively, avoided unpasteurized dairy products. **CONCLUSIONS:** Most pregnant women have limited knowledge of listeriosis prevention. Even though most respondents avoided eating unpasteurized dairy products, they were unaware of the risk associated with ready-to-eat foods. Improved education of pregnant women regarding the risk and sources of listeriosis in pregnancy is needed.

## Delusional Parasitosis

Many physicians have encountered patients who claim to be parasitized by mites, fleas, lice, worms, or other unidentified organisms. While some patients may have parasitic infestations, many are suffering from a psychiatric condition known as delusional parasitosis (DP), also called delusions of parasitosis. This condition is the mistaken belief that one is infested by ectoparasites or infected with internal parasites. Often, because of the delusion, it is impossible to convince the patient that the infestation is not real. This article summarizes approaches to diagnosis and treatment of this clinically challenging disorder.

### Patient Presentation

Typically, DP patients are older women, but younger people (including men) can be affected. Other than their delusion, patients usually appear to be normal. Most patients describe the infestation as being on or just under the skin, in or around body openings, or internal (particularly in the stomach or intestines). They often believe that the parasites are also widespread in the environment, especially in their homes. The typical DP patient has suffered from the infestation for some time and has seen numerous physicians and other professionals (eg, parasitologists, entomologists, and exterminators). Many patients describe previously seen medical professionals as uncaring and incompetent. The Minnesota Department of Health (MDH) receives many calls from DP patients with such stories. The calls increase in the winter months coinciding with drier conditions in homes. The patients often submit abundant samples of human tissue, lint, scabs, dust, and other objects for

identification as parasites and strongly reject negative findings by those who examine these samples. Self-mutilation can occur in severe cases. The wounds appear in areas accessible to the patient, where they have attempted to excavate the parasites. Many DP patients have tried a long list of remedies, including potentially dangerous levels of pesticides. Patients often have detailed records of their findings, complete with diagrams of the suspected parasite. In some cases, the patient's medical history is convincing enough that family members secondarily share the delusion. It is also not uncommon to hear accounts of excessive cleaning/disinfecting of the home environment.

### Diagnosis

The diagnosis of DP is a lengthy process involving the following steps:

1. Take a careful case history.
2. Perform a complete physical examination and laboratory evaluation, including skin scrapings and/or biopsies, blood counts, chemistry profile, thyroid function tests, and vitamin B12 levels.
3. Rule out other medical conditions (eg, diabetes, atopic dermatitis, and lymphoblastomas) with skin manifestations that can appear to be caused by arthropods.
4. Work with entomologists or parasitologists to rule out true infestations (eg, scabies mites, animal mites, lice, fleas, and bed bugs).
5. Rule out other organic causes (eg, allergies and contact dermatitis).
6. Rule out history of drug abuse (especially in younger or male patients).

### Clinical Management

The most effective management of DP cases is a team approach among healthcare providers, dermatologists, psychiatrists, and entomologists or parasitologists. The primary healthcare provider should take the lead in incorporating all of the above disciplines into the patient's care. The provider should take special care in suggesting to the patient that he or she may be suffering from a mental disorder. While there is often resistance by patients to seek psychiatric help, many will do so if they are told that psychiatrists may help them to live better with their parasite problem. Psychiatrists are needed to confirm the diagnosis and to provide long-term treatment, including therapy with antipsychotic drugs such as pimozide. Healthcare providers should avoid empiric treatment with lice or scabies medications without evidence of an infestation, as this may exacerbate the condition. MDH is available to help identify unknown arthropods that are submitted through a physician. Please call 612-676-5414 for identification assistance.

### References

Significant portions of this article were adapted from two references that provide more detailed discussion and additional references:

1. Murray, WJ. Delusional parasitosis. *Clin Microbiol Newsl*. 2004;26:73-77.
2. University of California, Davis, Bohart Museum of Entomology. Delusional parasitosis. Available at: <http://delusion.ucdavis.edu/>. Accessed September 2005.

# Meningococcal Vaccine

## Disease Background

Meningococcal disease is a rare but deadly bacterial infection caused by *Neisseria meningitidis*. The disease often begins with influenza-like symptoms (fever, headache, stiff neck, vomiting) but can quickly progress (within 48 hours) to serious complications such as meningitis, sepsis, shock, or death. *N.meningitidis* is transmitted through the exchange of respiratory and throat secretions, usually through close, personal contact. In Minnesota, disease rates for serotypes A, C, Y, and W-135 drop to their lowest levels in the pre-adolescent age group, but start climbing and peak at ages 18-19, at a rate of 1.3 per 100,000 (Figure 1). The best way to prevent meningococcal disease is to vaccinate those at risk of contracting the disease.

## New Meningococcal Vaccine Now Available

In January, the U.S. Food and Drug Administration approved a new meningococcal conjugate vaccine (MCV4), Menactra, for use in persons aged 11 through 55 years. Menactra, like Menomune, the meningococcal polysaccharide vaccine (MPSV4), protects against four serogroups of *N. meningitidis*: A, C, Y, and W-135. With the addition of this new vaccine, there

are now two meningococcal vaccines available in the United States; Sanofi Pasteur manufactures both products.

Available since 1981, MPSV4, like other polysaccharide vaccines, is a T cell-independent antigen, which limits its effectiveness in children younger than 18 months and results in a reduced anamnestic response (immunologic memory). MPSV4 has proven clinical efficacy (85%) against serogroups A and C and demonstrates immunogenicity against serogroups Y and W-135. Its duration of protection is estimated to be 3 to 5 years.

The efficacy for the new vaccine, MCV4, was inferred by demonstrating that the serologic response to the vaccine was not inferior to MPSV4. MCV4 has been shown to elicit a significant rise in antibody level and has a similar, sometimes higher, final antibody titer than MPSV4. The duration of protection with MCV4 is currently unknown, but based on data collected for a national immunization program against group C meningococcal disease conducted in the United Kingdom, protection appears to last at least 8 years. In addition, because MCV4 is a conjugated vaccine, a boosting dose produces a strong anamnestic

response. It is also hoped that there will be a decrease in nasopharyngeal carriage of *N. meningitidis* following vaccination with MCV4, thus eliciting herd immunity protection.

The safety profiles for the two vaccines are quite similar. Systemic reactions were rare for both. MCV4 had higher rates of local reaction than MPSV4. MCV4 is given intramuscularly, whereas MPSV4 is given subcutaneously. Providers should take note of the correct route of administration as it may impact the effectiveness of the vaccine.

## New Meningococcal Immunization Recommendations

In response to the availability of the new conjugated meningococcal vaccine, the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention approved new meningococcal immunization recommendations in February 2005. The goal of the recommendations was to reduce the burden of disease in the age groups for which the disease rates begin to rise following infancy. ACIP recommends routine immunization of the following age groups:

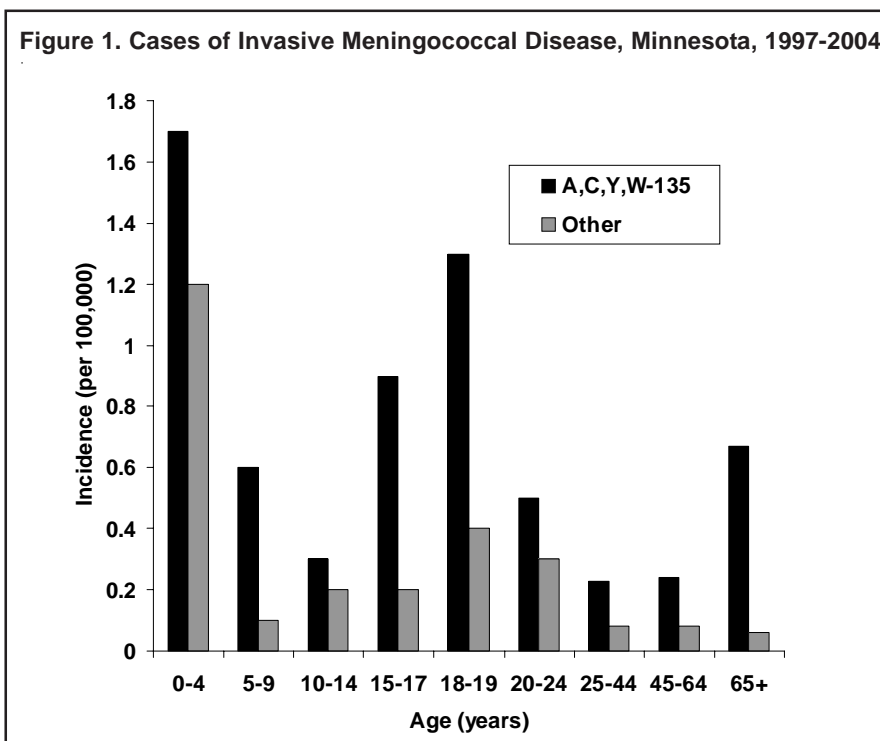
- 11- to 12-year-olds at the pre-adolescent visit;
- adolescents at high school entry; and
- college freshman living in dormitories.

ACIP recommendations also state that all other adolescents who wish to decrease their risk of meningococcal disease may elect to receive the vaccine. The American Academy of Pediatrics recommendations mirror the ACIP recommended groups.

## Vaccine Supply Shortage

While Sanofi's production schedule is on track, the demand for MCV4 has exceeded the supply available. In the interim, providers should prioritize the meningococcal conjugate vaccine to 11- to 12-year-olds and 15-year-olds so that if booster doses are necessary, the option is available. Since the potential need for providing a booster dose is limited in college freshmen living in dormitories, and if MCV4 supply is limited, they can receive MPSV4, which provides equivalent protection.

Figure 1. Cases of Invasive Meningococcal Disease, Minnesota, 1997-2004



# 11th Annual Emerging Infections in Clinical Practice and Emerging Health Threats Conference November 10-11 (half-day), 2005

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- Toll-like Receptors and Cytokines: Translation for the Clinician - Raymund Razonable
- Emerging Zoonoses - Marguerite Pappaioanou
- What's New in the Clinical Laboratory - Robin Patel
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The telephone numbers for infectious disease reporting

are 612-676-5414 until 10/30/05

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Toll-free 1-877-676-5414 will remain the same.

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