

Epidemiology and Disease Control Staff

Alina M. Alonso, MD
Assistant Director
Palm Beach County Health Department

Edwin Afamefuna, BS
Senior Human Services Program
Analyst

JoEllen Alvarez, RN, MPH
Nursing Program Specialist

Judith M. Cobb, RN, MSPH
Community Health Nursing Consultant

Vanessa P. Hightower
Staff Assistant/Coordinator

Barbara F. Johnson, RN, BSN
Senior Community Health Nursing
Supervisor

Diane King, RN, MSPH
Nursing Program Specialist

Savita Kumar, MD, MSPH
Medical Epidemiologist/Consultant

Shiela Lott
Staff Assistant

Shamilla Lutchman
Senior Clerk

Denise Pagán
Human Services Program Consultant

Ginger A. Stanley, BHS
Human Services Program Analyst

Anthony Stidham, MPH, DHSc©
Human Services Program Specialist

Holli Tietjen, MS
Human Services Program Consultant

Meningococcal Infection...

Separating Fact from Fiction

By Anthony Stidham, MPH, DHSc©

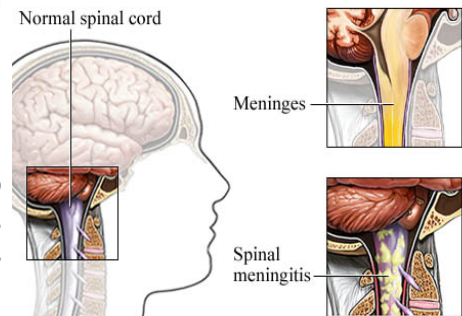


Meningococcal infection is the term used when an infection is caused by the bacterium *Neisseria meningitidis*. Although several types of infections may occur, the most common are meningitis (an infection of the covering of the brain and spinal cord) and septicemia (an infection of the blood).

This infection is commonly called spinal meningitis. Meningo-

cocchemia is another term used to refer to severely ill patients with septicemia. Meningococcal infection usually causes only a nose and throat infection but may also cause meningitis and sepsis that may be fatal. Asymptomatic colonization of the upper respiratory tract (a

"carrier") is frequent and provides the focus from which the organism is spread. The bacteria do not always cause disease in individuals. It is commonly carried in the throats of persons who are not ill. Approximately 5% to 10% of the general population carries the meningococcal bacteria in the nose and throat in a harmless state. This carrier state may last for days or months and seems to give those individuals, who harbor meningococcus in their upper respiratory tract, some protection from actually developing the disease state.



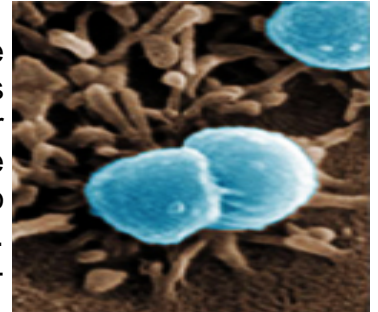
Since meningitis is difficult to recognize, understand and diagnose, it is imperative to differentiate whether the meningitis is viral or bacterial. Essentially, there are two major types of meningitis - viral (caused by a virus) and bacterial (caused by one of several types and strains of bacteria residing in the throat or nasal passages). The bacterial form of meningitis is particularly dangerous, fast-moving and has the most potential for being fatal. For many survivors, the long-term effects can be debilitating, possibly including multiple amputations, hearing loss, and kidney

damage. Many (but not all) forms of bacterial meningitis can be prevented by vaccination. Viral meningitis has similar symptoms to bacterial meningitis, but is neither as deadly nor as debilitating for the most part. According to the CDC, there is no specific treatment available for viral meningitis at this time. Most patients recover from viral meningitis on their own.

A common misconception is that meningococcal disease is extremely easy to transmit, but it is not. Very close, prolonged contact is required. However, once a person has it, meningococcal infection can be particularly dangerous for two reasons: (1) It is relatively rare. Therefore, we may not consider the possibility of contracting meningococcal infection and may ignore early symptoms and signs; and (2) It can be deceptive. A person may experience minor cold symptoms for a few days and then progress to severe meningococcal disease in a relatively short period of time.

Illness occurs suddenly with fever (as high as 105 degrees F), intense headache, nausea, and often vomiting. Neck stiffness and occasionally a blotchy or bruise-like rash may occur. If the patient is not treated, coma and death may follow.

Transmission is from person to person through droplets and discharge from the nose and throat of the infected persons, more often from carriers than cases. Meningococcal cases occur most often in children younger than 5 years of age. Adults more often are carriers. The period of time from exposure to the time when symptoms might occur ranges from one to ten days. Most commonly symptoms develop in less than four days. (Note: Viral meningitis is different and does not require treatment of exposed individuals.)



During epidemics of meningococcal meningitis, the carrier rate may approach 95%, yet less than 1% may develop the disease. This low occurrence of illness after exposure suggests that an individual's health status (the strength or weakness of the immune system), rather than bacterial factors, plays an important determining role in contracting the disease. The annual occurrence rate of meningococcal disease in the United States is stable at 1 to 3 per 100,000 (CDC, 2005). Average mortality rates vary between 2% and 10% with early recognition and treatment being the crucial variables.

The bacteria are found in discharges from the nose and throat of ill persons and non-ill carriers. The bacteria can spread to another person when intimate or very close personal contact occurs, such as kissing, sharing eating utensils, drinks, or cigarettes. It is very important to realize that most cases of disease occur after close contact with a carrier who is not ill and not as a result of exposure to someone with an infection.

Meningococcal bacteria cannot usually live for more than a few minutes outside the body. They are usually not transmitted in water supplies, swimming pools, or by routine contact in classrooms, dining rooms, bars, restrooms, etc., where an infected individual has been. Roommates, friends, and children, who are not directly exposed to an ill meningitis victim, are not at risk. Household members of a case are at the highest risk of developing infection following exposure. Still, the risk of developing infection after exposure is very low. Persons who have had intimate or direct exposure to a meningococcal meningitis patient within seven days are at risk for contracting meningococcal meningitis and should receive prophylactic medication. Intimate or direct exposure includes kissing, sharing eating utensils, or by droplet contamination from nose, throat, or any secretions or excretions from the body of the infected individual.

It has been found that the following populations are at increased risk for meningococcal disease: college freshmen living in dormitories; microbiologists who are routinely exposed to isolates of *N. meningitidis*; military recruits; persons who travel to or reside in countries in which *N. meningitidis* is hyperendemic or epidemic, particularly if contact with the local population will be prolonged; persons who have terminal complement component deficiencies; and persons who have anatomic or functional asplenia. Recommended vaccinations for these groups are noted in Table 6.

TABLE 6. Recommendations for the use of meningococcal vaccines among persons not vaccinated previously

Population group	Age group (yrs)				
	<2	2–10	11–19	20–55	>55
General population	Not recommended	Not recommended	A single dose of MCV4* is recommended at age 11–12 years (at preadolescent assessment visit) or at high school entry (at approximately age 15 years)	Not recommended	Not recommended
Groups at increased risk	Not usually recommended†	A single dose of MPSV4	A single dose of MCV4 is preferred (MPSV4 is an acceptable alternative)	A single dose of MCV4 is preferred (MPSV4 is an acceptable alternative)	A single dose of MPSV4
College freshmen living in dormitories					
Certain travelers§					
Certain microbiologists¶					
Certain populations experiencing outbreaks of meningococcal disease**					
Military recruits					
Persons with increased susceptibility††					

* Meningococcal conjugate vaccine.

† Meningococcal polysaccharide vaccine (MPSV4) (2 doses, 3 months apart) can be considered for children aged 3–18 months to elicit short-term protection against serogroup A disease (a single dose should be considered for children aged 19–23 months).

§ Persons who travel to or in areas where *Neisseria meningitidis* is hyperendemic or epidemic are at increased risk of exposure, particularly if contact with the local population will be prolonged. Vaccination is especially recommended to those visiting the "meningitis belt" of sub-Saharan Africa during the dry season (December–June), and vaccination is required by the government of Saudi Arabia for all travelers to Mecca during the annual Hajj. Advisories for travelers are available at <http://www.cdc.gov/travel/outbreaks.htm>, <http://www.cdc.gov/travel>, or by calling CDC's Travelers' Health Hotline at 877-FYI-TRIP (toll-free).

¶ Microbiologists who are routinely exposed to isolates of *N. meningitidis* should be vaccinated.

** The use of vaccination in outbreak settings has been described previously (Source: CDC. Control and prevention of meningococcal disease, and Control and prevention of serogroup C meningococcal disease: evaluation and management of suspected outbreaks: recommendations of the Advisory Committee on Immunization Practices [ACIP]. MMWR 1997;46 [No. RR-5]:13–21).

†† Includes persons who have terminal complement component deficiencies and persons with anatomic or functional asplenia.

The primary means for preventing sporadic meningococcal disease is antimicrobial chemoprophylaxis of close contacts of a patient with invasive meningococcal disease. (See Table 7.) Those individuals at increased risk may benefit from use of the antibiotics Rifampin or Ciprofloxacin. The medication kills the bacteria in the throat. The antibiotic will eliminate the bacteria in the throats of most persons, therefore decreasing their risk of infection.

TABLE 7. Schedule for administering chemoprophylaxis against meningococcal disease

Drug	Age group	Dosage	Duration and route of administration*
Rifampin†	Children aged <1 mo	5 mg/kg body weight every 12 hrs	2 days
	Children aged ≥1 mo	10 mg/kg body weight every 12 hrs	2 days
Ciprofloxacin§	Adults	600 mg every 12 hrs	2 days
	Adults	500 mg	Single dose
Ceftriaxone	Children aged <15 yrs	125 mg	Single IM [¶] dose
Ceftriaxone	Adults	250 mg	Single IM dose

* Oral administration unless indicated otherwise.

† Not recommended for pregnant women because it is teratogenic in laboratory animals. Because the reliability of oral contraceptives might be affected by rifampin therapy, consideration should be given to using alternative contraceptive measures while rifampin is being administered.

§ Not usually recommended for persons aged <18 years or for pregnant and lactating women because it causes cartilage damage in immature laboratory animals. Can be used for chemoprophylaxis of children when no acceptable alternative therapy is available. Recent literature review identified no reports of irreversible cartilage toxicity or age-associated adverse events among children and adolescents (Source: Burstein GR, Berman SM, Blumer JL, Moran JS. Ciprofloxacin for the treatment of uncomplicated gonorrhea infection in adolescents: does the benefit outweigh the risk? Clin Infect Dis 2002;35:S191–9).

¶ Intramuscular.

For persons diagnosed with meningitis, antibiotics given intravenously are the recommended treatment. If treatment is started promptly, the patient will generally recover without complication. However, delayed treatment can lead to neurological complications or death.

For travelers, antimicrobial chemoprophylaxis should be considered for any passenger who had direct contact with respiratory secretions from an index patient or for anyone seated directly next to an index patient on a prolonged flight (i.e., one lasting ≥8 hours). The attack rate for household contacts exposed to patients who have sporadic meningococcal disease was estimated to be four cases/1,000 persons exposed, which is 500–800 times greater than the rate for the total population. Because the rate of secondary disease for close contacts is highest immediately after onset of disease in the index patient, antimicrobial chemoprophylaxis should be administered as soon as possible (ideally <24 hours after identification of the index patient). Conversely, chemoprophylaxis administered >14 days after onset of illness in the index patient is probably of limited or no value. Oro-

pharyngeal or nasopharyngeal cultures are not helpful in determining the need for chemoprophylaxis and might unnecessarily delay institution of this preventive measure.

Meningitis can affect anyone in any age group, from the newborn to the elderly. Meningococcal disease is very serious, but there are ways to prevent the disease and eliminate the spread. When a case of meningococcal disease occurs, close contacts should be given chemoprophylaxis, preferably within 24 hours after the identification of the infection. The apprehension arising from a report of a case of meningococcal disease provides an opportunity for healthcare providers to promote community compliance with current recommendations.

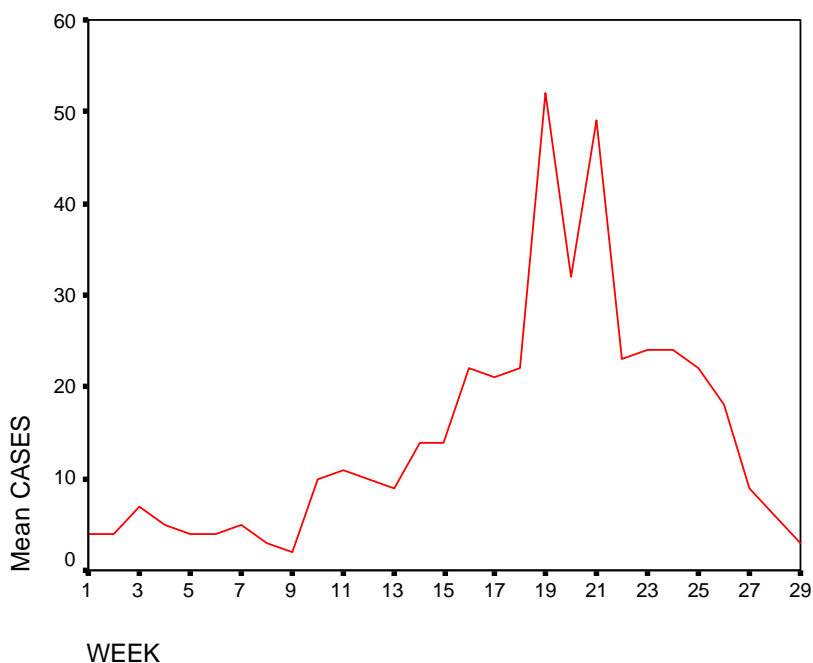
Centers for Disease Control and Prevention (2005). Prevention and Control of Meningococcal Disease. Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR 2008; 54: 1-21. Accessed and retrieved on May 1, 2008 from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5407a1.htm>

Influenza Activity Reported by Hospitals In Palm Beach County, Florida

By Pedro Oyuela, MD, MPH

One of the surveillance systems in Palm Beach County for influenza activity is the report of positive rapid antigen tests by local hospitals. During the first half of the 2007-2008 flu season 7 hospitals sent reports. The total number of positive tests for patients residing in zip codes that belong to Palm Beach County is 437. The peak of the activity so far was seen during weeks 19 (Feb. 3-9/08), 20 (Feb 10-16/08) and 21 (Feb 17-23/08).

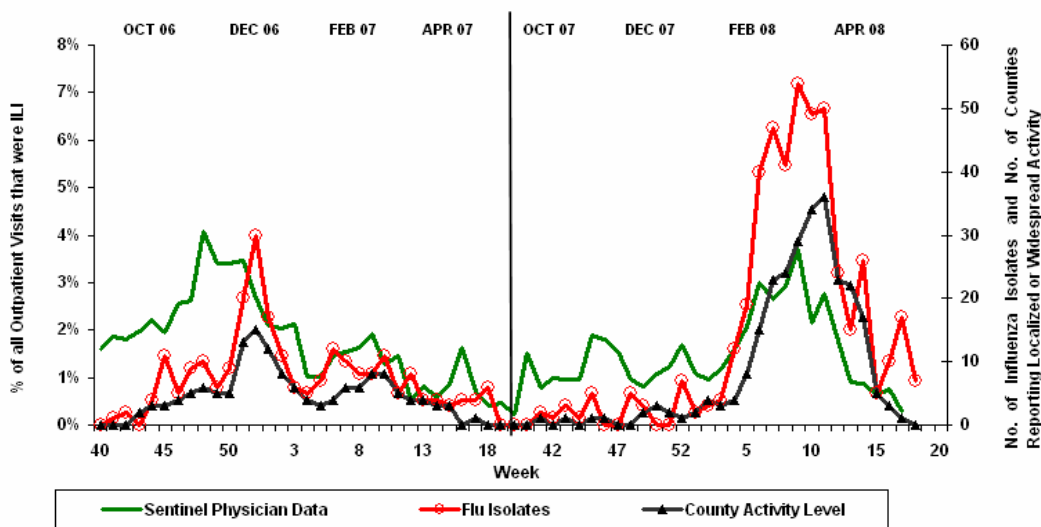
The following line graph shows the activity by week. The first week of reporting was Sep 30 to Oct 6/07. The last week before this report is 29 (April 27-May 3/08).



Number of cases of Influenza reported by hospitals by week

The county shows a similar pattern of activity compared to the state, as seen in the graph below, taken from the weekly State's Flu Report. The red line indicating flu isolates shows that the activity was at its peak during the month of February.

Florida influenza activity

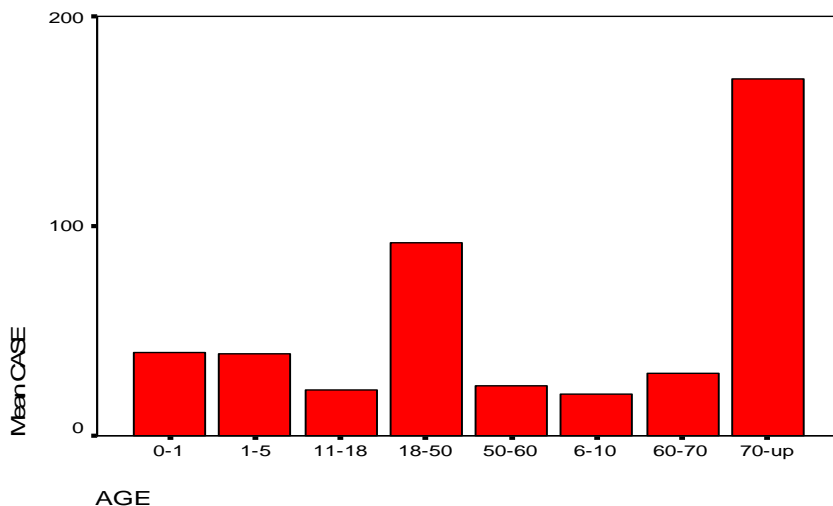


(From Florida Influenza Reports - Week ending April 26/2008)

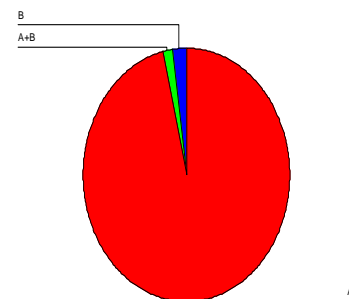
More than half of the reported cases occurred in patients over 50 years of age (n=224) and 28% in the younger groups, 0-18 years of age (n=124). 92 cases were in young adults. This is an expected demographic distribution for Influenza, as the youngest and the oldest continue to be the groups of major risk.

The following bar graph shows the age distribution using smaller groups. It is important to notice that the number of cases in children below age 1 is a third of the cases in the 0-18 group (n=40); similarly, the age group of 70 or older is responsible for more than 75% of the cases in the older population.

Number of cases reported by hospitals by age group



Finally, the vast majority of cases reported were from the A serotype (n=386). The following pie graph shows activity by serotype.



The Palm Beach County Health Department Epidemiology Program determines influenza activity using different surveillance systems, including reports of influenza like illness (ILI) in nursing homes; ILI reports by sentinel health care providers; positive laboratory results by hospitals; syndromic surveillance; and pneumonia and influenza mortality reports.



**PALM BEACH COUNTY HEALTH DEPARTMENT
2008 REPORTED COMMUNICABLE DISEASES
WEEK 27, 2008 (ENDING DATE 07/05/08)**

This Week This Year Same Time Last Year

CENTRAL NERVOUS SYSTEM AND INVASIVE DISEASES:

Haemophilus influenzae primary bacteremia	0	8	9
Haemophilus influenzae pneumonia	1	5	5
Meningococcal disease	1	3	0
Group B Streptococcus meningitis	0	0	1
Listeria monocytogenes meningitis	0	0	1
Listeriosis	0	4	2
Streptococcus pneumoniae meningitis	0	4	2
Streptococcus pneumoniae invasive disease, drug-resistant	1	25	14
Streptococcus pneumoniae invasive disease, susceptible	1	23	15
Streptococcal disease, invasive Group A	0	14	14
Bacterial meningitis, other	0	0	4
West Nile Virus, neuroinvasive	0	0	1
Creutzfeldt-Jakob Disease (CJD)	0	2	0

VACCINE PREVENTABLE DISEASES:

Congenital rubella syndrome	0	0	0
Rubella (German measles)	0	0	0
Rubeola (measles)	0	0	0
Mumps	0	1	0
Pertussis	0	3	9
Tetanus	0	0	0
Varicella	0	102	87
Vaccinia disease			

HEPATITIS:

Hepatitis A	1	6	5
Hepatitis B, acute	0	7	8
Hepatitis B, chronic	2	207	239
Hepatitis B (HBsAg+) in pregnant women	0	31	37
Hepatitis B, perinatal	0	0	0
Hepatitis C, acute	0	0	0
Hepatitis C, chronic	72	1784	586

ENTERIC DISEASES:

Giardiasis	4	50	32
Campylobacteriosis	1	45	39
Shigellosis	0	42	68
Salmonellosis	9	164	133
Cryptosporidiosis	0	19	9
Cyclosporiasis	0	9	6
Typhoid fever	0	0	1
Enterohemorrhagic E. coli (EHEC) O157:H7	0	2	2
E. coli shiga toxin + (serogroup non-O157)	0	0	2
E. coli shiga toxin + (not serogrouped)	0	3	3
Vibrio cholera 01	0	0	0
Vibrio cholera non-01	0	0	0
Vibrio fluvialis	0	0	0
Vibrio alginolyticus	0	1	0
Vibrio mimicus	0	0	0
Vibrio parahaemolyticus	0	0	1
Vibrio, other	0	0	0

OTHER DISEASES:

Human exposure to a potentially rabid animal	0	47	27
Animal rabies	0	1	1
Monkey bite	0	0	1
Brucellosis	0	0	0
Ciguatera	5	5	1
Dengue fever	0	2	1
Hansen's disease (Leprosy)	0	0	2
Lead poisoning	0	39	5
Legionellosis	0	12	3
Lyme disease	0	1	0
Malaria	0	2	1
Mercury poisoning	0	9	8