



# City Health Information

## VECTOR-BORNE AND ZONOTIC DISEASES IN NEW YORK CITY - AN UPDATE

During the spring and summer, clinicians in New York City need to be aware of tick and mosquito-borne diseases, and to ensure appropriate diagnostic testing and reporting of suspected cases. This issue of *City Health Information* provides an update on West Nile virus in New York City and guidance on diagnosing and reporting other vector-borne and zoonotic diseases, including possible exposure to rabies. From June through October, the peak adult mosquito season, physicians should be particularly alert for possible cases of West Nile encephalitis in New York City. To help the New York City Department of Health detect and respond to an outbreak of West Nile virus as quickly as possible, report immediately all suspected cases of viral encephalitis (*all ages*) and viral meningitis (*adults only*). The tick-borne diseases-babesiosis, ehrlichiosis and Lyme Disease may be acquired in areas close to New York City; Rocky Mountain Spotted Fever may be acquired within the city itself. For any patient with a suspected tick-borne or mosquito-borne illness, it is important to obtain a thorough travel history and appropriate diagnostic specimens. Patients who have laboratory evidence of tick-borne disease must be reported to the New York City Department of Health. Health care providers in New York City should also advise patients of the importance of taking measures to avoid mosquito and tick bites during the spring, summer and early autumn.

### West Nile Virus – An Update

Since its introduction to the western hemisphere in 1999, the West Nile virus has continued to cause human encephalitis and aseptic meningitis in New York City each summer and fall. In 1999, this mosquito-borne virus was responsible for 59 human cases requiring hospitalization in the New York City area, including seven deaths.<sup>1,2</sup> Over the past two mosquito seasons, there have been 46 cases of aseptic meningitis or encephalitis due to West Nile virus in the tri-state area (19 in 2000 and 27 in 2001). The epicenter in 1999 was northern Queens, and in 2000, Staten Island. In 2001, however, there was no clear epicenter in the region: nine human cases (including two mild cases not requiring hospitalization) occurred in New York City. Cases occurred in all boroughs except the Bronx. The incidence of confirmed and probable cases in the New York City area is summarized in *Figure 1*. The elderly continue to be at greatest risk for severe disease due to West Nile virus. The median age in 2001 of reported cases in the United States was 68 years (range 19-90). Since 1999, West Nile virus has spread dramatically within the United States. In 2001, the virus was demonstrated in 27 states, with 66 human infections occurring in 10 states and 737 infected horses and thousands of infected birds and mosquitoes found as far west as Arkansas and as far south as Florida.<sup>3</sup>

Now that West Nile virus has become enzootic and endemic in the eastern United States, health care providers, laboratorians and public health practitioners in New York City must continue to be vigilant. The unexpected appearance of West Nile virus in New York City in 1999 and the outbreak of intentional anthrax in the fall of 2001 illustrate our need for preparedness to respond to new and re-emerging infectious disease threats, and the critical importance of the partnership between the City's medical and public health communities. The New York City Department of Health has established a comprehensive arbovirus surveillance and control program which aims to reduce the population of mosquitoes capable of transmitting West Nile virus, identify the presence of the virus as early as possible in bird, animal and mosquito populations, and target control measures to reduce the possibility of human infections.

**During the peak adult mosquito season (June 1-October 31) it is critical that health care providers report immediately all suspected cases of encephalitis (*all ages*) and aseptic meningitis in adults (*age > 16 years*) to the New York City Department of Health.** (Aseptic meningitis in younger patients should continue to be reported routinely, but does not require immediate notification.) The Communicable Disease Program will assist you in making sure that your patient is tested appropriately. Please see *Figure 2* for instructions on how to identify and report suspected cases of West Nile virus.

During 2002 the Department of Health may need to control adult mosquitos by using synthetic pyrethroid pesticides (e.g., sumithrin). Pesticide use may result in eye, respiratory tract and/or skin irritation.<sup>4</sup> Physicians should immediately report any suspected pesticide-related illness to the New York City Poison Control Center (see *Figure 2*).

Further details will be provided by broadcast facsimile and e-mail to hospitals in the City at the beginning of the mosquito season and updates will be sent throughout the summer and fall. Additional information is also available on the NYCDOH website at [www.nyc.gov/health](http://www.nyc.gov/health).

#### West Nile References:

- Nash D, Mostashari F, Fine A, Miller J et al for the 1999 West Nile Outbreak Response Working Group. The Outbreak of West Nile Virus Infection in the New York City Area in 1999. *NEJM*. 2001; 344(24): 1807-14.
- Weiss D, Carr D, Kellachan J, Tan C et al for the West Nile Virus Outbreak Response Working Group. Clinical Findings of West Nile Virus Infection in Hospitalized Patients, New York, and New Jersey, 2000. *EID*. 2001; 4.
- Marfin A. WN virus surveillance results, 2001. Presentation at 3rd National West Nile Planning Meeting. CDC. March 22, 2002.
- NYCDOH, EIS statement <http://cityweb.nycnet/html/doh/html/wnv/eis.html>.

### Tick-borne Diseases In and Around New York City

The New York City Department of Health monitors tick-borne diseases, investigates reports to determine where exposure may have occurred, and conducts routine surveillance for ticks in New York City parks to determine the species of ticks that are found in the City. This information allows us to provide the public with advice regarding the risk of acquiring tick-borne disease and to target education regarding avoidance of tick bites.

Tick-borne diseases are common in the northeastern United States, and occur within New York City and in all surrounding areas. These diseases are treatable, and can be severe, making definitive diagnosis important. Tick-borne pathogens cause many more asymptomatic human infections than symptomatic cases, and many clinically ill patients present with non-specific signs including headache, myalgia and fever. As a result, diagnosing acute infection can be challenging and is further complicated by persistent antibody following subclinical infection, non-specific serologic responses, and cross-reactivity to similar, often non-pathogenic, microbes. Confirmation of infection often requires antibody testing on acute and convalescent serum samples, microscopy to visualize pathogens, or biopsy and immunologic staining for bacterial antigens. In many cases, patients affected with these diseases do not recall a tick bite. A history of tick bites is not necessary in order for these diseases to be included in the differential diagnosis for patients with clinically compatible illness (see *Table 1*). Physicians should be aware that patients with extensive tick exposure can be concurrently infected with more than one agent. Recommendations for preventing tick and mosquito bites are included in *Figure 3*.

#### Lyme Disease

Lyme disease is transmitted by the black-legged tick *Ixodes scapularis*. Black-legged ticks are present in significant numbers in counties surrounding New York City, and have been found, albeit rarely, in Bronx parks, including Ferry Point and Pelham Bay. The nymph of this tick, which is about the size of a sesame seed, is the stage most likely to bite humans: nymphs are found in the northeastern United States in spring and early summer. Adult black-legged ticks appear in the fall and winter, and occasionally bite people. Lyme disease transmission only occurs if a tick is attached for longer than 24 hours.

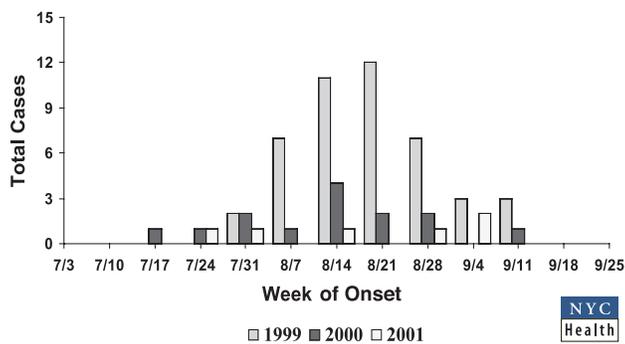
Over one thousand cases of Lyme disease have been reported among residents of New York City since 1996, with 213 cases reported in 2000 (the last year for which data are complete). The New York City Department of Health investigates cases of Lyme disease to determine where exposure may have occurred. Exposure history may only be assessed accurately for patients with erythema migrans (see *Table 1*), as this is the only clinical manifestation of Lyme disease known to occur within a fixed time (up to 30 days) following exposure. The vast majority of patients with erythema migrans report having traveled within the prior thirty days to areas outside of New York City that are known to have endemic Lyme disease (e.g., wooded parks in Westchester county or New Jersey.)

As the range of *Ixodes* ticks expands, however, New Yorkers may be at risk for Lyme disease after visiting areas not previously considered endemic. Local transmission of Lyme disease within New York City is also possible, especially in parts of the city (e.g., Queens and the north Bronx) contiguous with endemic areas, but has not been well-documented.

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Figure 1:

### New York City Human West Nile Virus Cases, 1999-2001 By Week of Onset



### Babesiosis

The protozoan parasite *Babesia microti* is also transmitted by the black-legged tick; its seasonal occurrence is similar to that of Lyme disease. Unlike Lyme disease, babesiosis has a highly focal geographic distribution. Endemic areas in the greater New York City region include Suffolk County (especially Fire Island and Shelter Island), the lower Hudson valley and portions of Connecticut and New Jersey. In 2000, there was a cluster of babesiosis in New York City residents who denied travel to known endemic areas. The only common travel history in these individuals was to northern Westchester County, an area not previously considered endemic for *B. microti*. In July 2001, a case of babesiosis occurred in a patient with no history of exposure outside of the Malba section of northern Queens (near the Whitestone Bridge). The geographic distribution of *B. microti* is expanding. Therefore, babesiosis should be considered in the differential diagnosis for patients with compatible illness and history of exposure to tick habitats.

### Ehrlichiosis

Two forms of ehrlichiosis occur in the greater New York area.

- Human granulocytic ehrlichiosis (HGE) is transmitted by the black legged tick and is caused by an agent similar to *Ehrlichia equi*, usually referred to as "the agent of HGE." HGE occurs in areas where black-legged ticks can be found (see section on Lyme disease above). The risk for acquiring HGE is highest in the spring and early summer, when these ticks are present. The prevalence of HGE in the northeast is much lower than that of Lyme disease (10 cases reported in New York City residents since 1996).
- Human monocytic ehrlichiosis (HME) is caused by *Ehrlichia chafeensis* and is transmitted by the lone star tick, *Amblyomma americanum*. Only adult lone star ticks feed on humans. These ticks appear throughout the spring, summer and fall, so exposure can occur beyond the season when HGE may occur. In New York State, most cases of HME occur in Westchester County, the lower Hudson Valley, and Long Island. The lone star tick is uncommon in New York City and has been found only rarely on Staten Island.

Both *Ehrlichia* species primarily affect leukocytes, (with predilection for granulocytes in the case of HGE or monocytes in the case of HME), and ehrlichial morulae can sometimes be found on a blood smear. Confirming a diagnosis of ehrlichiosis is difficult, and requires either paired serological samples taken 3-4 weeks apart, or a positive antibody titer in conjunction with morulae identified on blood smear (Table 1).

### Rocky Mountain Spotted Fever (RMSF)

*Rickettsia rickettsii* is the causative agent of RMSF, the only tick-borne disease known to be endemic to New York City. RMSF is transmitted by the American dog tick, *Dermacentor variabilis*, which is present in all five boroughs of the city, with greatest abundance in the Bronx. Only adult dog ticks feed on humans; these ticks appear throughout the spring, summer, and fall in New York City. An outbreak of RMSF occurred in 1996 primarily in the area of Soundview park in the Bronx; local trans-

Figure 2:

### How to Report Suspected Cases of West Nile Viral Disease and Arrange for Laboratory Testing

#### Immediate Reporting Is Requested From June 1 through October 31

1. **What to Report.** Hospitalized patients with any of the following clinical syndromes:
  - A) Viral encephalitis, a clinical diagnosis characterized by:
    - (1) Fever > 38°C or 100°F, and
    - (2) CNS involvement, including altered mental status (altered level of consciousness, confusion, agitation, or lethargy) or other cortical signs (cranial nerve palsies, paresis or paralysis, or convulsions), and
    - (3) An abnormal CSF profile suggesting a viral etiology (a negative bacterial stain and culture with a pleocytosis [WBC between 5 and 1500 cells/mm<sup>3</sup>] and/or an elevated protein level [ $> 40$  mg/dl])
  - B) Aseptic meningitis among persons aged 17 years and older
  - C) Guillain-Barré syndrome, especially with atypical features, such as fever, altered mental status, and/or pleocytosis

#### 2. How to Report

During business hours, call the Communicable Disease Program at 212-788-9830. At all other times, call the Poison Control Center at 212-POISONS (212-764-7667). Or, use the New York City Department of Health *Physician Initial Case and Laboratory Submission Report for Viral Encephalitis/Meningitis* form. (Beginning in June, we will send copies of this form in monthly West Nile virus updates via broadcast FAX and e-mail to hospital infection control, infectious disease, laboratory medicine, and emergency departments.) You can fax your report to us at 212-788-4268.

#### 3. How to Arrange Testing

Testing for West Nile viral infection at the New York City Public Health Laboratory is being prioritized for hospitalized patients with viral encephalitis, aseptic meningitis, or Guillain-Barré syndrome. When you call to report a suspected case, we will help determine whether testing is necessary, and, if it is, help your laboratory arrange it. Please call us to report the case and discuss the need for testing before directing your laboratory to submit specimens. CSF will be forwarded to the New York State Department of Health for additional PCR testing for other pathogens if the provider requests it. A letter of consent for PCR testing must be signed by the physician and submitted with the specimen. Commercial testing for West Nile virus is also available, and may be used for patients with milder illness. Please call the Communicable Disease Program at 212-788-9830 for further information.

#### 4. Which specimens to obtain

CSF: Two tubes (if possible) without preservatives, containing at least 1 cc each. Please instruct your laboratory to keep specimens frozen.  
Serum: 8-10 ml in a red-top or serum separator tube.

#### 5. Fatal encephalitis cases

Fatal viral encephalitis cases of unknown etiology must be reported to the Office of Chief Medical Examiner at 212-447-2030. Tissue samples, including brain, brainstem, and spinal cord, will be submitted to the New York State Department of Health and the Centers for Disease Control and Prevention for viral testing and immunohistochemical staining.

#### How to Report Suspected or Confirmed Pesticide Poisoning

Suspected or confirmed pesticide poisoning must be reported to the New York City Department of Health Poison Control Center. The Poison Control Center operates 24 hours a day and can be reached at 212-POISONS (212-764-7667) for medical consultation and reporting of pesticide-related illness. Confirmed or suspected cases of pesticide poisoning must also be reported to the New York State Department of Health, Pesticide Poisoning Registry (800-322-6850).

mission, however, has occurred in all five boroughs. From 1996 to 2002, 29 cases of RMSF have occurred in New York City residents, with most cases acquired in the City. The majority of cases occur May through September, although sporadic cases occur in other months. RMSF can be transmitted from tick to human in as little as 3-5 hours, so prompt removal after attachment is essential to preventing infection. Serologic diagnosis is complicated by antibody cross-reactivity to other spotted fever group rickettsiae, especially *Rickettsia akari*, the causative agent of rickettsialpox. Paired acute and convalescent serum samples are strongly recommended to confirm a diagnosis of RMSF.

#### Reporting Suspected or Confirmed Cases of Tick-Borne Disease

Report all suspected or confirmed cases of Lyme disease, babesiosis, ehrlichiosis and RMSF to the Communicable Disease Program. Suspect cases without a recent travel history should be reported as soon as possible so that we can target tick surveillance to identify potential new foci of transmission. Cases can be reported by telephone (212-788-9830 during normal business hours), or by mail (Communicable Disease Program, 125 Worth Street, CN-22A, New York, NY 10013) or facsimile transmission (212-788-4268) using the 395V/VDH 341, "Report of Communicable Disease" form.

#### Tick borne disease references.

1. Nadelman, RB and Wormser, GP. Lyme borreliosis. *Lancet*. 1998. 352:557-565
2. Centers for Disease Control and Prevention. Case definitions for infectious conditions under public health surveillance. *MMWR*. 1997. 46(RR-10).
3. Daniels, TJ and Falco, RC. Assessing risk for tick-borne diseases in New York City, 1999. Final Report to the New York City Department of Health, July 2000.
4. Smith, G, Wileto, EP, Hopkins, RB, Cherry, BC, Maher, JP Risk factors for Lyme disease in Chester county, Pennsylvania. *Public Health Reports*. 2001. 116: 146-156.

**Table 1 – Clinical characteristics of tick-borne diseases occurring in the Greater New York City area**

Disease	Common clinical manifestations	Incubation	Diagnostic Aids
Babesiosis	Fever, chills, myalgia, fatigue, hemolytic anemia +/- jaundice	1-4 weeks <sup>1</sup>	Blood smear (intra-erythrocytic ring forms <sup>2</sup> ), serology (IFA - ideally paired samples), PCR available at CDC
Ehrlichiosis	Fever, headache, myalgia, +/- anorexia, nausea, vomiting, leukopenia, thrombocytopenia	5-10 days	Blood smear (intracytoplasmic morulae in leukocytes), serology (ELISA, IFA), PCR
Lyme Disease	<b>Early:</b> Erythema migrans (single or multiple, $\geq 5$ cm diameter, often with an area of central clearing), fever, myalgia <b>Late:</b> Arthritis affecting one or more joints, aseptic meningitis, cranial neuritis (including Bell's Palsy), radiculoneuritis, cardiac abnormalities (AV block)	EM: 3-30 days (mean 7-10)  Later signs: weeks to months	EM is pathognomonic Serology (ELISA or IFA followed by confirmatory Western Blot), Neuroborreliosis: CSF antibody titer greater than serum titer
Rocky Mountain Spotted Fever	Fever, headache, myalgia, rash (maculopapular or petechial <sup>3</sup> often widespread involving palms and soles), thrombocytopenia	3-14 days	Serology (IFA - ideally paired samples <sup>4</sup> ) Immunohistochemistry of biopsy of affected skin

1. Asymptomatic infection may recrudescence as clinical illness months to a year after exposure.

2. *B. microti* ring forms in erythrocytes can be confused with *Plasmodium falciparum*. Positive or suspicious blood smears can be sent to the New York City Department of Health. Laboratory for confirmation of a diagnosis of either malaria or babesiosis.

3. Maculopapular rash may appear 3-5 days post exposure followed by petechial rash beginning day 5 or 6 post exposure.

4. Onset of symptoms often precedes seroconversion. Serologic samples collected early in infection (i.e., within the first 2-4 weeks following symptom onset) may be negative.

## Figure 3

### PREVENTION OF MOSQUITO AND TICK BITES

#### Mosquito Bite Prevention

- If outside from dusk to dawn when mosquitoes are most active, people should wear long pants, loose-fitting, long-sleeved shirts, and socks, and consider the use of an insect repellent containing DEET (n, n-diethyl-m-toluamide).\*
- Make sure that doors and windows have tight-fitting screens. Repair or replace all screens that have tears or holes.
- Eliminate standing water from your property.
  - Remove all discarded tires from your property.
  - Dispose of tin cans, plastic containers, ceramic pots, or similar water-holding containers.
  - Make sure roof gutters drain properly. Clean clogged gutters in the spring and fall.
  - Clean and chlorinate swimming pools, outdoor saunas and hot tubs. If not in use, keep empty and covered.
  - Drain water from pool covers.
  - Change the water in bird baths every 3 to 4 days.
  - Turn over wheelbarrows and plastic wading pools when not in use.
  - Remind or help neighbors to eliminate breeding sites on their properties.

#### Tick Bite Prevention

- The best and most effective means of tick bite prevention is to perform a thorough tick check after returning from the field and remove any ticks you find. Remember that nymphal ticks are very small (see below) so may be missed on visual inspection. Manually inspect your head and other haired skin, and use a mirror or ask someone else to inspect where you can't easily see or reach.
- It is especially important to check for ticks on children, who may not be able to check themselves thoroughly.
- Wear light-colored clothing to allow you to see ticks that are crawling on your clothing.
- Tuck your pants legs into your socks so that ticks cannot crawl up the inside of your pants legs.
- Apply repellents to discourage tick attachment. Repellents containing permethrin can be sprayed on boots and clothing, and will be effective for 2 weeks or more if the clothing is not laundered. Products containing permethrin are for use on clothing only- not on skin. Products containing repellents with DEET can be applied to the skin, but will last only a few hours before reapplication is necessary.\*

\*Use DEET with caution on children. Toxic encephalopathic reactions have occurred in rare instances following dermal application where extensive applications of products containing high concentrations of DEET were used (contrary to label instructions). The American Academy of Pediatrics (AAP) reports that no definitive studies exist in the scientific literature about applications of safe DEET concentrations for children. The AAP recommends a cautious approach, using products containing 10% DEET or less for children.

#### Rabies

Rabies continues to affect wildlife in and around New York City, posing a risk of transmission to people and pets, and requiring that physicians consider the need for rabies prophylaxis for patients with animal bites (see Figure 4). In 2001, a total of 38 rabid animals were found in New York City. The majority of these were found in the Bronx (27 raccoons, 4 skunks). Four rabid bats were identified in Manhattan (1), Queens (2) and Staten Island (1). In addition, a rabid stray cat was found in a Brooklyn subway tunnel. In 2002 thus far, 8 raccoons and 2 skunks in the Bronx have had laboratory confirmed rabies. While most cases of rabies in New York City have occurred in terrestrial mammals, exposure to bats continues to account for almost all human cases of rabies in the United States, including a case in California in March 2002 due to a Mexican free-tailed bat variant.

It is important to evaluate animal bite victims for the need for rabies prophylaxis. It is also important to evaluate patients for prophylaxis if a bat is found in a room with a sleeping person even in the absence of an obvious bite wound. Figure 4 summarizes New York City and State recommendations for prophylaxis. If there is any doubt about whether prophylaxis is recommended, the New York City Department of Health is available for consultation by calling 212-788-9830 during regular business hours or the New York City Poison Control Center at 212-POISONS (212-764-7667) at all other times.

Figure 4

EVALUATING ANIMAL-RELATED INJURIES FOR RABIES PROPHYLAXIS

Note: All bites should be reported to the New York City Department of Health using the bite report form provided by Veterinary Public Health Services or by calling the Animal Bite Unit at 212-676-BITE (2483)

- **Bat, Raccoon, Skunk or Fox:** If patient is bitten or scratched by a bat, raccoon, skunk or fox, or if the patient was asleep in a room at the time a bat is found (alive or dead), and the animal is:
  - unavailable for rabies testing → patient should begin PEP immediately.
  - available for testing → contact the NYCDOH Animal Bite Unit to arrange for testing. PEP can be delayed until test results are available
- **Other Bat Exposure:** If patient has had other close contact with a bat (skin contact even if bite not observed, or bat seen near a child or someone mentally impaired), contact NYCDOH for consultation on the need for prophylaxis.
- **Dog, Cat, Ferret or Livestock:** If patient is bitten by a dog, cat, ferret, or domestic livestock, and the animal is
  - a stray, or owner is unknown and animal is unavailable for 10-day follow up → patient should begin PEP immediately
  - owned, and the owner is known; or animal is available for 10-day follow-up (e.g., at a shelter): → the animal may be observed for 10 days following the bite. If the animal is healthy after 10 days, the bite victim was not exposed to rabies; there is no need for post exposure prophylaxis.
  - sick or dead and is available for rabies testing → contact the NYCDOH Animal Bite Unit (212-676-BITE, -2483) to arrange for testing. Contact the Communicable Disease Program to determine if PEP can be delayed until test results are available.
  - sick or dead and cannot be tested → patient should begin PEP immediately.
- **Small Rodent:** If a patient is bitten by a small rodent (e.g., mouse, rat, squirrel, guinea pig, gerbil, hamster) PEP is not indicated.

For bites or scratches by other mammals (e.g., rabbits, woodchucks), or for other information please call the New York City Department of Health.

DURING BUSINESS HOURS:

- To report animal bites call the Animal Bite Unit: 212-676-BITE (2483)
- For consultation on rabies PEP call the Communicable Disease Program: 212-788-9830

NIGHTS OR WEEKENDS:

For both PEP consultation and bite reporting call: 212-POISONS (212-764-7667)

Resources: The New York City Department of Health [www.nyc.gov/health](http://www.nyc.gov/health)

Reporting  
 Communicable Disease Program .....(212) 788-9830  
 Fax (212) 788-4268  
*Business hours (Monday-Friday, 9AM to 5PM)*  
 To immediately report suspected cases of viral encephalitis, for medical consultation, for information about serologic testing for arboviruses, and to obtain copies of the *Physician Initial Case and Laboratory Submission Report for Viral Encephalitis/Meningitis*.

The New York City  
 Poison Control Center .....(212)-POISONS (212-764-7667)  
 Available 24-hours-a-day during non-business hours.  
 Office of Chief Medical Examiner .....(212) 447-2030  
 To immediately report fatal cases of viral encephalitis of unknown etiology.  
 Public Health Laboratories  
 (Immunology Laboratory).....(212) 447-6220 (212) 447-6451  
 For information about serologic testing for arboviruses, including West Nile, St. Louis encephalitis, as well as dengue.

Other Information  
 Automated West Nile Virus  
 Information Line.....(877) WNV-4NYC  
 or (877) 968-4692  
 TTY(business hours) (212) 442-7772  
 Up-to-date information on the city's campaign to combat West Nile virus, including eliminating mosquito breeding sites, taking personal protective measures to prevent mosquito bites, reporting dead bird sightings and standing water.

The New York State Department of Health  
 Wadsworth Center Laboratory.....(518) 869-4557 [www.wadsworth.org](http://www.wadsworth.org)  
 For information on laboratory testing for arboviral and non-arboviral causes of viral encephalitis.

Other Resources  
 Centers for Disease Control and Prevention Revised guidelines for surveillance, prevention and control of West Nile virus infection—United States, 2001. Available at: [http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines\\_apr-2001.pdf](http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines_apr-2001.pdf)  
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