CME/CNE Activity

This issue of *City Health Information,* including the continuing education activity, can be downloaded (but not for electronic response) in the publications section at nyc.gov/health.

Instructions

1. Read this issue of *City Health Information* for the correct answers to questions.
2. Complete all information on the response card, including your name, degree, mailing address, telephone number, and E-mail address.

   PLEASE WRITE CLEARLY.

3. Select your answers to the questions, and check the corresponding boxes on the response card provided. **To receive continuing education credit, you must answer four of the first five questions correctly.**
4. Return the response card or a photocopy of the card postmarked no later than May 31, 2003. Mail to CME/CNE Administrator NYC Department of Health and Mental Hygiene 161 William Street, 5th floor, CN-29C New York, NY 10038.

CME/CNE Activity Judicious Use of Antimcrobials

1. Which one of the following statements is FALSE?

- ❑ **A.** Steps that physicians can take to preserve antibiotic effectiveness include using an agent that will target the likely pathogen and adjusting treatment based on susceptibility test results.
- ❑ **B.** The most important risk factor for carriage of or infection with antibiotic-resistant *Streptococcus pneumoniae* is underlying chronic disease.
- ❑ **C.** Guidelines have recently been published on appropriate antimicrobial use for the management of upper respiratory tract infections in children and adults.
- ❑ **D.** Evidence indicates that antibiotic treatments for children have declined from 1989 through 2000.
- ❑ **E.** Empiric therapy for pneumococcal meningitis in New York City should include vancomycin.

2. Which one of the following statements regarding pneumococcal vaccines is FALSE?

- ❑ **A.** The 7-valent conjugate vaccine (PCV7) is effective against those serotypes of pneumococcus that are responsible for over 80% of all invasive pneumococcal disease in children.
- ❑ **B.** Individuals of all ages at high risk for pneumococcal disease should receive both the conjugate (PCV7) and polysaccharide (PPV23) vaccines.
- ❑ **C.** The pneumococcal conjugate vaccine PCV7 reduces nasopharyngeal carriage of pneumococcus.
- ❑ **D.** Black and Hispanic persons ≥ 65 years of age report receiving the pneumococcal vaccine much less often than do white persons ≥ 65 years of age in New York City.

3. Which one of the following statements regarding acute otitis media (AOM) and the observation option is FALSE?

- ❑ **A.** The observation option is recommended for children under 2 years of age with a certain AOM diagnosis.
- ❑ **B.** In some instances, parents of a child with AOM can be given an antibiotic prescription with the instruction that they fill it only if their child's symptoms persist or worsen.
- ❑ **C.** Use of additional antibiotics will not hasten the resolution of asymptomatic middle ear effusion.
- ❑ **D.** Because of the difficulty in detecting middle ear effusion, some degree of uncertainty often exists when diagnosing AOM.

4. The decrease in new cases of multi-drug-resistant tuberculosis (MDRTB) in New York City has primarily been due to which one of the following?

- ❑ **A.** Decreased immigration from countries with high rates of tuberculosis
- ❑ **B.** The availability of new, more powerful drugs for the treatment of tuberculosis
- ❑ **C.** Implementation of good public health practices including the use of directly observed therapy (DOT)
- ❑ **D.** The decrease in new HIV infections, which fuels the development of MDRTB

5. Which of the following should be considered in a patient with persistent signs or symptoms of infection following appropriate STD treatment?

- ❑ **A.** Inadequate dosing due to less than optimal medication adherence by the patient
- ❑ **B.** Re-infection resulting from exposure to a new infected partner or an ongoing partner who remained untreated
- ❑ **C.** Drug resistance to the chosen pharmacological agent
- ❑ **D.** All of the above

6. How well did this Continuing Education activity achieve its educational objectives?

❑ **A.** Very well ❑ **B.** Adequately ❑ **C.** Poorly

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City Health Information

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Summary of Reportable Diseases and Conditions 2000 and 2001

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A Message from the Commissioner

At the beginning of the antibiotic era, many medical professionals believed that infectious diseases would soon be a thing of the past. But this year's Summary of Reportable Diseases and Conditions *City Health Information*, with its focus on drug resistance, reminds us that there is still much work to be done.

Overuse of antimicrobials during the past 50 years has created increasingly resistant organisms. Unless we take decisive action to control resistant bacterial and viral strains, we may well be ushering in a "post-antibiotic" age for some pathogens.

The greatest current threats of drug resistance include:

- **Pneumococcus.** Increasingly resistant strains of *Streptococcus pneumoniae* threaten to make common ear and respiratory infections, as well as pneumonia and meningitis, progressively more difficult to cure.
- **Staphylococcus.** The recent emergence of a *Staphylococcus aureus* strain that was fully resistant to vancomycin reminds us of the need to use vancomycin judiciously in the hospital setting and to ensure adherence to infection control guidelines for hospitalized patients with resistant pathogens, in order to prevent nosocomial spread.
- **Tuberculosis.** A decade ago, multidrug-resistant tuberculosis (MDRTB) spread rapidly in New York City. Effective, standardized, directly observed treatment stopped the outbreak of MDRTB; continued application of these principles is essential to prevent another resurgence.
- **Enterococcus.** Enterococci are becoming increasingly resistant to antibiotics.
- **HIV.** Because 74% of patients report serious adverse effects from current multidrug therapies, and because long-term benefits depend on long-term, high-level adherence, we must guard against the development of multidrug-resistant strains of HIV.

Doctors and other health care professionals can help prevent and control drug resistance. Avoiding the unnecessary use of antimicrobials, adhering to standard drug treatment regimens, encouraging those on treatment to maintain their course of drug therapy, and monitoring patient progress and community trends will all be critically important in maintaining the effectiveness of drug therapies. Educating our patients that inappropriate use of antibiotics can be harmful is key to success.

Working together, we can make certain that many of the public health problems of the past remain problems of the past, and that we have the pharmacotherapeutic tools we need to fight the new infectious diseases we will surely face in the future.

Thomas R. Frieden, MD, MPH
Commissioner of Health and Mental Hygiene

HIPAA and Its Impact on Public Health

Roslyn Windholz, Deputy General Counsel NYC DOHMH

Enacted in 1996, HIPAA (the Health Insurance Portability and Accountability Act) required the promulgation of regulations relating to the privacy, security and transmission of individually identifiable patient health information. HIPAA and its implementing regulations apply to "covered entities." A covered entity under HIPAA is a health plan, a health care clearinghouse, or a health care provider who conducts certain financial and administrative transactions electronically (for example, billing and enrollment).

On August 14, 2002, the federal Department of Health and Human Services (HHS) published final modifications to HIPAA's Privacy Regulations. Most entities covered by the HIPAA's Privacy Regulations must comply by April 14, 2003.

What effect do the Privacy Regulations have on the New York City Department of Health and Mental Hygiene (NYC DOHMH) as a covered entity? To the extent parts of the agency are "covered," those parts of the agency must comply with the Privacy Regulations. For example, covered entities must provide a patient with notice of the patient's privacy rights and the privacy practices of the covered entity. A provider rendering direct treatment to a patient must make a good faith effort to obtain the patient's written acknowledgment of the notice of privacy rights and practices.

As a result of the recent modifications, providers are not required, as was initially proposed, to obtain a patient's consent prior to the use and/or disclosure of patient health information for the purpose of **treatment, payment** and **health care operations.** It is important to understand, however, that the Privacy Regulations establish a federal floor of safeguards to protect the confidentiality of medical information. State laws which provide more stringent privacy protections continue to apply. Consequently, to the extent New York State (NYS) law requires a patient's consent prior to a provider disclosing information to another provider, patient consent continues to be required, irrespective of HIPAA.

What effect does HIPAA have on a provider's responsibility to report to the health officer or to cooperate with the Department in the Department's surveillance activities and/or epidemiological investigations? It is important to understand that HIPAA does not impede any of these activities. There are two specific provisions in the Privacy Regulations which authorize such public health activities without obtaining the patient's permission. The Privacy Regulations authorize disclosure when disclosure is required by law (in this regard, the New York City [NYC] Health Code and the NYS Sanitary Code, in effect in NYC, set forth diseases and conditions which must be reported to the NYC DOHMH). In addition, the Privacy Regulations specifically authorize disclosure to a public health authority "authorized by law to collect or receive such information for the purpose of preventing or controlling disease... including, but not limited to, the reporting of disease... and the conduct of public health surveillance, public health investigations, and public health interventions..." (again, the NYC Health Code and NYS Sanitary Code, are relevant provisions of law).

Finally, it is worth pointing out that the Federal Office for Civil Rights, the agency charged with enforcing the HIPAA Privacy Regulations, has issued guidance making it very clear that a health care provider or other covered entity does not need to obtain patient permission prior to notifying the public health authority of a reportable disease.

This Issue

Physicians are critical to efforts to preserve one of the 20th Century's greatest therapeutic advances: life-saving antimicrobials. The emergence of antibiotic resistance undermines our efforts to protect the health of our patients and the public. This issue of the New York City Department of Health and Mental Hygiene *Summary of Reportable Diseases and Conditions, 2000 and 2001* explores methods by which public health agencies and the medical community can work together to contain antimicrobial resistance.

Reasons for the emergence of antimicrobial resistance include inappropriate use of antibiotics in outpatient and hospital settings, increased numbers of immunocompromised patients, poor infection control practices, and increased use of invasive devices and procedures.[1] Extensive use of antibiotics in agriculture, fisheries, and animal husbandry also contributes to antimicrobial resistance.[1] A comprehensive strategy to curtail antimicrobial resistance includes rational antibiotic use in medicine and other fields, education for patients as well as health care providers, heightened surveillance, improved use of vaccines, and strict adherence to infection control policies.[2,3] Such a strategy should also include basic and applied research in microbial pathogenesis, vaccine and drug development, and diagnostics.[2,3]

The National Ambulatory Medical Care Survey recently documented decreases between 1989 and 2000 in antimicrobial prescription rates by office-based physicians for children and adolescents.[4] This decline coincided with efforts of the Centers for Disease Control and Prevention (CDC) and other professional organizations to educate health care providers and patients on appropriate antimicrobial use. Despite these encouraging trends, however, pneumococcal antibiotic resistance increased in the1990s,[5] underscoring the need for a comprehensive strategy that includes continued promotion of appropriate antimicrobial prescription practices in all sectors of the medical community.

In this issue, providers are called upon to help contain antimicrobial resistance in outpatient settings through judicious antimicrobial use. There is a need for hospital and medical care practices to monitor the antibiotic prescribing behavior of their health care providers and provide feedback and educational information. Judicious antibiotic use requires that providers only prescribe antibiotics when needed, use an appropriate (narrow spectrum) antibiotic based on susceptibility results when available, and ensure that the patient complies with the prescribed dose and duration of treatment.[6] Provider decisions regarding the selection of medications for empiric therapy and ordering of susceptibility tests should be based on the patient's clinical findings and laboratory test results with consideration of current clinical practice guidelines that are evidence-based.

It should be noted that in August 2000, the New York City Department of Health mandated the reporting of all invasive pneumococcal infections by laboratories. This requirement allows us to more accurately track the proportion of pneumococcal infections that are drug resistant. It is particularly important to monitor patterns of resistance in *Streptococcus pneumoniae*, as this pathogen is the leading cause of community-acquired bacterial pneumonia, bacterial meningitis, bacterial sinusitis and otitis media in the United States.

Patient demands can lead to over-prescription of antimicrobials by physicians. Physicians and other health care providers need to advocate for responsible advertising of antibiotics by the pharmaceutical industry and to effectively educate patients to better understand that unnecessary treatment is harmful and that finishing prescribed courses of therapy is important. A survey conducted in November 2001 documented public confusion regarding the appropriate use of antibiotics: while most respondents realized that viruses cause upper respiratory infections and antibiotics are ineffective in treating viruses, 49% believed that antibiotics were helpful in the treatment of colds and influenza.[7,8] Information on tools useful in educating patients in busy office-based practices is presented in this Summary.

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Penicillin-Resistant *Streptococcus pneumoniae* in New York City

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NYC DOHMH

Streptococcus pneumoniae (*S. pneumoniae*) is the leading cause of community-acquired bacterial pneumonia, bacterial meningitis, bacterial sinusitis, and otitis media in the United States. *S. pneumoniae* strains resistant either to penicillin alone or to multiple drugs, including quinolones, have emerged in the United States since the early 1990s. Since resistance rates show marked regional variation, it is recommended that public health authorities track local resistance rates to guide providers' decisions for empirically treating suspected pneumococcal infections, while awaiting susceptibility results.[1] Since 1995, the year the New York City Department of Health (NYC DOH) began surveillance of penicillin-resistant *S. pneumoniae*, the prevalence of penicillin-resistant *S. pneumoniae* invasive infections in New York City (NYC) has increased each year. In August 2000, the NYC DOH reporting requirements were broadened to include ***all*** invasive pneumococcal infections, regardless of antibiotic susceptibility patterns. The New York City Department of Health and Mental Hygiene (NYC DOHMH) regularly provides clinicians and laboratory staff information on local population-based surveillance data and trends in antibiotic resistance to guide empiric therapy of suspected pneumococcal infections. This article of *City Health Information* contains recent *S. pneumoniae* drug resistance surveillance data as well as recommendations for preventing S. *pneumoniae* resistance and treating pneumococcal meningitis, pneumonia, and sepsis. Recommendations regarding the treatment of otitis media are presented in the article "Judicious Use of Antibiotics when Treating Acute Otitis Media in Children and the Observation Option" (Page 6).

2001 New York City Surveillance Data

Laboratories at acute care hospitals and long-term care facilities report to the NYC DOHMH the number of invasive *S. pneumoniae* isolates and drug-resistant *S. pneumoniae* isolates they have identified. **The NYC DOHMH uses the National Committee for Clinical Laboratory Standards (NCCLS) guidelines to define resistance; isolates are considered resistant to penicillin only if confirmed by Minimum Inhibitory Concentration (MIC) testing.**[2] According to NCCLS guidelines, intermediate-level penicillin resistance is defined as an MIC 0.12–1.0 µg/ml; high-level penicillin resistance is defined as an MIC ≥ 2.0 µg/ml. In 2001, 30% of *S. pneumoniae* blood culture isolates in NYC were either intermediately or highly resistant to penicillin. This is an increase from 2000, when 26% of NYC *S. pneumoniae* blood culture isolates overall were found to be penicillin resistant (Figure 1). The proportion of *S. pneumoniae* blood culture isolates in NYC highly resistant to penicillin in 2001 was 10%. Data from 2001, however, may not be strictly comparable to those from previous years because of the August 2000 change in reporting requirements.

S. pneumoniae resistance data for NYC are similar to national data. National drug resistance rates are estimated by the Centers for Disease Control and Prevention (CDC) Emerging Infections Program Network by analyzing data from eight states (a study population > 19 million). As reported by the CDC in the Active Bacterial Core Surveillance Report in 2000, the national prevalence of *S. pneumoniae* with intermediate-level or high-level penicillin resistance was estimated to be 28% and the national prevalence of high-level penicillin resistance was estimated to be 18%.[3]

Multidrug and Quinolone Resistance

Although rare in the United States, multidrug-resistant *S. pneumoniae* (MDRSP), defined as *S. pneumoniae* resistant to two or more drugs, and quinolone-resistant *S. pneumoniae* (QRSP), threaten to complicate the future management of pneumococcal infections.[4-6] In 2001, the proportion of NYC *S. pneumoniae* blood isolates with intermediate-level or high-level penicillin resistance that were also resistant to extended spectrum cephalosporins was 8%. In 1999, there was an outbreak of MDRSP at a long-term care facility in NYC, which was jointly investigated by the NYC DOH and the CDC. The *S. pneumoniae* strain responsible for the outbreak was resistant to nearly all antibiotics, including quinolones (levofloxacin, ofloxacin) and was susceptible only to vancomycin. A subsequent survey assessed the prevalence of QRSP in NYC and identified only sporadic cases at acute and long-term care facilities. In a separate study, published in 2002, 3.6% of 138 invasive *S. pneumoniae* isolates from western Brooklyn (1997-99) were resistant to levofloxacin.[7] The extent of QRSP is unclear, as many clinical laboratories do not routinely test for it. To improve monitoring of NYC QRSP trends, the NYC DOH began collecting more comprehensive QRSP data in 2001. Present data suggest that NYC QRSP continues to occur sporadically; only four (1.7%) of 239 *S. pneumoniae* isolates reported to the NYC DOH in 2001 as having undergone quinolone resistance testing were identified as QRSP.

All invasive pneumococcal strains should undergo microbiology laboratory testing for susceptibility to penicillin, an extended-spectrum cephalosporin, and vancomycin. As QRSP becomes more prevalent in NYC, clinical laboratories should consider routine susceptibility testing of quinolones for pneumococcal isolates from sterile sites (with the exception of cerebrospinal fluid [CSF]). Quinolone susceptibility testing is particularly important for patients who are currently being treated with or have recently been treated with these medications.

Implications for Empiric Therapy for Suspected Pneumococcal Infections

When making decisions regarding empiric antibiotic therapy for patients with suspected pneumococcal disease, especially pneumococcal meningitis, physicians need to consider that the responsible strain may be drug resistant. Once susceptibility results are available from the laboratory, if possible, the treatment regimen should be modified to a narrow spectrum antibiotic. When choosing antibiotic therapy, providers need to consider not only the MIC of the isolate and the NCCLS susceptibility classification, but the site of infection as well; this is because antibiotic penetration, achievable concentrations, and bactericidal activity may vary depending on the site. Although drug-resistant *S. pneumoniae* strains are not more virulent than drug-sensitive strains, increased morbidity, mortality, and unnecessary hospitalizations can result if effective treatment is delayed.[8-10] This is especially important in the treatment of pneumococcal meningitis.

General Empiric and Targeted Antibiotic Therapy Guidelines for the Treatment of Suspected Pneumococcal Meningitis and Pneumonia in Adults

For detailed treatment guidelines, see references 11–14.

Pneumococcal Meningitis

- In areas with a high prevalence of resistant *S. pneumoniae*, such as NYC, empiric therapy for suspected pneumococcal meningitis should generally include an extended-spectrum

cephalosporin (e.g., cefotaxime or ceftriaxone) and vancomycin.[15,16] Once susceptibility tests are available, therapy should be adjusted accordingly.[11,15]

- For CSF isolates susceptible to penicillin (MIC ≤ 0.06 µg/ml), either penicillin or the extended spectrum cephalosporin can be continued alone; if the penicillin MIC is ≥ 0.12, both vancomycin and the cephalosporin should be continued. If the cephalosporin (i.e., cefotaxime or ceftriaxone) MIC is < 0.5, however, some experts consider dual therapy with vancomycin to be unnecessary.[15,16]

- To evaluate the effectiveness of the therapy, a second lumbar puncture may be considered, especially for patients who are not responding clinically, or who have ß-lactamase-resistant *S. pneumonia*.[16]

Adult Pneumococcal Pneumonia or Sepsis

As *S. pneumoniae* is the most common cause of community-acquired pneumonia, empiric therapy must adequately cover penicillin-resistant strains.

Empiric Therapy

- For adult outpatients, although guidelines differ,[10-14] recommended therapies should always include at least one of the following: a macrolide, doxycycline or an anti-pneumococcal quinolone (gatifloxacin, levofloxacin, moxifloxacin).

- For adult inpatients, either an intravenous extended-spectrum cephalosporin along with a macrolide or doxycycline, or an anti-pneumococcal quinolone (gatifloxacin, levofloxacin, moxifloxacin) alone, may be used. Some authorities also include as an option a combination of a ß-lactam with inhibitor along with a macrolide, doxycycline or a fluoroquinolone. The efficacy of quinolone monotherapy in critically ill patients has not been established.[13]

Vancomycin should not be used routinely for the empiric treatment of community-acquired pneumonia.[13]

Once susceptibility tests are complete, therapy should again be adjusted accordingly.

Targeted Therapy Once Susceptibility Tests are Available

- For patients with pneumonia caused by isolates with intermediate-level penicillin resistance (MIC 0.12–1.0 µg/ml) and certain high-level penicillin-resistant isolates (MIC = 2.0 µg/ml), penicillin or extended-spectrum cephalosporins may be sufficient, as high concentrations of antibiotic in serum and tissue are easily achieved with standard parenteral doses.[10,12]

- For patients with pneumonia or sepsis and high-level (MIC ≥ 4.0 µg/ml) penicillin-resistant pneumococcal isolates present in sterile sites, treatment should include alternative antibiotics to which the organism is susceptible.[12,13]

Detailed guidelines outlining specific recommendations for empiric and targeted therapy of invasive pneumococcal disease in children have been published elsewhere.[17-19]

Prevention and Control of Antibiotic-Resistant *Streptococcus pneumoniae*

NYC clinicians play an important role in helping to control the impact of antibiotic-resistant *S. pneumoniae* infections by judiciously prescribing antibiotics, educating patients on antibiotic resistance, and vaccinating patients at risk for invasive pneumococcal disease.

Judicious Antibiotic Use

The greatest risk factor for carriage of infection with antibiotic-resistant *S. pneumoniae* is previous antibiotic use, especially prolonged use.[20]. Physicians can reduce unnecessary antibiotic use in both inpatient and outpatient settings by

- Only using antibiotics when they are likely to benefit the patient.

- Treating with agents that specifically target the likely pathogen(s). This may require performing bacterial culture susceptibility testing when appropriate and then choosing or adjusting antibiotic therapy.

- Encouraging patients to take antibiotics for the dose and length of treatment prescribed.

Detailed guidelines on how to appropriately use antimicrobials for pediatric and adult upper respiratory tract infections have been published recently.[20,21]

Patient Education

Patients need to be informed that inappropriate antibiotic therapy can be harmful to them as individuals, that antibiotic treatments are often unnecessary and of the importance of completing antibiotic treatment as prescribed. The CDC has developed educational materials to help physicians communicate the risks of prescribing unnecessary antibiotics to patients. The materials are comprised of: fact sheets, posters, "prescription" pads outlining treatment for viral illnesses, pamphlets *("A New Threat to Your Health: Antibiotic Resistance"* and *"Your Child and Antibiotics")*, and videotapes that guide physicians on how to talk with patients about antibiotic use.

Free copies of these materials and additional information on current guidelines are available at the following websites: cdc.gov/antibioticresistance, cdc.gov/drugresistance, and cdc.gov/ncidod/dbmd/abcs/default.htm.

Physicians can reduce antibiotic use and positively affect community bacterial resistance rates. A recent study evaluating changes in antibiotic prescribing for children revealed significant and steady declines of antibiotic use from 1989–2000.[22]

Pneumococcal Vaccination

As resistance makes pneumococcal infections more difficult to treat, preventing infections through the use of age-appropriate vaccines in accordance with current immunization guidelines becomes of even greater importance. Use every patient encounter as an opportunity to vaccinate by reviewing the patient's medical history to determine if the patient is at higher risk for invasive pneumococcal disease and meets the criteria for pneumococcal vaccination. The pneumococcal vaccines currently available are the pneumococcal conjugate vaccine (PCV7) and the pneumococcal polysaccharide vaccine (PPV23). By regulation, all insurance plans written in New York State must cover all recommended childhood vaccines. For certain children, these vaccines are available through the Vaccines For Children Program. Medicare covers the PPV23 vaccine.

Pneumococcal Polysaccharide Vaccine (PPV23)

Licensed in 1983, this pneumococcal vaccine is effective against 23 of the most common infection-causing pneumococcal serotypes in the United States and is 60–80% effective in preventing invasive disease.[23] As the immune response to the bacterial capsular polysaccharides of this vaccine is T-cell independent, its use is restricted to individuals older than 2 years of age.[23,24] PPV23 is recommended for all persons ≥ 65 years of age and for those at high-risk for invasive pneumococcal disease (persons

with sickle cell disease, functional or anatomic asplenia, chronic pulmonary or cardiovascular disease, chronic liver disease, diabetes mellitus, alcoholism, immunocompromised states including HIV, CSF leaks, etc.) and prior to elective splenectomy.[23]

The United States National Healthy People 2010 goal for vaccinating persons ≥ 65 years of age with pneumococcal vaccine is 90%.[25] In 1999, the proportion of persons ≥ 65 years of age in NYC who stated that they had been vaccinated against pneumococcal disease was 28%, as compared to 57% in the remainder of New York State.[26] Additionally, there are marked racial and ethnic disparities in vaccination rates; black and Hispanic persons ≥ 65 years of age report receiving the pneumococcal vaccine much less often than do white persons ≥ 65 years of age in New York State.

Routine re-vaccination with PPV23 is not recommended. For persons older than 2 years of age who are at high risk for serious pneumococcal infection and those likely to have a rapid decline in pneumococcal antibody levels, re-vaccination with PPV23 is recommended after 5 years have elapsed since receipt of the first dose of PPV23.[23] Persons ≥ 65 years of age should receive a second dose of vaccine if they were vaccinated five or more years ago and were younger than 65 years of age at the time of primary vaccination.[23] Elderly persons with unknown vaccination status should be administered one dose of PPV23 vaccine.[23]

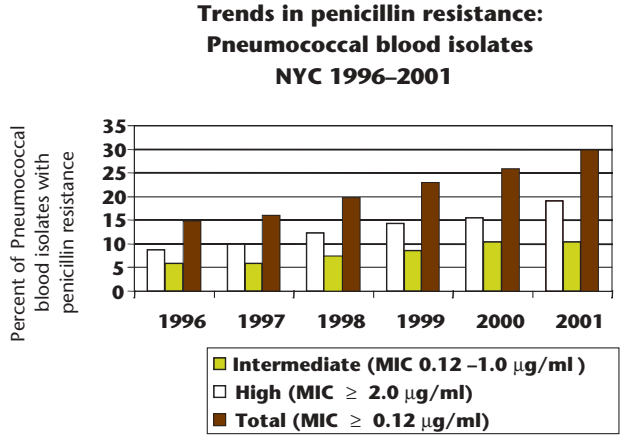
Pneumococcal Conjugate Vaccine (PCV7)

The PCV7 vaccine is effective against seven pneumococcal serotypes that cause more than 80% of the invasive pneumococcal disease in children under 6 years of age.[24] PCV7 was licensed in February 2000 and became part of the NYC vaccine schedule in January 2001. This conjugated vaccine, which elicits an immune response that is T-cell dependent, is highly effective in infants and young children; it also reduces nasopharyngeal carriage rates of *S. pneumoniae*.[24]

The CDC recommendations for PCV7 stratify children into risk categories.[24] As the majority of NYC children are in the high-risk categories, PCV7 is recommended for all children in NYC at 2, 4, 6, and 12–15 months of age. PCV7 is not recommended for children ≥ 5 years of age.[24] Children at highest risk for pneumococcal disease should also receive PPV23.[23, 24]

In order to monitor vaccine failure, the Respiratory Diseases Branch of the CDC tracks invasive pneumococcal disease among infants and children who were vaccinated with at least one dose of PCV7; the NYC DOHMH is facilitating this process. If a child who had received any pneumococcal vaccine presents with invasive pneumococcal disease — isolation of *S. pneumoniae* from a normally sterile site — and there is an isolate available for serotyping, please save the isolate and contact the Bureau of Communicable Diseases at (212) 788-9830.

Figure 1



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Judicious Use of Antibiotics when Treating Acute Otitis Media in Children and the Observation Option

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Acute otitis media (AOM) is the most common illness for which children receive antibiotics and its incidence is reported to be increasing.[1] In 1995, there were over 5 million occurrences of AOM in the United States, incurring close to $3 billion in health care expenditures. The practice of automatically prescribing antibiotics for AOM is currently under scrutiny, as it is thought to contribute to the increase of multi-drug resistant bacteria. Evidence-based analysis performed by the US Agency for Healthcare Research and Quality (AHRQ) reveals that the majority of uncomplicated AOM cases resolve spontaneously without complications and antibiotics provide only a minor benefit to AOM treatment.[2] Additionally, AOM can be remarkably difficult to accurately diagnose, often leading to unnecessary antibiotic treatments.

Diagnostic Certainty

AOM is defined by the AHRQ as the presence of middle ear effusion (MEE) together with the rapid onset of signs or symptoms associated with middle ear inflammation. To properly diagnose AOM, an examiner must be trained in and use pneumatic otoscopy or tympanometry. Signs of middle ear effusion discernable by otoscopic exam are decreased tympanic mobility and erythema, exudate, or bullae. Clinical signs and symptoms for AOM also include fever, ear pain, drainage of pus or blood, irritability, anorexia, and vomiting.[3] Confirming the presence of MEE is often difficult in a child with uncooperative behavior, narrow ear canals, or obstructing cerumen. Additionally, a child may present with a red ear that is actually due to tympanic membrane erythema resulting from viral myringitis or vascular dilatation due to crying.[4] A child who tugs on his or her ears, perhaps with an upper respiratory infection or undergoing teething, may be erroneously assumed to have AOM.

Diagnostic accuracy is the cornerstone for appropriate antibiotic use, yet physicians often prescribe antibiotics when they are only 50% certain that a child has AOM.[5] Providers often prescribe antibiotics for children with questionable AOM to placate parents. Diagnostic uncertainty results in a high proportion (~26%) of unnecessary AOM antibiotic prescriptions,[4] greatly increasing multi-drug resistant bacteria. Uncertainty surrounding the diagnosis of AOM is understandable, however, it is inappropriate to treat with antibiotics defensively.

The Observation Option

Watchful waiting can be a suitable initial treatment of AOM. Used commonly in the Netherlands and certain Scandinavian countries, the AOM observation option[6] is beginning to gain acceptance in the United States. With this strategy, physicians defer antibiotic treatment of selected children for up to 3 days, during which time treatment is limited to analgesics and other symptomatic relief (Table 1). This strategy is recommended for children who present with uncomplicated AOM, but are otherwise healthy. With appropriate follow-up, the observation option does not increase complications and leads to outcomes comparable with those of using antibiotics (Table 2). Additionally, the strategy has proven feasible in a range of settings, including private practice, publicly-funded clinics, and emergency rooms.

When making AOM treatment decisions, physicians should consider the observation option in addition to the option of prescribing either a short (≤ 5 days) or full course of antibiotics (7–10 days). Initial full-course antibiotic therapy is recommended for all children under 2 years of age with a certain diagnosis of AOM because young children have a poorer natural history of AOM and are shown to derive greater benefits from a full course of antibiotic therapy. In contrast, older children are suitable candidates for the observation option or short-course therapy, particularly when their illness is mild or AOM cannot be diagnosed with certainty. The observation option is increasingly appealing as the widespread use of haemophilus and pneumococcal vaccines may further increase the proportion of AOM due to viral causes. Short-course therapy offers the dual benefit of easy administration and reduced incidence of resistant pneumococci after therapy.

Table 1: Guidelines for judicious use of antibiotics in treating AOM

< 6 months of age → **Always use a full course of antibiotics***

6 months to < 2 years of age
- **If there is a certain AOM diagnosis,** always use antibiotics*
- **If there is an uncertain AOM diagnosis,**
  - for severe illness,**** use antibiotics*
  - for mild illness,**** use the observation option***

≥ 2 years of age
- **If there is a certain AOM diagnosis,**
  - for severe illness,**** use antibiotics*
  - for mild illness,**** use the observation option***
- **If there is an uncertain AOM diagnosis,** use the observation option***

*Children under 2 years of age with a certain diagnosis of AOM receive a full course of antibiotics.

**Children ≥ 2 years or age receive either a short or full course of antibiotics, based on the judgment of a clinician and parental preference.

***The observation option is **only appropriate** when follow-up (by telephone or in person) can be assured for the next 72 hours and it will be possible to start antibiotics if symptoms persist or worsen.

****__Mild illness__ is mild otalgia and fever < 39°C orally (102°F) or < 39.5°C rectally (103°F) in the past 24 hours; **severe illness** is moderate to severe otalgia **or** higher fever **or** a judgment by a clinician that the child is toxic in appearance or severely ill.

Several aspects of the guidelines in Table 1 deserve special emphasis:

1. The observation option is **only appropriate** for initial management of AOM when follow-up can be assured. Antibiotics can be started if the child fails to improve by 72 hours. In some cases, parents can be given an antibiotic prescription and instructed to fill it only if their child's symptoms persist or worsen.

2. Because of some of the difficulties in detecting MEE, a degree of uncertainty often exists when diagnosing AOM. This uncertainty is accounted for in the management decisions outlined in the table.

3. At present, the observation option is **not recommended** for children 6 months to < 2 years of age with a **certain** diagnosis of AOM.
4. These guidelines are options, not mandates. Provider experience and judgment are essential to assessing diagnostic certainty, illness severity, and the ultimate suitability of any particular child for observation option or short-course antibiotics.
5. Parents must be involved in the discussion of treatment choices and educated on the desirability of avoiding unnecessary antibiotics.

There are some situations in which the observation option is not appropriate. If the provider deems that follow-up cannot be guaranteed because of a barrier to care (socioeconomic, geographic, familial instability, scheduling issues, lack of insurance, etc.), then the observation option is not appropriate for that child and antibiotics should be prescribed. Other children who are not candidates for the observation option include children with immune deficiency, complicated AOM, AOM relapse within 30 days, craniofacial syndromes, co-existing sinusitis or streptococcal pharyngitis.

Liberal use of analgesics for 24 hours after diagnosis is recommended since an estimated one-third of all children — and nearly two-thirds of children < 2 years of age — remain symptomatic regardless of whether they were only observed or treated. Asymptomatic MEE may persist up to several months. Parents should be informed that persistent MEE might cause transient hearing loss, but additional antibiotics will not hasten its resolution. A 1999 treatment algorithm for otitis media with effusion (OME) is outlined in "A Practitioner's Guideline for Children Suspected of Having a Middle Ear Infection," which can be found at health.state.ny.us/nysdoh/antibiotic/antibiotic.htm.

Choice of Antibiotic

If antibiotic treatment is chosen, the first-line drug for AOM is amoxicillin (40mg/kg/day); for penicillin-allergic patients, it is trimethoprim-sulfamethoxazole. Second-line drugs include amoxicillin (80mg/kg/day), amoxicillin/clavulanate, macrolides, and cephalosporins.[7,8]

The Observation Option Toolkit

In order to promote evidence-based judicious antibiotic use in AOM, the New York State Department of Health (NYS DOH) and The New York Region Otitis Project developed the Observation Option Toolkit. The toolkit, which is currently under consideration by the Centers for Disease Control and Prevention, helps clinicians implement the observation option in patient care, should they choose to do so.

Specifically, the Toolkit includes:

- an overview of treatment guidelines
- health care provider information sheets
- parent or caregiver information sheets
- an annotated bibliography.

The kit does not present the observation option as the preferred method of management, nor does it contain a rigid practice guideline to replace clinician judgment.

The Observation Option Toolkit can be obtained by contacting the NYS DOH at (518) 474-9219 or at health.state.ny.us/nysdoh/antibiotic/antibiotic.htm.

Table 2: Expected AOM clinical outcomes based on published evidence, dispelling certain myths surrounding the observation option

1. Clinical success at 24 hours occurs for 55–65% of children, and the proportion of clinical success is lower for children < 2 years of age.
2. Clinical success at 24 hours is not affected by initial antibiotic therapy.
3. Clinical success by 2–7 days occurs in 85–95% of children; antibiotic use accounts for the success of only 5–15% of these cases. The benefit of antibiotics is greater in children < 2 years of age.
4. On days 2–7 of therapy, 8 children with AOM need to be treated with antibiotics to avoid a single case of clinical failure.
5. Although, antibiotics have been prescribed to prevent the serious complications of AOM, mastoiditis and other suppurative complications do not occur more frequently when the observation option is used, provided that children are followed closely and observation failures receive antibiotics.
6. At 1 month, asymptomatic MEE persists in 35–45% of children; at 3 months it persists in 10–25% of children. Use of additional antibiotics will not hasten asymptomatic MEE resolution.
7. A full course of antibiotics (7–10 days) increases the frequency of resolution of AOM at 10–14 days by 8% compared to a short course; this effect is greater (12–20%) in children < 2 years of age.

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Considering Drug Resistance During the Management of Sexually Transmitted Diseases

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Of the more than 30 organisms that are sexually transmissible, the following six have been significantly affected by drug resistance: *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, herpes simplex virus (HSV), human immunodeficiency virus (HIV), *Ureaplasma urealyticum, and Haemophilus ducreyi* (not covered here). To avoid treatment with antimicrobials for which resistance has become widespread, national recommendations for the management of sexually transmitted diseases (STDs) are periodically revised. Care must be taken to select a first-line therapy for these STDs based on an understanding of current patterns of drug susceptibility and to consider drug resistance for infections that persist following standard treatment regimens.

Directly Observed Therapy

One of the key principles in STD management is directly observed therapy (DOT) with a single dose regimen. DOT maximizes therapy compliance, minimizes the risk of persistent infection, and limits the development of drug resistance. DOT can be utilized for the treatment of nearly all curable STDs (Table 1) and should be used whenever possible.

Considering Drug Resistance in Clinical Practice

A patient who completes an appropriate STD treatment regimen, but experiences ongoing signs and symptoms in addition to persistently positive laboratory tests, could be infected with a drug-resistant organism. Although drug resistance should always be considered when evaluating a patient with persistent infection, more common causes should be assessed as well. Persistent infection can also result from poor patient adherence to the recommended regimen, or re-infection of the patient by a new or ongoing partner who has not received proper treatment. When evaluating a patient with a persistent infection, determine: 1) the degree to which the patient has complied with previous therapy 2) the treatment status of all partners and 3) the likelihood that the patient has been re-infected (i.e. a history of new sexual partners since initiating treatment).

Neisseria gonorrhoeae

Unlike other gram-negative bacteria, *Neisseria gonorrhoeae* (GC) is inherently sensitive to many antibacterial agents.[2] Nevertheless, resistance has developed as a result of the gradual accumulation of chromosomal mutations and the appearance of plasmids that are capable of conferring high-level antimicrobial resistance in a single step.[3] Prior to the use of penicillin, a common therapy for GC infection was sulfanilamide. Within a decade of the introduction of this therapy, however, resistance developed to the extent that one-third of patients given maximal doses of sulfanilamide for GC had persistent infection.[3] Penicillin treatment, which became the therapy of choice by the end of World War II, was also undermined by chromosomal mutation of the GC organism. From the 1950s to the 1970s, the dosage of penicillin needed for adequate treatment rose as the level of penicillin resistance in GC increased.[4,5] This early resistance to penicillin is thought to have been the result of chromosomal DNA mutations that altered the structure of cell surface proteins.[2,6]

In 1976, a beta-lactamase-producing strain of *Neisseria gonorrhoeae* was isolated; this marked the discovery of a new form of GC resistance, one conferred by an extrachromasomal DNA plasmid.[7] By the early 1980s, reports of beta-lactamase-positive cases of GC in the United States increased substantially, most likely resulting from importation of infections from endemic areas of the world such as the Philippines, Korea, and various countries of Africa.[8] During these early outbreaks of drug-resistant GC in the United States, the risk factors for infection with a beta-lactamase-producing GC were sexual contact with a female sex worker and overseas travel.[9,10] By 1987, 1.8 % of all GC cases reported in the United States were caused by beta-lactamase-positive isolates; the majority of these cases were found in the cities of New York and Los Angeles and the state of Florida.[9,11]

In 1986, in response to the growing problem of drug resistant GC, the CDC implemented the Gonococcal Isolate Surveillance Project (GISP): a sentinel surveillance system that coordinates monthly drug sensitivity testing of gonococcal isolates from 25 cities across the United States.[12] Sentinel surveillance activities, such as GISP, will become even more important in the future as bacterial culturing is replaced by DNA testing (PCR, LCR, gene probe) that lacks the ability to assess drug susceptibility. Use of

Table 1

CDC 2002 Guidelines for the Treatment of Sexually Transmitted Diseases[1] Single Dose Regimens

Gonorrhea
- Ceftriaxone 125mg Intramuscular injection x 1,* or
- Cefixime 400mg orally x 1, or
- Ciprofloxacin 500mg orally x 1,* or
- Ofloxacin 400mg orally x 1, or
- Levofloxacin 250mg orally x 1

Chlamydia/Non-gonococcal urethritis (NGU)
- Azithromycin 1g orally x 1

Trichomoniasis
- Metronidazole 2g orally x 1

Early Syphilis (Primary, Secondary, and Early Latent)
- Benzathine Penicillin G 2.4 mU Intramuscular injection x 1

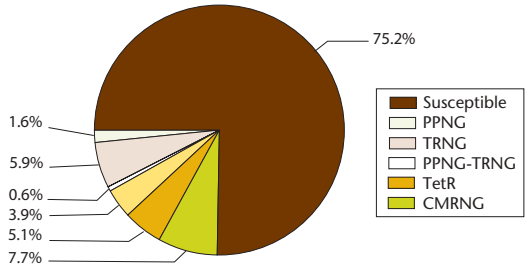
Chancroid (ie. Haemophilus ducreyi)**
- Azithromycin 1g orally x 1, or
- Ceftriaxone 250mg Intramuscular injection x 1

* Preferred therapy for pharyngeal GC.

** Although single dose regimens for the treatment of chancroid are CDC-recommended, it is still necessary to closely follow patients to ensure that their infection resolves.

Figure 1

Gonococcal Isolate Surveillance Project (GISP) — Penicillin and tetracycline resistance among GISP isolates, 2000



Note: PPNG=penicillinase-producing *N gonorrhea;* TRNG=plasmid-mediated tetracycline resistant *N gonorrhea;* PPNG-TRNG–plasmid mediated penicillin and tetracycline resistant *N gonorrhea;* PenR-chromosomally mediated penicilin resistant *N gonorrhea,* TetR=chromosomally mediated tetracycline resistant *N gonorrhea,* CMRNG=chromosomally mediated penicillan and tetracycline resistant *N gonorrhea.*

CDC, Division of STD Prevention

these nucleic acid-based tests, instead of bacterial culturing, will increase the difficulty of both detecting emerging drug resistance and monitoring widespread resistance patterns.

Paralleling the development of penicillin-resistant GC, tetracycline-resistant GC and macrolide-resistant GC also emerged. During the 1990s, penicillin and tetracycline resistance, either chromosomal or beta-lactamase plasmid forms, accounted for approximately one-third of GC isolates.[13] By 2000, 25% of the GC isolates analyzed by GISP were resistant to penicillin, tetracycline, or both (Figure 1).[14] The use of penicillin and tetracycline as first-line treatments for GC infection continues to be discouraged.[1]

An emerging concern in the treatment of GC infections has been the occurrence of reduced susceptibility to fluoroquinolones. Throughout the past decade, fluoroquinolone-resistant GC rapidly increased around the globe. In 1995, in Hong Kong and the Philippines, approximately 10% of all GC strains were resistant to fluoroquinolones[15] and in the Far East, nearly half of GC isolates demonstrate decreased susceptibility to ciprofloxacin and ofloxacin.[15] In these areas, a history of self-initiated antibiotic treatment has been associated with the development of resistant infection. GISP documented yearly increases of fluoroquinolone-resistant GC within the United States since 1998; in 2000, 1.6% of GC isolates showed decreased susceptibility to ciprofloxacin (Figure 2).[16] In 2000, the prevalence of ciprofloxacin resistance was found to be particularly high in Honolulu (14.3%) and Orange County, California (5.6%).[16] These trends suggest that fluoroquinolone resistance may soon limit the usefulness of ciprofloxacin and other drugs in this class as a treatment for GC infections here in the United States. Fortunately, GISP has documented no evidence of resistance to ceftriaxone or cefixime, two first-line medications currently recommended by the CDC for the treatment of GC.[14]

Clinical Recommendations Regarding Antibiotic-Resistant *Neisseria gonorrhoeae* (GC)[16]

Because of the high prevalence of resistant organisms, current CDC STD Treatment Guidelines[1] do not recommend penicillin or tetracycline regimens for the treatment of GC infections.

The CDC currently recommends obtaining a travel history of all patients for whom fluoroquinolone therapy is being considered and avoiding fluoroquinolones if there is any likelihood that the patient or his or her sexual partner(s) may have contracted their infection in Asia, the Pacific Islands, or Hawaii. Recent increases in the prevalence of fluoroquinolone-resistant GC strains in California render treatment of GC cases originating from California with fluoroquinolones inadvisable.

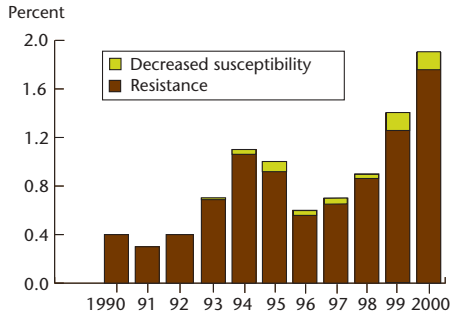
Any patient in whom drug-resistant GC infection is suspected (i.e. persistent signs or symptoms of infection despite compliance with therapy and low likelihood of re-infection) should have a culture performed along with antimicrobial susceptibility testing. The New York City Department of Health and Mental Hygiene (NYC DOHMH) requires reporting of all cases of GC regardless of drug susceptibility. For assistance regarding confirmation and further evaluation of GC isolates found to be resistant to fluoroquinolones, ceftriaxone, cefixime, azithromycin, or spectinomycin contact the NYC DOHMH Bureau of STD Prevention and Control at (212) 788-4448.

Trichomonas vaginalis

Metronidazole, the first effective pharmacologic agent against trichomoniasis, was introduced in 1958 and remains the primary trichomoniasis therapy despite the development of related agents. Persistent vaginal trichomoniasis can result from sub-optimal compliance with standard treatment, re-infection, or drug resistance. *Trichomonas vaginalis* isolates with *in vitro* resistance to high doses of metronidazole have been recovered from patients who have persistent infection despite receiving standard therapy. The biological basis for metronidazole resistance remains unclear.[17–19]

Figure 2

Gonococcal Isolate Surveillance Project (GISP) — Percent of Neisseria gonorrhea isolates with decreased susceptibility or resistance to ciprofloxacin, 1990–2000



Resistant isolates have ciprofloxacin MICs ≥1 µg/ml. Isolates with decreased susceptibility have ciprofloxacin MICs of 0.125–0.5 µg/ml. There were 61resistant isolates: one in 1991, one in 1993, two in 1994, eight in 1995, two in 1996, five in 1997, four in 1998, 19 in 1999, and 19 in 2000. Susceptibility to ciprofloxacin was first measured in GISP in 1990.

CDC, Division of STD Prevention

Clinical Management of Suspected Metronidazole-Resistant *Trichomonas vaginalis*

If treatment failure occurs following standard metronidazole therapy (e.g., Metronidazole 2g orally single dose; Metronidazole 500mg orally twice daily for seven days), where partners have been adequately treated and re-infection is unlikely, the patient should be retreated with metronidazole 500mg orally, twice daily, for seven days.[1] If infection continues to persist, treatment with a higher-dose metronidazole regimen (e.g., one 2g oral dose daily for 3–5 days) can be administered.[1] If a cure is not achieved and laboratory testing remains positive, *T. vaginalis* cultures and metronidazole susceptibility testing should be performed. Patients whose *T. vaginalis* isolates are found to have a high-level of metronidazole resistance should be managed in consultation with an expert.

Herpes simplex virus (HSV)

Antiviral therapies currently used in routine treatment of HSV infection (acyclovir, famciclovir, valacyclovir) share a similar mechanism of action, requiring activation by two viral enzymes, the HSV thymidine kinase (TK) and the HSV DNA polymerase.[20] Mutation or deficiency of these enzymes can limit the therapeutic effectiveness of HSV medications, resulting in what is referred to as acyclovir resistance.

National multicenter surveillance indicates that the prevalence of acyclovir resistance among patients with symptomatic genital herpes is 0.1–1.3%,[21] although acyclovir resistance is not associated with the success of antiviral therapy or clinical course of HSV disease.[22] Clinically significant disease caused by acyclovir resistance is seen primarily in **immunocompromised** patients and usually manifests as chronic progressive ulcerative mucocutaneous lesions with prolonged viral shedding.[20] As of yet, there are no clear risk factors for developing acyclovir resistance.

In contrast to bacterial drug resistance, acyclovir resistance demonstrates a few unusual characteristics: 1) Historically, the frequency of this resistance has **not** increased with increased usage of acyclovir or other antivirals, nor does acyclovir resistance appear to be associated with the prolonged use of suppressive

therapy (e.g., daily acyclovir for ≥ 6 years)[20,23] 2) Transmission of acyclovir-resistant isolates from person to person has not been documented, although the possibility has not been excluded[20] 3) Following resolution of an episode of acyclovir-resistant HSV ulcerations, recurrent outbreaks often demonstrate adequate susceptibility to these medications.[24,25]

Clinical Management of HSV Disease that is Unresponsive to Standard Doses of Acyclovir

Currently, routine acyclovir susceptibility testing of patients presenting with genital herpes is **not** recommended. Patients who fail to respond to standard acyclovir regimens, especially in the presence of a compromised immune system, including persons with AIDS, should have a viral culture isolate obtained for sensitivity testing.

All acyclovir-resistant strains are also resistant to valacyclovir and most are resistant to famciclovir.[1] Patients with acyclovir-resistant HSV should be managed in consultation with an expert in order to determine an appropriate alternate therapy. Non-acyclovir HSV regimens found to be successful include intravenous foscarnet and topical cidofovir gel; topical cidofovir gel, although not commercially available, can be formulated by local pharmacies from intravenous preparations.[22,26-29] These alternate therapies are not routinely used to treat HSV in the absence of acyclovir resistance as they may have more adverse effects.

Ureaplasma urealyticum

Ureaplasma urealyticum is estimated to cause approximately 40% of non-gonococcal urethritis (NGU) cases and the majority of *Chlamydia trachomatis*-negative NGU cases.[30] Several studies show an association between persistent urethritis that has been treated with either tetracycline or minocycline and the presence of tetracycline-resistant *U. urealyticum*.[31,32] This suggests that patients with NGU (where chlamydia testing is negative or where a specific microbial etiology has not been confirmed), which persists following doxycycline therapy, may respond to a non-tetracycline regimen (e.g., azithromycin 1g orally).

Clinical Management of Persistent Non-Gonoccocal Urethritis (NGU)

Persistent NGU can be defined as the persistence of symptoms in association with any of the following: 1) urethral discharge on examination 2) a urethral gram stain showing multiple white blood cells (5 WBC/oil immersion 1000x field) 3) 10 WBCs/high powered field (400x) on first-void urine sediment 4) a positive leukocyte esterase test.

In cases of persistent NGU consider the following:

- Poor adherance to a multidose/multiday therapy
- Re-infection from a new or untreated ongoing sexual partner (i.e. the patient may be experiencing recurrent rather than persistent urethritis and requires re-treatment with a first-line therapy)
- Urethral trichomoniasis (treatable with metronidazole 2g orally x 1)
- Tetracycline-resistant ureaplasma, if originally treated with doxycycline (treatable with azithromycin 1g orally x 1)
- Other etiologies of urethritis, e.g., infection with gram-negative bacilli (associated with insertive anal sex), herpetic urethritis, intra-urethral condyloma, chemical irritation, autoimmune disorders.

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Drug Resistance and Tuberculosis

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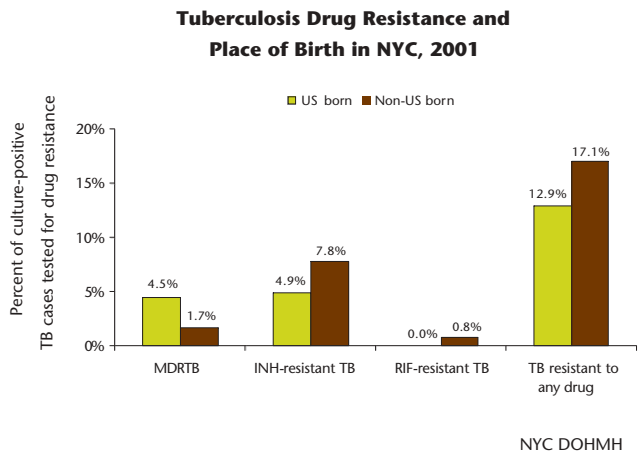
Drug-resistant *Mycobacterium tuberculosis* (TB) poses a serious threat to global and local TB control efforts. The prevalence of drug-resistant TB is significant and the few drugs available to treat it are expensive, less effective, and more toxic than drugs used to treat drug-susceptible TB. TB disease that is resistant to at least isoniazid (INH) and rifampin is termed multidrug-resistant tuberculosis (MDRTB). A recent survey by the World Health Organization, which evaluated global TB drug resistance trends in 58 geographical sites from 1996–1999, demonstrates the presence of drug-resistant TB in numerous countries.[1] The median prevalence of MDRTB among new cases of TB was considerable in Estonia (14.1%), the Henan (10.8 %) and Zhejiang (4.5%) provinces of China, Latvia (9.0 %), and the Russian regions of Ivanovo (9.0 %) and Tomsk (6.5 %).[1] MDRTB world trends are relevant to New York City (NYC) TB control efforts, as the proportion of persons in NYC infected with TB who were born outside of the United States is 66%, and this proportion is increasing.[2] China, for example, has contributed the largest number of TB cases in NYC for several years.[2] The proportion of persons in NYC with MDRTB who were born outside of the United States has also increased, most likely a reflection of the high MDRTB rates in the countries from where these persons originated and control of MDRTB in NYC. (Figure 1)

In the 1990s, there was an epidemic of MDRTB in the United States, with NYC as the epicenter. A national survey conducted in the early 1990s by the Centers for Disease Control and Prevention (CDC) indicated that 3.3% of TB isolates encountered in the United States were MDRTB; 60% of these national MDRTB isolates were from NYC.[3] In 1991, 19% of TB patients in NYC had MDRTB.[4] Since then, MDRTB cases have decreased dramatically, both nationally and in NYC. From 1992–2000, newly-diagnosed MDRTB cases decreased nationally by 70%; in NYC they decreased by 95%.[2] Other forms of TB drug resistance have decreased only slightly in the past decade from 14.3% to 13.2%. (Figure 2)

How Does TB Drug Resistance Emerge?

TB drug resistance can be acquired if a provider does not properly manage a TB case or a patient with TB does not fully adhere to the prescribed therapy. Once drug-resistant TB has emerged in a patient, it can be transmitted, leading to primary infections of drug-resistant TB. In *M. tuberculosis* a mutation able to impart resistance to rifampin occurs in approximately one out of every 10^{10} cell divisions; a mutation able to impart INH resistance occurs in one out of every 10^{7}–10^{9} cell divisions (Girling).[5] In an environment without the selective pressure of anti-TB drugs, a TB cavity would contain on average only one rifampin-resistant bacillus per every 10^{8} bacilli and one INH-resistant bacillus per every 10^{6} bacilli.[5] Even patients with the most infectious form of TB, severe cavitary pulmonary TB, are unlikely to develop clinically significant drug-resistant TB disease when they are not taking anti-TB drugs.[5] If a single anti-TB drug is administered, however, drug resistant TB can emerge in as rapid a time period as 2–4 weeks.[5] Therefore, current recommendations for multi-drug therapy are designed to prevent the emergence of resistance.

Figure 1



In 2001, non-US born TB patients were more likely than US-born TB patients to have MDRTB or to have resistance (res) to any first-line TB drugs [isoniazid resistance (INH), rifampin resist (RIF)].

Preventing the Emergence of TB Drug Resistance

Treatment of confirmed or suspected TB disease should begin with four first-line drugs: rifampin, isoniazid (INH), pyrazinamide (PZA) and ethambutol.[6-8] Once the TB strain is shown to be susceptible to all four drugs, ethambutol should be discontinued. Additionally, as ethambutol can lead to decreased visual acuity, it should be avoided in children too young to undergo objective vision testing.[6-8] PZA should be discontinued after two months of therapy and is not recommended for routine use in pregnant women.[6-8] Some clinicians choose to use fewer drugs in elderly individuals because they fear that increased toxicity will occur and they believe that the elderly do not have the risk factors for drug-resistant TB. Rates of TB drug resistance in NYC elderly, however, are approximately 4% (the threshold for using four drugs); therefore, the four-drug regimen should be the treatment of choice until susceptibility results are known and the regimen can be modified.[2]

All patients undergoing TB treatment should be seen by their provider on a monthly basis and evaluated for response

to treatment, adherence, and adverse reactions. The possibility of drug resistance should be entertained if a patient is not responding to treatment, based on clinical or laboratory parameters. If drug resistance is demonstrated, treatment in consultation with experts on drug-resistant TB should be undertaken. Information on how to treat drug-resistant TB and on alternative drugs for patients who are unable to tolerate first-line drugs can be found in the Clinical Policies and Protocols (3rd ed.),[9] a manual published by the New York City Department of Health and Mental Hygiene (NYC DOHMH) that is available at nyc.gov/html/doh/pdf/tb/manu.pdf.

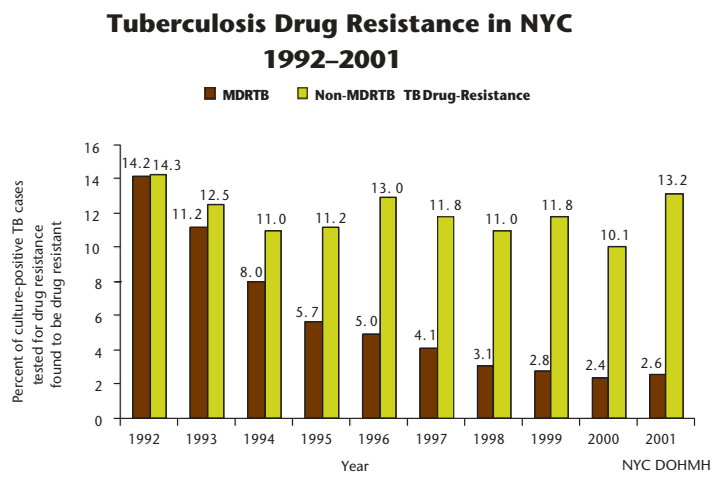
DOT is the Standard of Care in the Treatment of TB

Studies show that clinicians cannot accurately predict which patients will adhere to treatment.[10,11] Direct observation of treatment is the preferred method for ensuring full TB treatment and is the standard of care. The recent success achieved by NYC in dramatically reducing MDRTB rates can be attributed to the implementation of sound TB control practices, which included standardization of TB drug regimens, and widespread use of directly observed therapy (DOT). In DOT, a health care worker is responsible for observing patients ingest their TB drugs. This approach to TB treatment stemmed from the high rates of and unpredictability associated with patients not adhering to treatment regimens.[12,13] DOT has demonstrated success in ensuring cure and preventing the emergence of MDRTB, allowing for a considerably more cost-effective treatment strategy.[13] Additionally, DOT facilitates intermittent dosing of TB drugs (two or three doses per week), which can only be administered if DOT is provided. If DOT cannot be implemented, some TB control experts advocate the use of fixed-dose combinations (preformed pills containing two or more drugs in a single pill). This method reduces pill burden and, more important, reduces the chance that MDRTB will occur by preventing patients from taking only a single drug.[8]

Physicians at the NYC DOHMH TB Control Program are available for consultation on all aspects of TB; providers can reach them by calling (212) 442-9968 and asking to speak to the physician on-call. Providers can also call this number to request DOHMH TB publications. For more information on the diagnosis and management of TB, please refer to the Department's *Clinical Policies and Protocols* (3rd ed.) manual described previously. Important telephone numbers and TB fact sheets, including the treatment of TB in patients with HIV infection, can be accessed at the website of the NYC DOHMH Bureau of TB Control: nyc.gov/html/doh/html/tb/tb.html.

Patients can receive all of their treatment and medications free of charge at the NYC DOHMH Chest Centers located throughout the five boroughs. Call the Chest Centers directly to make referrals. The name, location, telephone number, and days of operation for each Chest Center can be found on the resource section on the back cover.

Figure 2



While the proportion of MDRTB among patients who had undergone drug susceptibility testing decreased from 14.2% in 1992 to 2.6% in 2001, the proportion of patients with non-MDRTB drug resistance remained relatively stable.

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Vital Events and Reportable Diseases and Conditions, 1982 to 2001[1]

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Vital Events ~ Number (Rate)																				
Live Births Per 1,000 Population	111,487 (15.7)	112,353 (15.7)	113,332 (15.8)	118,542 (16.5)	122,108 (16.9)	127,386 (17.6)	132,226 (18.2)	137,673 (18.9)	139,630 (19.1)	138,148 (18.7)	136,002 (18.2)	133,583 (17.8)	133,662 (17.6)	131,009 (17.1)	126,901 (16.4)	123,113 (15.8)	124,252 (15.8)	123,739 (15.6)	125,563 (15.7)	124,024 (15.5)
Deaths (excluding WTC deaths) Per 1,000 Population	73,083 (10.3)	73,544 (10.3)	74,278 (10.4)	74,852 (10.4)	75,702 (10.5)	76,448 (10.5)	77,817 (10.7)	75,957 (10.4)	73,875 (10.1)	72,421 (9.8)	71,001 (9.5)	73,408 (9.8)	71,038 (9.4)	70,769 (9.2)	66,784 (8.6)	62,506 (8.0)	61,010 (7.8)	62,470 (7.9)	60,869 (7.6)	60,218 (7.5)
WTC Deaths[2] (Preliminary data, reported by 7/18/02)																				2,719
Infant Mortality Per 1,000 Live Births	1,706 (15.3)	1,603 (14.3)	1,540 (13.6)	1,591 (13.4)	1,566 (12.8)	1,673 (13.1)	1,770 (13.4)	1,827 (13.3)	1,620 (11.6)	1,575 (11.4)	1,390 (10.2)	1,366 (10.2)	1,207 (9.0)	1,155 (8.8)	992 (7.8)	881 (7.1)	843 (6.8)	848 (6.9)	839 (6.7)	760 (6.1)
Reportable Diseases and Conditions ~ Number of Cases (Rate per 100,000 Population) **(*) Rate Less Than 0.1. NA Not Available**																				
AIDS[3] Acquired immunodeficiency syndrome	542 (7.6)	1,094 (15.3)	1,844 (25.7)	2,872 (39.9)	4,208 (58.3)	5,211 (71.9)	6,448 (88.7)	6,857 (94.0)	7,724 (105.5)	9,016 (122.0)	10,820 (145.1)	12,676 (168.5)	12,664 (166.9)	11,294 (147.5)	9,275 (120.0)	7,350 (94.3)	5,523 (70.2)	5,124 (64.6)	5,624 (70.2)	4,611 (57.6)
Amebiasis	2,176 (30.6)	2,145 (30.0)	1,326 (18.5)	732 (10.2)	NA	206 (2.8)	102 (1.4)	260 (3.6)	411 (5.6)	438 (5.9)	476 (6.4)	708 (9.4)	701 (9.2)	979 (12.8)	867 (11.2)	837 (10.7)	977 (12.4)	861 (10.8)	641 (8.0)	554 (6.9)
Animal Bites[4]	14,904 (209.3)	14,757 (206.5)	13,628 (190.0)	12,856 (178.6)	9,815 (135.9)	9,079 (125.3)	8,287 (114.0)	8,020 (109.9)	8,401 (114.7)	10,816 (146.4)	12,798 (171.7)	14,357 (190.9)	14,188 (186.9)	13,032 (170.2)	12,627 (163.4)	9,730 (124.8)	9,396 (119.4)	9,108 (114.8)	8,523 (106.4)	8,134 (101.6)
Anthrax[5]																				5 (0.1)
Babesiosis	NA	NA	NA	NA	NA	1 (*)	4 (0.1)	2 (*)	1 (*)	5 (0.1)	3 (*)	2 (*)	4 (0.1)	7 (0.1)	8 (0.1)	7 (0.1)	16 (0.2)	11 (0.1)	10 (0.1)	17 (0.2)
Botulism	2 (*)	3 (*)	1 (*)	2 (*)	4 (*)	2 (*)	4 (0.1)	1 (*)	1 (*)	3 (*)	2 (*)	3 (*)	1 (*)	0 (*)	2 (*)	2 (*)	1 (*)	1 (*)	1 (*)	4 (0.1)
Brucellosis	0 (*)	1 (*)	1 (*)	2 (*)	4 (*)	0 (*)	4 (*)	2 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)	0 (*)	0 (*)	1 (*)	0 (*)	0 (*)	1 (*)
Campylobacteriosis	NA	NA	NA	NA	236 (3.3)	267 (3.7)	302 (4.2)	667 (9.1)	788 (10.8)	899 (12.2)	1,173 (15.7)	1,286 (17.1)	1,342 (17.7)	1,266 (16.5)	1,244 (16.1)	1,044 (13.4)	960 (12.2)	744 (9.4)	870 (10.9)	724 (9.0)
Chancroid	480 (6.7)	428 (6.0)	340 (4.7)	1,323 (18.4)	2,179 (30.2)	3,103 (42.8)	3,237 (44.5)	2,277 (31.2)	1,575 (21.5)	1,216 (16.5)	837 (11.2)	592 (7.9)	353 (4.7)	330 (4.3)	160 (2.1)	142 (1.8)	73 (0.9)	39 (0.5)	26 (0.3)	3 (*)
Chlamydia[6]													25,725 (339.0)	26,500 (346.1)	26,454 (342.4)	27,700 (355.3)	26,129 (332.2)	26,766 (337.2)	26,170 (326.8)	29,649 (370.2)
Cholera	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	2 (*)	0 (*)	2 (*)	5 (0.1)	3 (*)	0 (*)	1 (*)	1 (*)	0 (*)	1 (*)	2 (*)	0 (*)	0 (*)	1 (*)
Cryptosporidiosis													289 (3.8)	483 (6.3)	335 (4.3)	172 (2.2)	207 (2.6)	261 (3.3)	172 (2.2)	123 (1.5)
Cyclosporiasis																94 (1.2)	26 (0.3)	18 (0.2)	16 (0.2)	20 (0.3)
Ehrlichiosis															2 (*)	1 (*)	0 (*)	1 (*)	1 (*)	3 (*)
Encephalitis[7]	21 (0.3)	14 (0.2)	9 (0.1)	18 (0.3)	21 (0.3)	8 (0.1)	6 (0.1)	9 (0.1)	12 (0.2)	5 (0.1)	9 (0.1)	4 (0.1)	11 (0.1)	8 (0.1)	4 (0.1)	14 (0.2)	15 (0.2)	143 (1.8)	178 (2.2)	172 (2.2)
Escherichia coli O157:H7													11 (0.1)	7 (0.1)	20 (0.3)	20 (0.3)	14 (0.2)	18 (0.2)	23 (0.3)	16 (0.2)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Giardiasis	201 (2.8)	265 (3.7)	NA	NA	NA	213 (2.9)	290 (4.0)	496 (6.8)	810 (11.1)	944 (12.8)	1,116 (15.0)	1,938 (25.8)	2,457 (32.4)	2,485 (32.5)	2,288 (29.6)	1,783 (22.9)	1,958 (24.9)	1,895 (23.9)	1,770 (22.1)	1,525 (19.0)
Gonorrhea	46,960 (659.4)	46,117 (645.3)	48,032 (669.7)	58,532 (813.3)	69,998 (969.2)	66,545 (918.2)	54,099 (743.9)	40,533 (555.5)	35,236 (481.2)	28,945 (391.8)	21,709 (291.2)	18,477 (245.6)	19,246 (253.6)	16,361 (213.7)	12,998 (168.2)	14,194 (182.1)	12,100 (153.8)	12,207 (153.8)	11,669 (145.7)	12,614 (157.5)
Granuloma inguinale	3 (*)	6 (0.1)	3 (*)	5 (0.1)	26 (0.4)	1 (*)	1 (*)	0 (*)	2 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)
Hemolytic uremic syndrome[8]														4 (0.1)	2 (*)	0 (*)	0 (*)	7 (0.1)	3 (*)	2 (*)
Hepatitis A[9]	689 (9.7)	507 (7.1)	560 (7.8)	NA	NA	172 (2.4)	368 (5.1)	502 (6.9)	791 (10.8)	1,285 (17.4)	903 (12.1)	1,029 (13.7)	944 (12.4)	1,014 (13.2)	619 (8.0)	923 (11.8)	590 (7.5)	412 (5.2)	550 (6.9)	454 (5.7)
Hepatitis B[9]	1,117 (15.7)	1,327 (18.6)	1,528 (21.3)	NA	NA	1,213 (16.7)	1,307 (18.0)	1,418 (19.4)	674 (9.2)	447 (6.1)	447 (6.0)	472 (6.3)	546 (7.2)	498 (6.5)	505 (6.5)	462 (5.9)	424 (5.4)	305 (3.8)	571 (7.1)	666 (8.3)
Kawasaki syndrome	NA	NA	NA	NA	9 (0.1)	19 (0.3)	9 (0.1)	11 (0.2)	11 (0.2)	11 (0.1)	12 (0.2)	10 (0.1)	8 (0.1)	7 (0.1)	7 (0.1)	10 (0.1)	19 (0.2)	6 (0.1)	4 (0.1)	2 (*)
Lead Poisoning Adults Aged 18 and older[10]	NA	NA	NA	NA	NA	83	44	177	239	278	235	238	505	545	440	481	512	611	314	285
Children *Aged 0-5 years*[11]	NA	1,146 (224.2)	927 (176.7)	1,152 (214.0)	1,208 (219.0)	977 (172.9)	747 (129.1)	833 (140.7)	619 (99.1)	635 (104.8)	742 (122.5)	1,766 (291.5)	1,848 (305.1)	1,581 (261.0)	1,275 (210.5)	1,050 (173.3)	948 (156.5)	771 (127.3)	678 (103.9)	535 (82.0)
Children *Aged 6-17 years*[11]	NA	47 (4.0)	33 (2.8)	43 (3.8)	76 (6.7)	66 (5.9)	46 (4.1)	57 (5.2)	43 (4.0)	58 (5.4)	61 (5.6)	144 (12.3)	130 (12.0)	125 (11.6)	103 (9.5)	97 (9.0)	114 (10.5)	123 (11.4)	137 (10.6)	118 (9.2)
Children *Aged 0-17 years*[11]	1,259 (72.0)	1,193 (70.9)	960 (56.8)	1,195 (71.1)	1,284 (76.2)	1,043 (62.1)	793 (46.9)	890 (52.9)	662 (38.8)	693 (41.1)	803 (47.6)	1,910 (113.2)	1,978 (117.3)	1,706 (101.1)	1,378 (81.7)	1,147 (68.0)	1,062 (63.0)	894 (53.0)	815 (42.0)	653 (33.7)
Legionellosis[12]	10 (0.1)	58 (0.8)	17 (0.2)	58 (0.8)	14 (0.2)	27 (0.4)	50 (0.7)	65 (0.9)	94 (1.3)	82 (1.1)	10 (0.1)	6 (0.1)	11 (0.1)	6 (0.1)	19 (0.2)	27 (0.3)	38 (0.5)	42 (0.5)	47 (0.6)	43 (0.5)
Leprosy (Hansen's disease)	29 (0.1)	31 (0.4)	46 (0.6)	29 (0.4)	25 (0.3)	19 (0.3)	3 (*)	23 (0.3)	18 (0.2)	16 (0.2)	16 (0.2)	16 (0.2)	13 (0.2)	13 (0.2)	5 (0.1)	11 (0.1)	9 (0.1)	10 (0.1)	7 (0.1)	15 (0.2)
Leptospirosis	0 (*)	1 (*)	1 (*)	0 (*)	1 (*)	0 (*)	0 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)	1 (*)
Listeriosis	NA	NA	NA	NA	NA	1 (*)	38 (0.5)	41 (0.6)	44 (0.6)	22 (0.3)	27 (0.4)	45 (0.6)	39 (0.5)	28 (0.4)	44 (0.6)	44 (0.6)	39 (0.5)	49 (0.6)	50 (0.6)	26 (0.3)
Lyme disease	NA	NA	NA	NA	24 (0.3)	108 (1.5)	157 (2.2)	107 (1.5)	94 (1.3)	140 (1.9)	116 (1.6)	214 (2.8)	98 (1.3)	467 (6.1)	409 (5.3)	196 (2.5)	250 (3.2)	168 (2.1)	214 (2.7)	95 (1.2)
Lymphogranuloma venereum	94 (1.3)	47 (0.7)	22 (0.3)	31 (0.4)	79 (1.1)	42 (0.6)	53 (0.7)	31 (0.4)	47 (0.6)	121 (1.6)	129 (1.7)	167 (2.2)	105 (1.4)	75 (1.0)	11 (0.1)	19 (0.2)	18 (0.2)	9 (0.1)	0 (*)	0 (*)
Malaria	70 (1.0)	45 (0.6)	46 (0.6)	64 (0.9)	29 (0.4)	27 (0.4)	94 (1.3)	99 (1.4)	114 (1.6)	133 (1.8)	169 (2.3)	143 (1.9)	104 (1.4)	222 (2.9)	272 (3.5)	307 (3.9)	241 (3.1)	237 (3.0)	229 (2.9)	251 (3.1)
Measles (rubeola)	49 (0.7)	72 (1.0)	113 (1.6)	80 (1.1)	930 (12.9)	469 (6.5)	57 (0.8)	135 (1.9)	1,108 (15.1)	1,909 (25.8)	68 (0.9)	19 (0.3)	15 (0.2)	5 (0.1)	11 (0.1)	13 (0.2)	0 (*)	3 (*)	13 (0.2)	7 (0.1)
Meningitis[7] Aseptic/viral	192 (2.7)	219 (3.1)	166 (2.3)	201 (2.8)	152 (2.1)	187 (2.6)	149 (2.0)	199 (2.7)	165 (2.3)	426 (5.8)	181 (2.4)	273 (3.6)	150 (2.0)	157 (2.1)	127 (1.6)	154 (2.0)	211 (2.7)	303 (3.8)	412 (5.1)	507 (6.3)
Haemophilus influenzae[13]	92 (1.3)	113 (1.6)	56 (0.8)	91 (1.3)	79 (1.1)	79 (1.1)	58 (0.8)	147 (2.0)	128 (1.7)	54 (0.7)	33 (0.4)	39 (0.5)	34 (0.4)	36 (0.5)	58 (0.8)	44 (0.6)	50 (0.6)	56 (0.7)	65 (0.8)	59 (0.7)
Meningo-coccal[14]	104 (1.5)	89 (1.2)	75 (1.0)	70 (1.0)	81 (1.1)	57 (0.8)	66 (0.9)	87 (1.2)	79 (1.1)	30 (0.4)	28 (0.4)	40 (0.5)	40 (0.5)	54 (0.7)	56 (0.7)	56 (0.7)	34 (0.4)	59 (0.7)	46 (0.6)	42 (0.5)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Other bacterial meningitides[13]	325 (4.6)	375 (5.2)	327 (4.6)	484 (6.7)	309 (4.3)	297 (4.1)	134 (1.8)	320 (4.4)	195 (2.7)	201 (2.7)	144 (1.9)	195 (2.6)	205 (2.7)	254 (3.3)	237 (3.1)	214 (2.7)	181 (2.3)	155 (2.0)	171 (2.1)	91 (1.1)
Mumps	47 (0.7)	37 (0.5)	46 (0.6)	32 (0.4)	17 (0.2)	40 (0.6)	104 (1.4)	23 (0.3)	65 (0.9)	14 (0.2)	12 (0.2)	2 (*)	12 (0.2)	7 (0.1)	15 (0.2)	2 (*)	154 (2.0)	2 (*)	6 (0.1)	9 (0.1)
Pertussis	53 (0.7)	61 (0.9)	21 (0.3)	26 (0.4)	10 (0.1)	15 (0.2)	11 (0.2)	19 (0.3)	21 (0.3)	22 (0.3)	24 (0.3)	116 (1.5)	223 (2.9)	36 (0.5)	62 (0.8)	43 (0.6)	12 (0.2)	7 (0.1)	11 (0.1)	6 (0.1)
Poliomyelitis	2 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)
Psittacosis	3 (*)	8 (0.1)	3 (*)	6 (*)	0 (*)	2 (*)	0 (*)	1 (*)	1 (*)	0 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)	0 (*)	0 (*)
Rabies in animals[15]	0	0	0	0	0	0	1	0	0	2	41	53	16	5	3	2	1	10	18	38
Rickettsialpox	0 (*)	2 (*)	2 (*)	4 (0.1)	3 (*)	4 (0.1)	6 (0.1)	10 (0.1)	4 (0.1)	1 (*)	0 (*)	0 (*)	1 (*)	0 (*)	1 (*)	1 (*)	0 (*)	1 (*)	2 (*)	15 (0.2)
Rocky Mountain spotted fever	3 (*)	3 (*)	2 (*)	6 (0.1)	0 (*)	6 (0.1)	1 (*)	3 (*)	4 (0.1)	1 (*)	7 (0.1)	1 (*)	3 (*)	6 (0.1)	20 (0.3)	6 (0.1)	1 (*)	0 (*)	3 (*)	1 (*)
Rubella (German measles)	36 (0.5)	87 (1.2)	111 (1.6)	184 (2.6)	5 (0.1)	3 (*)	7 (0.1)	16 (0.2)	4 (0.1)	2 (*)	0 (*)	22 0.3	1 (*)	6 (0.1)	5 (0.1)	25 (0.3)	17 (0.2)	6 (0.1)	9 (0.1)	6 (0.1)
Rubella syndrome, congenital	NA	NA	0 (*)	0 (*)	8 (0.1)	0 (*)	2 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)	0 (*)	2 (*)	3 (*)	0 (*)	3 (*)	0 (*)
Salmonella paratyphi A and B	12 (0.2)	6 (0.1)	5 (0.1)	2 (*)	2 (*)	1 (*)	0 (*)	2 (*)	4 (0.1)	3 (*)	6 (0.1)	8 (0.1)	7 (0.1)	NA	NA	NA	NA	NA	NA	NA
Salmonellosis, nontyphoidal[16]	1,753 (24.6)	2,829 (39.6)	1,800 (25.1)	2,642 (36.7)	2,770 (38.4)	1,801 (24.9)	1,687 (23.0)	2,020 (27.7)	1,688 (23.1)	1,706 (23.1)	1,839 (24.7)	2,015 (26.8)	1,890 (24.9)	2,172 (28.4)	1,929 (25.0)	1,772 (22.7)	1,753 (22.3)	1,508 (19.0)	1,212 (15.1)	1,355 (16.9)
Scarlet fever	583 (8.2)	454 (6.4)	427 (6.0)	409 (5.7)	NA	206 (2.8)	81 (1.1)	104 (1.4)	175 (2.4)	325 (4.4)	258 (3.5)	266 (3.5)	335 (4.4)	211 (2.8)	164 (2.1)	218 (2.8)	524 (6.7)	310 (3.9)	350 (4.4)	481 (6.0)
Shigellosis	684 (9.6)	1,238 (17.3)	350 (4.9)	810 (11.3)	663 (9.2)	1,771 (24.4)	482 (6.6)	354 (4.9)	673 (9.2)	428 (5.8)	760 (10.2)	677 (9.0)	1,007 (13.3)	848 (11.1)	633 (8.2)	945 (12.1)	684 (8.7)	366 (4.6)	942 (11.8)	417 (5.2)
Streptococcus group A invasive														131 (1.7)	172 (2.2)	205 (2.6)	142 (1.8)	116 (1.5)	136 (1.7)	168 (2.1)
Streptococcus group B invasive																				350 (4.4)
Streptococcus pneumoniae[17]																				1,017 (12.7)
Invasive penicillin-resistant[18] (% resistant of total blood isolates)															307 (14.8% of 2,077)	297 (16.0% of 1,857)	338 (19.8% of 1,709)	290 (23.0% of 1,261)	383 (25.8% of 1,482)	283 (29.5% of 958)
Syphilis Primary and secondary	2,602 (36.5)	2,473 (34.6)	2,285 (31.9)	2,157 (30.0)	2,112 (29.2)	4,542 (62.7)	5,042 (69.3)	4,362 (59.8)	4,265 (58.2)	3,133 (42.4)	2,246 (30.1)	1,129 (15.0)	626 (8.2)	362 (4.7)	138 (1.8)	97 (1.2)	82 (1.0)	130 (1.6)	117 (1.5)	282 (3.5)
Early latent *(<1 year)*	1,908 (26.8)	1,888 (26.4)	2,027 (28.3)	2,292 (31.8)	2,005 (27.8)	3,501 (48.3)	4,515 (62.1)	5,847 (80.1)	7,485 (102.2)	6,769 (91.6)	5,373 (72.1)	3,747 (49.8)	2,360 (31.1)	1,944 (25.4)	1,077 (13.9)	666 (8.5)	644 (8.2)	659 (8.3)	447 (5.6)	548 (6.8)
Late latent	2,719 (38.2)	2,413 (33.8)	2,441 (34.0)	2,440 (33.9)	2,291 (31.7)	2,287 (31.6)	2,433 (33.5)	2,522 (34.6)	3,394 (46.3)	4,993 (67.6)	4,905 (65.8)	4,929 (65.5)	4,618 (60.8)	5,249 (68.5)	4,455 (57.7)	4,102 (52.6)	3,859 (49.1)	2,893 (36.4)	2,097 (26.2)	2,437 (30.4)
Congenital[19]	16 (14.4)	18 (16.0)	43 (37.9)	41 (34.6)	33 (27.0)	126 (98.9)	356 (269.2)	1,017 (738.7)	1,051 (752.7)	933 (675.4)	915 (672.8)	671 (502.3)	437 (326.9)	275 (209.9)	267 (210.4)	79 (64.2)	48 (38.6)	49 (39.6)	28 (22.3)	34 (27.4)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Tetanus	4 (0.1)	4 (0.1)	1 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)	2 (*)	0 (*)	0 (*)	2 (*)	0 (*)	0 (*)	0 (*)	1 (*)	1 (*)
Toxic shock syndrome	NA	3 (*)	0 (*)	2 (*)	1 (*)	7 (0.1)	8 (0.1)	4 (0.1)	7 (0.1)	2 (*)	0 (*)	2 (*)	0 (*)	4 (0.1)	4 (0.1)	4 (0.1)	0 (*)	2 (*)	3 (*)	4 (0.1)
Trichinosis	6 (0.1)	4 (0.1)	3 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)	0 (*)	0 (*)	0 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)
Tuberculosis [20]	1,594 (22.4)	1,651 (23.1)	1,629 (22.7)	1,843 (25.6)	2,223 (30.8)	2,197 (30.3)	2,317 (31.9)	2,545 (34.9)	3,520 (48.1)	3,673 (49.7)	3,811 (51.1)	3,235 (43.0)	2,995 (39.5)	2,445 (31.9)	2,053 (26.6)	1,730 (22.2)	1,558 (19.8)	1,460 (18.4)	1,332 (16.6)	1,261 (15.7)
Tularemia	0 (*)	0 (*)	2 (*)	1 (*)	0 (*)	0 (*)	1 (*)	2 (*)	0 (*)	0 (*)	0 (*)	0 (*)	1 (*)	0 (*)	1 (*)	0 (*)	1 (*)	0 (*)	0 (*)	0 (*)
Typhoid fever	37 (0.5)	47 (0.7)	26 (0.4)	34 (0.5)	11 (0.2)	29 (0.4)	55 (0.8)	56 (0.7)	84 (1.1)	79 (1.1)	50 (0.7)	102 (1.4)	79 (1.0)	66 (0.9)	64 (0.8)	49 (0.6)	55 (0.7)	49 (0.6)	56 (0.7)	49 (0.6)
Urethritis [21] non-gonococcal	25,836 (362.8)	21,981 (307.6)	19,998 (278.8)	21,630 (300.5)	20,171 (279.3)	17,801 (245.6)	16,501 (226.9)	15,711 (215.3)	16,589 (226.5)	17,561 (237.7)	16,902 (226.7)	15,064 (200.3)	14,605 (192.4)	13,419 (175.2)	11,495 (148.8)	10,602 (136.0)	11,580 (147.2)	9,236 (116.4)	7,672 (95.8)	8,660 (108.1)
Vibrio species, non cholera																			3 (*)	4 (0.1)
Visceral larva migrans	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	2 (*)	1 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)	0 (*)
Window falls Children aged 16 and younger	103 (6.3)	96 (5.9)	126 (7.7)	105 (6.5)	114 (7.0)	92 (5.7)	64 (4.0)	66 (4.1)	44 (2.8)	62 (3.8)	49 (3.0)	48 (2.9)	41 (2.4)	46 (2.7)	33 (1.9)	23 (1.3)	34 (1.9)	23 (1.3)	15 (0.2)	5 (0.1)
Yersiniosis	NA	NA	NA	NA	NA	18 (0.2)	48 (0.7)	46 (0.6)	33 (0.5)	41 (0.6)	51 (0.7)	45 (0.6)	49 (0.6)	36 (0.5)	42 (0.5)	54 (0.7)	27 (0.3)	21 (0.3)	23 (0.8)	14 (0.3)
West Nile viral disease [22]																		46 (0.6)	14 (0.2)	7 (0.1)

Notes

1 Diphtheria, glanders, hantavirus disease, plague, human rabies, smallpox, trachoma, and yellow fever were required to be reported between 1982 and 2001 but are not listed as no cases were reported during the time period indicated. Beginning on December 12, 1994, glanders and smallpox, in addition to chickenpox, dengue, schistosomiasis, streptococcal sore throat, and certain diseases of the newborn, including conjunctivitis, diarrhea, impetigo, and thrush, were not required to be reported; glanders and smallpox, however, were re-added to the health code in November 2001 and are now required to be reported. As of July 28, 2001, Reye's syndrome, typhus, and histoplasmosis were not required to be reported. Recent reporting requirements emphasize increasing public health concern about emerging infectious diseases. The reporting of immunizations administered to children aged 7 years and younger became mandatory for providers on January 1, 1997. Exposure to rabies became required to be reported on January 19, 1999. *Vibrio* species, non-cholera (including *parahaemolyticus* and *vulnificus*) became required to be reported on August 9, 1999. HIV reporting became mandatory on June 1, 2000 (see note 2). Effective August 30, 2000, group B streptococcal invasive disease and *Streptococcus pneumoniae* invasive disease (both drug-resistant and drug-sensitive) were required to be reported. On July 28, 2001, acute arboviral infections, (including dengue), transmissible spongiform encephalopathies, pesticide poisonings, Q fever, and smallpox were required to be reported. Glanders, melioidosis, staphylococcal enterotoxin B, and viral hemorrhagic fever were required to be reported starting on November 20, 2001. Data are presented only for diseases required to be reported for an entire year; therefore, diseases that were mandated to be reported during 2001 are not presented in this table. A current listing of all diseases and conditions required to be reported in NYC appears on page 18. Rates are per 100,000 population unless noted otherwise and are based on census data for each decade, with intercensal years estimated through 2000. Rates for 2001 were calculated using the 2000 population. The population of NYC in 1980 was 7,071,639; in 1990, it was 7,322,564; and in 2000, it was 8,008,278. Gray areas indicate years in which diseases were either not yet recognized or not yet required to be reported. Variations in data between this report and previous reports, including other publications of the New York City Department of Health and Mental Hygiene (NYC DOHMH), may be due to several factors including reporting delays, census data availability, corrections, and data processing refinements (e.g., the removal of duplicate reports).

2 World Trade Center (WTC) Deaths data are preliminary, based on certificates for decedents of the WTC disaster on September 11, 2001, filed with the Office of Vital Records through July 18, 2002.

3 Surveillance began in 1981 for a newly recognized constellation of diseases later termed acquired immunodeficiency syndrome (AIDS). A case definition was developed by the CDC in 1982, and revised in 1985, 1987, and 1993. These data are presented by date of AIDS diagnosis and reported through December 31, 2001. The delay in reporting from date of diagnosis to date of report averages approximately 9 months. The data on AIDS cases diagnosed each year continue to be revised as previously diagnosed cases are reported. On June 1, 2000, the New York State Department of Health (NYS DOH) required that newly diagnosed HIV infections, HIV-related illness with < 500 CD4+ lymphocytes/µL or a detectable viral load, and information on known contacts be reported.

4 In 2000, the 5 most frequently reported bites were by dogs (5,515), cats (1,372), humans (1,191), rats (107), and mice (75). In 2001, again, the 5 most frequently reported bites were by dogs (5,300), cats (1,195), humans (1,191), rats (110), and mice (60).

5 In Fall 2001, 2 probable cases of anthrax (both cutaneous) were identified in addition to the 5 confirmed cases (4 cutaneous, 1 inhalational) that appear in the table. In addition to these 7 cases among NYC residents, one other case of probable cutaneous anthrax was identified in a person who was exposed in NYC, but resides elsewhere. The case definitions for anthrax are described in the CDC's *Morbidity and Mortality Weekly Report (MMWR)* of October 19, 2001, 50(41);889-893.

6 Men are currently tested for chlamydia with much less frequency than women. In 2000, among cases where gender was known, 3,377 cases (89/100,000) were reported among males; 22,663 cases (537.8/100,000) were reported among females. In 2001, among cases where gender was known, 4,477 cases (118/100,000) were reported among males; 25,118 cases (596.1/100,000) were reported among females.

7 Increased case-reporting of encephalitis and viral meningitis starting in 1999 is a result of active surveillance for West Nile viral disease during the adult mosquito season (June–September). Meningitis and encephalitis caused by West Nile virus appear under West Nile viral disease.

8 Active physician-based surveillance of hemolytic uremic syndrome began in 1998 among pediatric nephrologists, and may explain the increase in cases starting in 1999.

9 Surveillance case definitions for viral hepatitis A (HAV) and viral hepatitis B (HBV) have evolved as improvements have occurred in laboratory-based diagnostic testing. Prior to 1977, all cases were clinically defined. Between 1977 and 1986, HAV was defined as hepatitis B surface antigen (HBsAg)-negative and HBV was defined as HBsAg-positive, with both additionally requiring compatible clinical presentations. Since 1987, HAV has been defined as IgM antibody-positive to HAV (IgM anti-HAV). From 1987 to 1990, HBV was defined as IgM-positive to hepatitis B core antigen (IgM anti-HBc) or HBsAg-positive. Since 1991, HBV has been defined as IgM HBc-positive or HBsAg-positive with elevated liver function tests (> 2.5 times the upper limit of normal). Hepatitis C is not listed in this table as both NYC and national data have been unreliable due to the lack of resources necessary to determine whether a laboratory report represents acute, chronic, or resolved infection; repeated testing of a person previously reported; or a false-positive test result.

10 Adult lead poisoning data include only adult cases newly identified with blood lead levels ≥ 20 mcg/dL. Previously reported data included both old and newly-identified cases. Population-based rates are not calculated, as reported adult cases include cases of persons who work in NYC but live elsewhere.

11 The case action definition (environmental intervention blood lead level — EIBLL) of childhood lead poisoning was defined as a blood lead level ≥ 30 mcg/dL from 1981 to 1985, ≥ 25 mcg/dL from 1986 to 1992, and ≥ 20 mcg/dL from 1993 to June 30, 1999. Since July 1, 1999, the EIBLL has been defined as either (a) a single venous blood lead level ≥ 20 mcg/dL or (b) two blood lead levels 15–19 mcg/dL that were drawn at least 3 months apart. Currently, children with blood lead levels greater than or equal to the EIBLL receive environmental intervention (assessment, monitoring and enforcement). Effective 1993, New York State (NYS) law mandates (a) blood lead testing of one and two year old children and (b) assessment of children aged 6 months to < 6 years and testing of those children at high risk. Since 1994, NYS has also mandated reporting of all blood lead tests.

12 Prior to 1991, suspected cases of legionellosis (those with a single immunofluorescent antibody titer of 1:256) were included in surveillance data. Beginning in 1991, only confirmed cases of legionellosis were included in surveillance data. Confirmed cases include: those requiring culture isolation from respiratory secretions, lung tissue, or sterile sites; a ≥ 4-fold rise in immunofluorescent antibody titers to 128 or higher against *Legionella pneumophila* serogroup 1; positive direct fluorescence antibody testing of respiratory secretions or tissue; or the presence of *L. pneumophila* serogroup 1 antigen in urine.

13 From 1974 to 1981, *Haemophilus influenzae* was reported as part of the category "other bacterial meningitides". Invasive disease due to *Haemophilus influenzae* comprises several clinical syndromes, including meningitis, bacteremia, epiglottitis, and pneumonia.

14 Meningococcal disease includes meningitis, meningococcemia, or other sterile sites.

15 On March 11, 1992, a raccoon found on a Staten Island street corner tested positive for rabies. Before this, rabies had not been found in any NYC animal, other than bats, since 3 dogs were reported to have rabies in 1954. The discovery of this rabid raccoon marked the arrival of the mid-Atlantic raccoon rabies epizootic in NYC, prompting the NYC DOH to declare all 5 NYC boroughs enzootic for rabies. Additionally, the NYC DOH changed its recommendations to providers regarding the prophylactic management of persons potentially exposed to rabies. The 38 cases confirmed in 2001 are comprised of 29 raccoons, 4 bats, 4 skunks, and one cat. Most *human* rabies cases acquired in the United States (24 of 26 cases reported since 1990) have been associated with bats. There has not been a case of human rabies acquired in NYC since 1944.

16 After 1994, all cases of nontyphoidal salmonellosis are counted together.

17 Each month, microbiology laboratories in acute-care facilities report the number of patients who had *Streptococcus pneumoniae (S. pneumoniae)* isolated from a sterile site (e.g., blood, cerebrospinal fluid, synovial, peritoneal, pleural, or thoracic fluid).

18 Drug-resistant pneumococcus data presented here include patients with penicillin resistant *S. pneumoniae* (defined by the National Committee for Clinical Laboratory Standards as penicillin MIC ≥ 0.12) isolated from blood by NYC hospital laboratories. Data regarding patient residence are not currently collected; thus, cases may include patients residing outside of NYC. Only patients with **blood** isolates of *S. pneumoniae* are used in calculating both the numerator and the denominator of percent resistant.

19 Before 1989, congenital syphilis was defined according to a complex set of clinical and serologic features known as the Kaufman criteria, which, while clinically useful, undercounted cases when used for surveillance by not clearly accounting for asymptomatic infants or stillbirths. The recognition of this problem prompted the CDC in 1988 to develop a new surveillance definition in response to the large increase in congenital syphilis that occurred in the mid-1980s. The surveillance definition is simpler and more sensitive, defining as cases all births (live or stillborn) to women with untreated or inadequately treated syphilis.

20 The case definition of tuberculosis (TB) was revised in 1978 to include persons with confirmed TB who were lost to follow-up for more than 12 months and diagnosed with TB for a second time. Prior to 1978, only the initial diagnosis of these cases was counted. Public health law mandates that health care providers report two groups of patients to the NYC DOHMH. All suspected and confirmed TB cases which have any of the following characteristics must be reported: a smear (from any anatomic site) positive for acid-fast bacilli (AFB); a nucleic acid amplification test (e.g., Amplicor®, Genprobe®)* result suggesting *Mycobacterium tuberculosis*; a culture positive for *Mycobacterium tuberculosis*; or those started on two or more anti-tuberculosis medications for treatment of suspected or confirmed active tuberculosis. In addition, children younger than 5 years with positive Mantoux tuberculin skin tests must be reported. Cases of suspected and confirmed tuberculosis should be reported within 24 hours of the time the diagnosis is first suspected. The initial case report should not be delayed pending confirmation by a rapid diagnostic laboratory test. To report cases, use the TB Case Report (TB76) form. Mycobacteriology and pathology laboratories are required to report to the NYC DOHMH any bacteriologic findings which suggest or confirm tuberculosis: AFB-positive smears; cultures positive for *Mycobacterium tuberculosis*; rapid diagnostic results that identify *Mycobacterium tuberculosis*; results of susceptibility tests performed on *Mycobacterium tuberculosis* cultures; pathology findings consistent with tuberculosis, including the presence of AFB and granulomata. As of January 1, 2001 mycobacteriology and pathology laboratories are required to forward the initial *M. tuberculosis* culture or subculture from each new patient to the NYC Bureau of Laboratories within 24 hours of identification.

* Product names are provided for identification purposes only; their use does not imply endorsement by the NYC DOHMH.

21 Women are diagnosed with non-gonococcal urethritis much less frequently than men. In 2001, of those reported cases of known gender, 6 cases were among women (0.14/100,000); 8650 cases (228/100,000) were among men.

22 In the 1999 West Nile viral disease data, both hospitalized cases (n=44) and milder illness cases (n=2) are included. Beginning in 2000, only hospitalized cases of West Nile encephalitis or aseptic meningitis are included.

Diseases and Conditions That Must Be Reported to the New York City Department of Health and Mental Hygiene

Reportable Diseases

During business hours call
1-866-NYC-DOH1 / 1-866-692-3641

After business hours call the Poison Control Center
(212) POI-SONS / (212) 764-7667

HIV/AIDS

- Newly diagnosed HIV infection (positive Western blot HIV antibody test)
- HIV-related illness (<500 CD4+ lymphocytes/µl or a detectable viral load)
- Acquired immunodeficiency syndrome (AIDS)
- Contact information and request for pick up of completed *New York State Department of Health Provider Report Form.*

Sexually Transmitted Diseases

(212) 788-4423
FAX (212) 788-4431
Chancroid
Chlamydia
Gonorrhea
Granuloma inguinale (Donovanosis)
Lymphogranuloma venereum
Syphilis, including congenital syphilis
Urethritis, non-gonococcal

Tuberculosis

(212) 788-4163
FAX (212) 788-4179

- Positive AFB smears
- Positive M. TB cultures
- Pathology findings consistent with TB
- Start of TB treatment with 2 or more anti-TB drugs
- Positive Mantoux tuberculin skin tests in children younger than 5 years

Vaccine-Preventable Diseases

and adverse events related to immunizations
(212) 676-2284
FAX (212) 676-2300

➤ Diphtheria
➤ Measles
Mumps[1]
Pertussis[1]
➤ Poliomyelitis
Rubella, including congenital rubella syndrome[1]
Tetanus

Other Reportable Diseases

(212) 788-9830
FAX (212) 788-4268
Amebiasis[1,2]
➤ Anthrax
➤ Arboviral infections, acute
Babesiosis
➤ Botulism
➤ Brucellosis
Campylobacteriosis[1,2]
➤ Cholera
Creutzfeldt-Jakob disease
Cryptosporidiosis[1,2]
Cyclosporiasis[1,2]
Ehrlichiosis
Encephalitis[3]
Escherichia coli O157:H7[1,2]
Giardiasis[1,2]
➤ Glanders
Haemophilus influenzae (invasive disease)[1]
➤ Hantavirus disease
Hemolytic uremic syndrome
Hepatitis A[1,2]; B; C; non-A, non-B
Hepatitis B cases in pregnant women must be reported by faxing the IMM5 form to (718) 520-6246. For questions, call (718) 520-8245
Hospital-associated infections[4]
Kawasaki syndrome
Legionellosis
Leprosy (Hansen's disease)
Leptospirosis
Listeriosis
Lyme disease
Malaria
➤ Melioidosis
Meningitis
Aseptic/viral,[3] ➤ Meningococcal,[1] *Haemophilus influenzae*,[1] and other bacterial meningitides
➤ Meningococcemia
➤ Plague
Psittacosis
➤ Q fever
➤ Rabies, and exposure to rabies
Rickettsialpox
Rocky Mountain spotted fever
Salmonellosis[1,2]
Scarlet fever
➤ Smallpox
Shigellosis[1,2]
➤ Staphylococcal enterotoxin B
Streptococcal infections, groups A and B (invasive disease)
Streptococcus pneumoniae (invasive disease, both sensitive and resistant strains)
Toxic shock syndrome
Trachoma
Transmissible spongiform encephalopathies
Trichinosis
➤ Tularemia
Typhoid fever[1,2]
Vibrio species, non-cholera (including parahaemolyticus and vulnificus)
➤ Viral hemorrhagic fever
Visceral larva migrans
➤ Yellow fever
Yersiniosis[1,2]

Immunizations

Immunizations administered to children aged 7 years and younger must be reported to the Department. For information on how to report, please consult the website of the City Immunization Registry at nyc.gov/health/cir or call **(212) 676-2323.**

Injuries

Animal Bites

(212) 676-2483
FAX (212) 676-2111

➤ Animal bites must be reported immediately by telephone; the Report Animal Bite Card 31-BAA must be sent to the Department within 24 hours.
➤ Exposure to rabies

Falls

From windows of multiple dwellings by children aged 16 and younger
FAX (212) 442-2629

Poisonings

(212) POI-SONS / (212) 764-7667
(800) 222-1222

Poisonings by drugs or other toxic agents (including pesticides)
FAX (212) 447-8223

Lead Poisoning[5]

- **Children Aged 17 and Younger**
  FAX (212) 676-6326
- **Adults**
  FAX (212) 788-4299

Other Heavy Metals

(Mercury, Arsenic, Cadmium)
FAX (212) 788-4299

Food Poisoning[1,2]

➤ In a group of 3 or more persons
FAX (212) 442-3378

Vital Event Certificates

All births, deaths, and spontaneous and induced terminations of pregnancy must be reported to the Department using appropriate New York City certificates.

To obtain these certificates call **(212) 788-4520**.

Notes

1. Report *immediately by telephone* a suspected case in a day care, health care, correctional, or homeless facility.
2. Report *immediately by telephone* a suspected case in a food handler.
3. **Suspected West Nile Viral Disease:** During the mosquito season (June through October), *report immediately by telephone or fax* all cases of viral encephalitis in persons of any age and all cases of aseptic meningitis among persons aged 17 and older (at other times, report routinely). Guillain-Barré syndrome in persons of any age, especially if associated with fever or altered mental status, should also be reported *immediately by telephone or fax* during the mosquito season.
4. Any nonsocomial outbreak or increased incidence of hospital-associated infection must be reported to both the NYC DOHMH by calling (212) 788-9830 and the NYS DOH by calling (518) 473-4439 [See Health Code Section 11.03, 10 NYCRR Part 2 and 10 NYCRR Section 405.11(c)].
5. Blood lead levels of 10 mcg/dL or greater should be reported *immediately.*

Outbreaks

Section 11.03(b) of the New York City Health Code requires the *immediate reporting by telephone* of a suspected outbreak among 3 or more persons of *any* disease or condition (whether it is listed here or not), and of any unusual manifestation of disease in an individual.

➤ While prompt reporting of all diseases and conditions is important, *immediate reporting by telephone of* ➤ **diseases marked with an arrow** can be especially critical in limiting additional morbidity.

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2002, Vol. 21

1. Vector-borne and zoonotic diseases in New York City — An update (June)
2. Contraception: The physician's role in preventing unintended pregnancy (June)

   CME Activity included
3. School admission requirements for the school year 2002-2003 (July)
4. Summary of reportable diseases and conditions 2000-2001

   Focus: Judicious use of antimicrobials (December)

   CME/CNE Activity included
5. Prevention and control of influenza and pneumonia (October)
6. Treating nicotine addiction (November)

2001, Vol. 20

1. Summary of reportable diseases and conditions, 1999 (March)

   Focus: Getting Older
2. Developmental delay in young children: Identification and intervention (June)

   CME Activity included
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   CME Activity included
2. Hepatitis C: Diagnosis, prevention, and control (July)

   CME Activity included
3. Testing and treatment for latent tuberculosis infection (October)

   CME Activity included

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S-2. School admission requirements for the school year 2000-2001 (August)

1999, Vol. 18

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2. Childhood lead poisoning (November)

Supplement

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2. Occupational disease (October)

Supplement

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1996, Vol. 15

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4. Summary of reportable diseases and conditions, 1995 (December)

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Supplements

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S-2. School admission requirements for September, 1996 (August)

1995, Vol. 14

1. Childhood lead poisoning (January–October)
2. School admission requirements for September, 1995 (April–June)
3. Preventive treatment for tuberculosis (July–September)
4. Summary of reportable diseases and conditions, 1994 (September–December)

Supplement

S-1. Invasive group A streptococcal infections: An update (June)

1994, Vol. 13

1. Asbestos: Common questions (January–February)
2. Hantavirus pulmonary syndrome: A briefing (October–April)
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S-1. Advisory on the potential for plague in New York City (October)

S-2. Dear colleague: Additions and deletions to the reportable diseases list (December)

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1. The revised AIDS case definition: a briefing (February)
2. Lesbian and gay health: We can help you find the answers to your questions (April)
3. STDs: Are you looking for them? (September)

For information on back issues to July 1982, call (212) 676-2142.

This and other issues (beginning with Vol. 17, No. 2) are available on the Health Department's Web site at nyc.gov/health under publications.

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Public Health Information, Services, and Referrals

AIDS/HIV–
AIDS Hotline . . . . . **(800) TALK-HIV**
Translation services available . . . . . **(800) 825-5448**
HIV/AIDS Surveillance . . . . . **(212) 442-3388**

CNAP (Contact Notification Assistance Program)
. . . . . **(212) 693-1419**
. . . . . **(888) 792-1711**
For people with HIV/AIDS and their care providers:
information and training about partner notification, assistance with notifying partners, and related counseling
HIV Counseling and Testing: *See* **STD Control**
HIV Resource Library . . . . . **(212) 447-2981**
HIV Training Institute . . . . . **(212) 693-0774**
Men of Color AIDS Prevention (MOCA)
. . . . . **(212) 676-1500**

Animal Bites . . . . . **(212) 676-2483**

Asthma–
Asthma Action Line . . . . Toll Free **(877) 278-4620**
. . . . . **(212) 788-4999**
. . . . . TTY/TDD **(212) 442-1802**
Childhood Asthma Initiative . . . . . **(212) 788-4703**

Birth Certificates . . . . . **(212) 788-4520**

Central Information and Complaints
. . . . . **(212) 442-9666**

Chief Medical Examiner . . . . . **(212) 447-2030**

Child Abuse Hotline –
General Public . . . . . **(800) 342-3720**
Mandated Reporters . . . . . **(800) 635-1522**

Child Health Clinics . . . . . **(212) 442-4951**

Child Health Plus . . . . . **(800) 522-5006**
Free or low-cost health insurance for children aged 19 and younger whose family income is above Medicaid eligibility

City Health Information . . . **(212) 676-2142**

Commissioner of Health . . . . . **(212) 788-5261**

Communications . . . . . **(212) 788-5290**
Community Relations Office . . . . **(212) 788-4735**
Press Office . . . . . **(212) 788-5290**

Community HealthWorks . . . . . **(212) 341-9815**

Bureau of Communicable Diseases–
Medical consultation, reporting information
. . . . . **(212) 788-9830**

Continuing Medical Education Program
. . . . . **(212) 788-5716**

Day Camps and Recreation . . . **(212) 442-2630**

Day Care . . . . . **(212) 676-2444**

Death Certificates . . . . . **(212) 788-4520**

Dog Licenses . . . . . **(212) 676-2100**

Domestic Violence . . . . . **(212) 788-9819**
New York City Hotline **(800) 621-HOPE**
(800) 621-4673

Foodborne Illness . . . . . **(212) 442-3372**

Gay and Lesbian Health . . . . . **(212) 676-1500**

General Counsel's Office . . . . . **(212) 788-5025**

Bureau of Immunizations –
Immunization Hotline. . . . . **(212) 676-2273**
General information, including location and hours of walk-in clinics and availability of influenza vaccination services
Immunization Registry. . . . . **(212) 676-2323**
To report and obtain information on vaccinations administered to children aged 7 years and younger
Immunization Referral Hotline . . . **(800) 325-2445**
Spanish **(800) 945-6466**
24-hour-a-day referrals for children to neighborhood physicians and clinics; translation services available
Case reporting . . . . . **(212) 676-2284**
Medical consultation. . . . . **(212) 676-2264**
Perinatal Hepatitis B
Prevention Program . . . . . **(718) 520-8245**
Other inquiries . . . . . **(212) 676-2259**

Lead Poisoning Prevention –

Children
Information and consultation hotline
. . . . . **(212) BAN-LEAD**
. . . . . **(212) 226-5323**
Information and reporting . . . . . **(212) 676- 6158**

Adults
Information and reporting . . . . . **(212) 788-4290**

Literature Request Line . . . . . **(212) 788-5294**

Maternal, Infant, and Reproductive Health Program . . . . . **(212) 442-1740**

Mental Health Information. . . . . **(800) LifeNet**
. . . . . **(800) 543-3638**
Free, confidential crisis, information, and referral network for emotional and substance abuse problems

Minority Health . . . . . **(212) 676-2900**

Parasitic Disease Surveillance Unit
. . . . . **(212) 788-4728**
Cryptosporidiosis, Cyclosporiasis, Giardiasis

Pest Control . . . . . **(212) 442-9666**

The New York City Poison Control Center (24 hours a day) –
Translation services available in more than 140 languages
(212) POI-SONS
(212) 764-7667
Spanish. . . . . **(212) VEN-ENOS**
(212) 836-3667
TTY/TDD. . . . . **(212) 689-9014**

Quit Yet? New York Smokers' Quitline
. . . . . **(888) 609-6292**

Rabies Information–
Animals. . . . . **(212) 676-2483**
Information on confinement and observation, laboratory testing
Human prophylaxis . . . . . **(212) 788-9830**

Rat Bites . . . . . **(212) 676-2483**

School Health and Admission Requirements
. . . . . **(212) 676-2500**

Bureau of Sexually Transmitted Disease (STD) Prevention and Control–
STD information . . . . . **(212) 788-4423**
For providers: *medical consultation and treatment guidelines, assistance with reporting requirements and forms, and information on patient history from the Syphilis and Reactor Registry*
For the general public: *a hotline to answer questions about STDs, locations and hours of clinics, and how to obtain statistical reports and educational materials and presentations.*

STD Clinics/HIV Counseling and Testing Sites:
Free, confidential STD exams and treatment, confidential or anonymous HIV counseling and testing (parental consent, insurance, proof of citizenship not required.) Some clinics open Saturdays — call (212) 788-4423 or the numbers below for days and hours.

Brooklyn
Bedford-Stuyvesant *(HIV only)* . . **(718) 574-2482**
Crown Heights . . . . . **(718) 735-0580**
Williamsburg *(HIV only)* . . . . . **(718) 387-1594**
Fort Greene . . . . . **(718) 643-4133**
Bronx
Morrisania. . . . . **(718) 901-6564**
Manhattan
Central Harlem . . . . . **(212) 690-1760**
Chelsea . . . . . **(212) 239-1718**
East Harlem . . . . . **(212) 360-5934**
Riverside. . . . . **(212) 865-7757**
Queens
Corona . . . . . **(718) 476-7815**
Jamaica . . . . . **(718) 262-5570**
Staten Island
St. George . . . . . **(718) 983-4513**
. . . . . **(718) 983-4533**

Bureau of Tuberculosis Control –
Directly-observed therapy . . . . . **(212) 442-9777**
Assistance in arranging a program for your patient

Education and training . . . . . **(212) 442-9968**
For questions about TB and to obtain publications

TB Hotline for Physicians . . . . . **(212) 788-4162**
To report a suspected or confirmed case or to obtain information on the treatment and drug-susceptibility of your patient

Homeless Services . . . . . **(212) 442-9780**
. . . . . *after August* **(212) 442-9988**
Assistance in placing your homeless TB patient

Chest Centers
Free, confidential, state-of-the-art care for patients with tuberculosis, their contacts, and other persons at risk for TB infection. Some centers open on Saturdays and on late nights. Call for hours. Phone numbers may change; call (212) 442-9968 for updated numbers.

Bronx/Staten Island Network
Morrisania . . . . . **(718) 901-6536/6538**
Richmond . . . . . **(718) 420-1028**
Brooklyn Network
Bedford . . . . . **(718) 574-2462/2463**
Brownsville . . . . . **(718) 495-8281**
Fort Greene . . . . . **(718) 643-8357/6551**
Manhattan Network
Chelsea . . . . . **(212) 239-1713/1757**
Washington Heights . . . . . **(212) 368-4800**
Queens Network
Corona . . . . . **(718) 476-7635/36**
Far Rockaway . . . . . **(718) 474-2100/2101**

Tobacco Control Program . . . . . **(212) 676-2140**

Veterinary Public Health Services
. . . . . **(212) 676-2120**

Vital Statistics Data . . . . . **(212) 788-4575**

West Nile Virus Automated Information Line
. . . . . **(877) WNV-4692**
. . . . . **(877) 968-4692**

Window Falls Prevention Program
. . . . . **(212) 676-2162**

Women's Healthline . . . **(212) or (718) 230-1111**
TTY/TDD **(212) 442-1802**
Translation services available in more than 140 languages

Other Resources

Streptococcus Pneumoniae:
Active Bacterial Core Surveillance (ABCs) Report
Emerging Infections Program Network
Streptococcus pneumoniae, 2000
cdc.gov/ncidod/dbmd/abcs/survreports/spneu00.pdf

Otitis Media
Appropriate Use of Antibiotics for URIs in Children: Part I. Otitis Media and Acute Sinusitis
aafp.org/afp/981001ap/dowell.html

Judicious Use of Antibiotics — Otitis Media
health.state.ny.us/nysdoh/antibiotic/antibiotic

Sexually Transmitted Diseases
American College of Physicians/American Society of Internal Medicine: Resistant Sexually Transmitted Diseases
acponline.org/ear/vas2002/std.htm

New York City DOHMH — Region II STD HIV Prevention Training Center
nyc.gov/html/doh/html/std/ptcc5.html

Tuberculosis:
Centers for Disease Control and Prevention, Division of Tuberculosis Elimination
cdc.gov/nchstp/tb/

Tuberculosis Medical Fact Sheets — Section 4: Multi-drug Resistance in Tuberculosis
nyc.gov/html/doh/html/tb/tbfs.html

The NYC DOHMH Chest Center names, locations, telephone numbers and days of operation, which include Saturdays, are listed below:

Chelsea:
303 Ninth Avenue
(212) 239-1713
Mon–Fri, 2nd and 4th Saturdays of the month

Washington Heights:
600 West 168th Street
(212) 368-4500
Mon–Fri

Richmond:
51 Stuyvesant Place
(718) 420-1028
Monday–Friday

Corona:
34-33 Junction Blvd.
(718) 476-7635/36
Monday–Saturday

Bushwick:
335 Central Avenue
(718) 573-4886
Monday–Friday

Fort Greene:
295 Flatbush Avenue Extension
(718) 643-8357/6551
Monday–Saturday

Morrisania:
1309 Fulton Avenue
(718) 901-6536
Monday–Saturday

Bedford:
485 Throop Avenue
(718) 574-2462
Monday–Friday, 1st Saturday of the month

Brownsville:
259 Bristol Street
(718) 495-7256
Monday–Friday

Far Rockaway:
67-10 Rockaway Beach Blvd.
(718) 474-2100
Monday and Friday

General Resources for Antimicrobial Resistance

American College of Physicians/American Society of Internal Medicine:
Infectious Diseases — Summaries from Annual Sessions
acponline.org/ear/infect_dis.htm

Centers for Disease Control and Prevention, Antimicrobial Resistance Homepage
cdc.gov/drugresistance/

Centers for Disease Control and Prevention, Antimicrobial Resistance and Antibiotic Resistance Fact Sheets
cdc.gov/drugresistance/factsheets/index.htm

Centers for Disease Control and Prevention, Promoting Appropriate Antibiotic Use in the Community
cdc.gov/drugresistance/community/

National Institutes of Health's Fact Sheet: Antimicrobial Resistance
niaid.nih.gov/factsheets/antimicro.htm

Oregon Public Health Services: Acute and Communicable Diseases Program
ohd.hr.state.or.us/acd/antibiotics/princip.htm

Alliance for the Prudent Use of Antibiotics: Practitioner Information
healthsci.tufts.edu/apua/practioners/healthcare.html

Preventing Antibiotic Resistance: Strategies and Models
cdnetwork.org/webcast_archives.htm

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CME/CNE Activity

This issue of *City Health Information*, including the continuing education activity, can be downloaded (but not for electronic response) in the publications section at nyc.gov/health.

Instructions

1. Read this issue of *City Health Information* for the correct answers to questions.
2. Complete all information on the response card, including your name, degree, mailing address, telephone number, and E-mail address.

   PLEASE WRITE CLEARLY.

3. Select your answers to the questions, and check the corresponding boxes on the response card provided. **To receive continuing education credit, you must answer four of the first five questions correctly.**
4. Return the response card or a photocopy of the card postmarked no later than May 31, 2003. Mail to CME/CNE Administrator NYC Department of Health and Mental Hygiene 161 William Street, 5th floor, CN-29C New York, NY 10038.

CME/CNE Activity Judicious Use of Antimcrobials

1. Which one of the following statements is FALSE?

- ❑ **A.** Steps that physicians can take to preserve antibiotic effectiveness include using an agent that will target the likely pathogen and adjusting treatment based on susceptibility test results.
- ❑ **B.** The most important risk factor for carriage of or infection with antibiotic-resistant *Streptococcus pneumoniae* is underlying chronic disease.
- ❑ **C.** Guidelines have recently been published on appropriate antimicrobial use for the management of upper respiratory tract infections in children and adults.
- ❑ **D.** Evidence indicates that antibiotic treatments for children have declined from 1989 through 2000.
- ❑ **E.** Empiric therapy for pneumococcal meningitis in New York City should include vancomycin.

2. Which one of the following statements regarding pneumococcal vaccines is FALSE?

- ❑ **A.** The 7-valent conjugate vaccine (PCV7) is effective against those serotypes of pneumococcus that are responsible for over 80% of all invasive pneumococcal disease in children.
- ❑ **B.** Individuals of all ages at high risk for pneumococcal disease should receive both the conjugate (PCV7) and polysaccharide (PPV23) vaccines.
- ❑ **C.** The pneumococcal conjugate vaccine PCV7 reduces nasopharyngeal carriage of pneumococcus.
- ❑ **D.** Black and Hispanic persons ≥ 65 years of age report receiving the pneumococcal vaccine much less often than do white persons ≥ 65 years of age in New York City.

3. Which one of the following statements regarding acute otitis media (AOM) and the observation option is FALSE?

- ❑ **A.** The observation option is recommended for children under 2 years of age with a certain AOM diagnosis.
- ❑ **B.** In some instances, parents of a child with AOM can be given an antibiotic prescription with the instruction that they fill it only if their child's symptoms persist or worsen.
- ❑ **C.** Use of additional antibiotics will not hasten the resolution of asymptomatic middle ear effusion.

4. The decrease in new cases of multi-drug-resistant tuberculosis (MDRTB) in New York City has primarily been due to which one of the following?

- ❑ **A.** Decreased immigration from countries with high rates of tuberculosis
- ❑ **B.** The availability of new, more powerful drugs for the treatment of tuberculosis
- ❑ **C.** Implementation of good public health practices including the use of directly observed therapy (DOT)
- ❑ **D.** The decrease in new HIV infections, which fuels the development of MDRTB

5. Which of the following should be considered in a patient with persistent signs or symptoms of infection following appropriate STD treatment?

- ❑ **A.** Inadequate dosing due to less than optimal medication adherence by the patient
- ❑ **B.** Re-infection resulting from exposure to a new infected partner or an ongoing partner who remained untreated
- ❑ **C.** Drug resistance to the chosen pharmacological agent
- ❑ **D.** All of the above

6. How well did this Continuing Education activity achieve its educational objectives?

❑ **A.** Very well ❑ **B.** Adequately ❑ **C.** Poorly

Name _____

Degree_____ **Telephone #**_____

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