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Gonococcal Infections

*Treatment Guidelines From the Centers for Disease Control**

Gonococcal Infections Among Adolescents and Adults

An estimated 1 million new infections with *N. gonorrhoeae* occur in the United States each year. Most infections among men produce symptoms that cause the person to seek curative treatment soon enough to prevent serious sequelae — but not soon enough to prevent transmission to others. Many infections among women do not produce recognizable symptoms until complications such as PID have occurred. PID, whether symptomatic or asymptomatic, can cause tubal scarring leading to infertility or ectopic pregnancy. Because gonococcal infections among women are often asymptomatic, a primary measure for controlling gonorrhea in the United States has been the screening of high-risk women.

Uncomplicated Gonococcal Infections

Recommended Regimens

- ☞ Ceftriaxone 125 mg IM in a single dose
or
- ☞ Cefixime 400 mg orally in a single dose
or
- ☞ Ciprofloxacin 500 mg orally in a single dose
or
- ☞ Ofloxacin 400 mg orally in a single dose
PLUS
- ☞ A regimen effective against possible coinfection with *C. trachomatis*, such as doxycycline 100 mg orally 2 times a day for 7 days.

Many antibiotics are safe and effective for treating gonorrhea, eradicating *N. gonorrhoeae*, ending the possibility of further

transmission, relieving symptoms, and reducing the chances of sequelae.

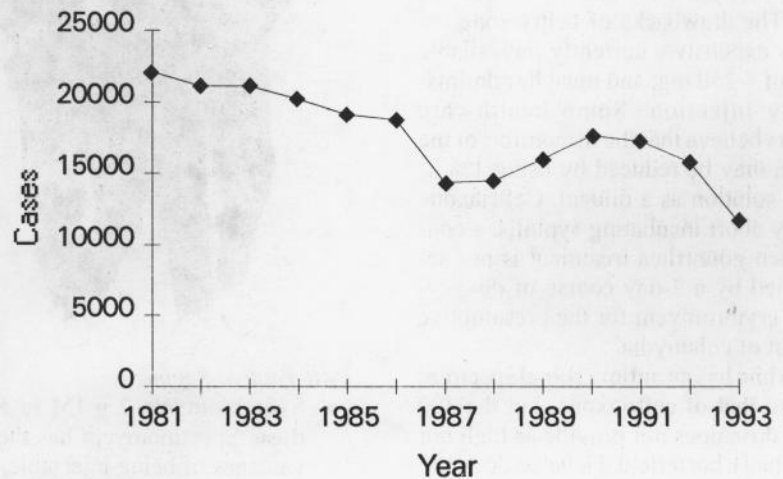
Selection of a treatment regimen for *N. gonorrhoeae* infection requires consideration of the anatomic site of infection, resistance of *N. gonorrhoeae* strains to antimicrobials, the possibility of concurrent infection with *C. trachomatis*, and the side effects and costs of the various treatment regimens.

Because coinfection with *C. trachomatis* is common, persons treated for gonor-

rhea should be treated presumptively with a regimen that is effective against *C. trachomatis*.

Most experts agree that other regimens recommended for the treatment of *C. trachomatis* infection are also likely to be satisfactory for the treatment of coinfection. However, studies have not been conducted to investigate possible interactions between other treatments for *N. gonorrhoeae* and *C. trachomatis*, including inter-

Gonorrhea By Year Reported, Virginia, 1981-1993



Gonorrhea morbidity has decreased in recent years, in parallel with the national trend. The cause(s) of this decline are not completely understood. Possible contributing factors that need further study include changes in sexual behavior, less transmission due to public health intervention, underreporting of cases, and diminished screening efforts.

actions influencing the effectiveness and side effects of cotreatment.

In clinical trials, these recommended regimens cured >95% of anal and genital infections; any of the regimens may be used for uncomplicated anal or genital infection. Published studies indicate that ceftriaxone 125 mg and ciprofloxacin 500 mg can cure ≥90% of pharyngeal infections. If pharyngeal infection is a concern, one of these two regimens should be used.

Ceftriaxone in a single dose of either 125 mg or 250 mg provides sustained, high bactericidal levels in the blood. Extensive clinical experience indicates that both doses are safe and effective for the treatment of uncomplicated gonorrhea at all sites. In the past, the 250 mg dose has been recommended on the supposition that the routine use of a higher dose may forestall the development of resistance. However, on the basis of ceftriaxone's activity against *N. gonorrhoeae*, its pharmacokinetics, and the results in clinical trials of doses as low as 62.5 mg, the 125 mg dose appears to have a therapeutic reserve at least as large as that of other accepted treatment regimens. No ceftriaxone-resistant strains of *N. gonorrhoeae* have been reported. The drawbacks of ceftriaxone are that it is expensive, currently unavailable in vials of <250 mg, and must be administered by injection. Some health-care providers believe that the discomfort of the injection may be reduced by using 1% lidocaine solution as a diluent. Ceftriaxone also may abort incubating syphilis, a concern when gonorrhea treatment is not accompanied by a 7-day course of doxycycline or erythromycin for the presumptive treatment of chlamydia.

Cefixime has an antimicrobial spectrum similar to that of ceftriaxone, but the 400 mg oral dose does not provide as high nor as sustained a bactericidal level as does 125 mg of ceftriaxone. Cefixime appears to be effective against pharyngeal gonococcal infection, but few patients with pharyngeal infection have been included in studies. No gonococcal strains resistant to cefixime have been reported. The advantage of cefixime is that it can be administered orally. It is not known if the 400 mg dose can cure incubating syphilis.

Ciprofloxacin at a dose of 500 mg provides sustained bactericidal levels in the blood. Clinical trials have demonstrated that both 250 mg and 500 mg doses are safe and effective for the treatment of uncomplicated gonorrhea at all sites. Most clinical experience in the United States has been with the 500 mg dose. Ciprofloxacin can be administered orally and is less expensive than ceftriaxone. No resistance has been reported in the United States, but strains

with decreased susceptibility to some quinolones are becoming common in Asia and have been reported in North America. The 500 mg dose is recommended, rather than the 250 mg dose, because of the trend toward decreasing susceptibility to quinolones and because of rare reports of treatment failure. Quinolones are contraindicated for pregnant or nursing women and for persons ≤17 years of age on the basis of information from animal studies. Quinolones are not active against *T. pallidum*. Ofloxacin is active against *N. gonorrhoeae*, has favorable pharmacokinetics, and the 400 mg dose has been effective for the treatment of uncomplicated anal and genital gonorrhea. In published studies a 400 mg dose cured 22 (88%) of 25 pharyngeal infections.



Alternative Regimens

- **Spectinomycin 2 g IM in a single dose.** Spectinomycin has the disadvantages of being injectable, expensive, inactive against *T. pallidum*, and relatively ineffective against pharyngeal gonorrhea. In addition, resistant strains have been reported in the United States. However, spectinomycin remains useful for the treatment of patients who can tolerate neither cephalosporins nor quinolones.
- **Injectable cephalosporin regimens** other than ceftriaxone 125 mg that have demonstrated efficacy against uncomplicated anal or genital gonococcal infections include these injectable cephalosporins: ceftizoxime 500 mg IM in a single dose; cefotaxime 500 mg IM in a single dose; cefotetan 1 g IM in a single dose; and cefoxitin 2 g IM in a single dose. None of these injectable cephalosporins offers any advantage com-

pared with ceftriaxone, and there is less clinical experience with them for the treatment of uncomplicated gonorrhea. Of these four regimens, ceftizoxime 500 mg appears to be the most effective according to cumulative experience in published clinical trials.

- **Oral cephalosporin regimens** other than cefixime 400 mg include cefuroxime axetil 1 g orally in a single dose and cefpodoxime proxetil 200 mg orally in a single dose. These two regimens have anti-gonococcal activity and pharmacokinetics less favorable than the 400 mg cefixime regimen, and there is less clinical experience with them in the treatment of gonorrhea. They have not been very effective against pharyngeal infections among the few patients studied.
- **Quinolone regimens** other than ciprofloxacin 500 mg and ofloxacin 400 mg include enoxacin 400 mg orally in a single dose; lomefloxacin 400 mg orally in a single dose; and norfloxacin 800 mg orally in a single dose. They appear to be safe and effective for the treatment of uncomplicated gonorrhea, but none appears to offer any advantage over ciprofloxacin at a dose of 500 mg or ofloxacin at 400 mg. Enoxacin and norfloxacin are active against *N. gonorrhoeae*, have favorable pharmacokinetics, and have been effective in clinical trials, but there is minimal experience with their use in the United States. Lomefloxacin is effective against *N. gonorrhoeae* and has very favorable pharmacokinetics, but there are few published clinical studies to support its use for the treatment of gonorrhea, and there is little experience with its use in the United States.

Many other antimicrobials are active against *N. gonorrhoeae*. These guidelines are not intended to be a comprehensive list of all effective treatment regimens.

Other Management Considerations

Persons treated for gonorrhea should be screened for syphilis by serology when gonorrhea is first detected. Gonorrhea treatment regimens that include ceftriaxone or a 7-day course of either doxycycline or erythromycin may cure incubating syphilis, but few data relevant to this topic are available.

Follow-Up

Persons who have uncomplicated gonorrhea and who are treated with any of the regimens in these guidelines need not return for a test-of-cure. Those persons with

symptoms persisting after treatment should be evaluated by culture for *N. gonorrhoeae*, and any gonococci isolated should be tested for antimicrobial susceptibility. Infections detected after treatment with one of the recommended regimens more commonly occur because of reinfection rather than treatment failure, indicating a need for improved sex partner referral and patient education. Persistent urethritis, cervicitis, or proctitis also may be caused by *C. trachomatis* and other organisms.

Management of Sex Partners

Patients should be instructed to refer sex partners for evaluation and treatment. Sex partners of symptomatic patients who have *N. gonorrhoeae* infection should be evaluated and treated for *N. gonorrhoeae* and *C. trachomatis* infections, if their last sexual contact with the patient was within 30 days of onset of the patient's symptoms. If the index patient is asymptomatic, sex partners whose last sexual contact with the patient was within 60 days of diagnosis should be evaluated and treated. Health-care providers should treat the most recent sex partner, if last sexual intercourse took place before those time periods. Patients should be instructed to avoid sexual intercourse until patient and partner(s) are cured. In the absence of microbiologic test-of-cure, this means until therapy is completed and patient and partner(s) are without symptoms.

Allergy, Intolerance, or Adverse Reactions

Persons who cannot tolerate cephalosporins should, in general, be treated with quinolones. Those who can take neither cephalosporins nor quinolones should be treated with spectinomycin, except for those patients who are suspected or known to have pharyngeal infection. For pharyngeal infections among persons who can tolerate neither a cephalosporin nor quinolones, some studies suggest that trimethoprim/sulfamethoxazole may be effective at a dose of 720 mg trimethoprim/3,600 mg sulfamethoxazole orally once a day for 5 days.

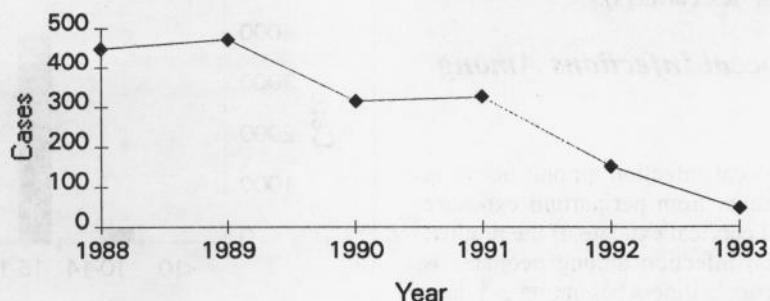
Pregnancy

Pregnant women should not be treated with quinolones or tetracyclines. Those infected with *N. gonorrhoeae* should be treated with a recommended or alternate cephalosporin. Women who cannot tolerate a cephalosporin should be administered a single dose of 2 g of spectinomycin IM. Erythromycin is the recommended treatment for presumptive or diagnosed *C. trachomatis* infection during pregnancy.

HIV Infection

Persons with HIV infection and gonococcal infection should receive the same treatment as persons not infected with HIV.

Reported Pelvic Inflammatory Disease
Due To *N. gonorrhoeae*, By Year, Virginia,
1984-1993



Gonococcal Conjunctivitis

Only one North American study of the treatment of gonococcal conjunctivitis among adults has been published in recent years. In that study, 12 of 12 patients responded favorably to a single 1 g IM injection of ceftriaxone. The recommendations that follow reflect the opinions of expert consultants.

Recommended Treatment Regimen

- ☞ A single, 1 g dose of ceftriaxone should be administered IM, and the infected eye should be lavaged with saline solution once.

Management of Sex Partners

As for uncomplicated infections, patients should be instructed to refer sex partner(s) for evaluation and treatment (see Uncomplicated Gonococcal Infections, Management of Sex Partners).

Disseminated Gonococcal Infection

Disseminated gonococcal infection (DGI) results from gonococcal bacteremia, often resulting in petechial or pustular acral skin lesions, asymmetrical arthralgias, tenosynovitis or septic arthritis — and is occasionally complicated by hepatitis and, rarely, by endocarditis or meningitis. Strains of *N. gonorrhoeae* that cause DGI tend to cause little genital inflammation. These strains have become uncommon in the United States during the past decade.

No North American studies of the treatment of DGI have been published recently. The recommendations that follow reflect the opinions of expert consultants.

Treatment

Hospitalization is recommended for initial therapy, especially for patients who cannot be relied on to comply with treatment, for those for whom the diagnosis is uncertain, and for those who have purulent synovial effusions or other complications. Patients should be examined for clinical

evidence of endocarditis and meningitis. Patients treated for DGI should be treated presumptively for concurrent *C. trachomatis* infection.

Recommended Initial Regimen

- ☞ Ceftriaxone 1 g IM or IV every 24 hours.

Alternative Initial Regimens

- ☞ Cefotaxime 1 g IV every 8 hours

or

- ☞ Ceftizoxime 1 g IV every 8 hours

or

For persons allergic to -lactam drugs:

- ☞ Spectinomycin 2 g IM every 12 hours.
- All regimens should be continued for 24-48 hours after improvement begins; then therapy may be switched to one of the following regimens to complete a full week of antimicrobial therapy:

- ☞ Cefixime 400 mg orally 2 times a day

or

- ☞ Ciprofloxacin 500 mg orally 2 times a day.

NOTE: Ciprofloxacin is contraindicated for children, adolescents ≤ 17 years of age, and pregnant and lactating women.

Management of Sex Partners

Gonococcal infection is often asymptomatic in sex partners of patients with DGI. As for uncomplicated infections, patients should be instructed to refer sex partner(s) for evaluation and treatment (see Uncomplicated Gonococcal Infections, Management of Sex Partners).

Gonococcal Meningitis and Endocarditis

Recommended Initial Regimen

- ☞ 1-2 g of ceftriaxone IV every 12 hours.

Therapy for meningitis should be continued for 10-14 days and for endocarditis for at least 4 weeks. Treatment of complicated DGI should be undertaken in consultation with an expert.

Management of Sex Partners

As for uncomplicated infections, patients should be instructed to refer sex partners for evaluation and treatment (see Uncomplicated Gonococcal Infections, Management of Sex Partners).

Gonococcal Infections Among Infants

Gonococcal infection among neonates usually results from peripartum exposure to infected cervical exudate of the mother. Gonococcal infection among neonates is usually an acute illness beginning 2-5 days after birth. The incidence of *N. gonorrhoeae* among neonates varies in U.S. communities, depends on the prevalence of infection among pregnant women, on whether pregnant women are screened for gonorrhea, and on whether newborns receive ophthalmia prophylaxis. The prevalence of infection is <1% in most prenatal patient populations, but may be higher in some settings.

Of greatest concern are complications of ophthalmia neonatorum and sepsis, including arthritis and meningitis. Less serious manifestations at sites of infection include rhinitis, vaginitis, urethritis, and inflammation at sites of intrauterine fetal monitoring.

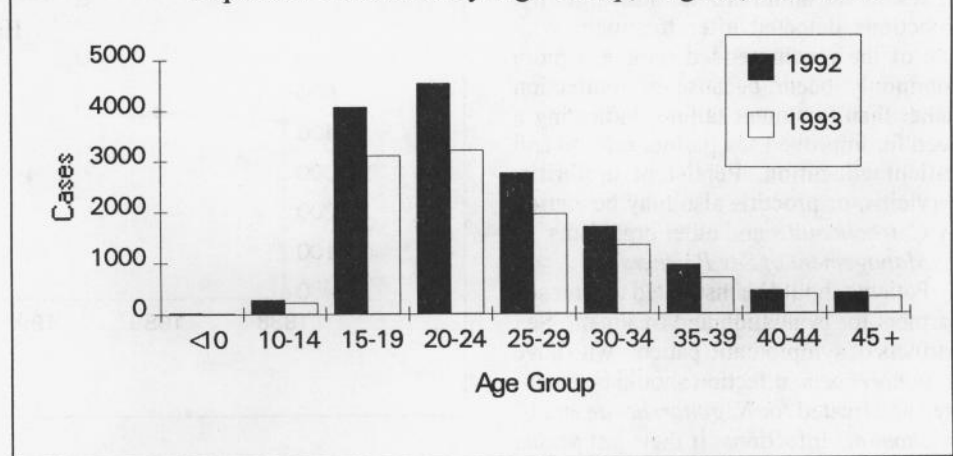
Ophthalmia Neonatorum Caused by *N. gonorrhoeae*

In most patient populations in the United States, *C. trachomatis* and non-sexually transmitted agents are more common causes of neonatal conjunctivitis than *N. gonorrhoeae*. However, *N. gonorrhoeae* is especially important because gonococcal ophthalmia may result in perforation of the globe and in blindness.

Diagnostic Considerations

Infants at high risk for gonococcal ophthalmia in the United States are those who do not receive ophthalmia prophylaxis, whose mothers have had no prenatal care, or whose mothers have a history of STDs or substance abuse. The presence of typical Gram-negative diplococci in a Gram-stained smear of conjunctival exudate suggests a diagnosis of *N. gonorrhoeae* conjunctivitis. Such patients should be treated presumptively for gonorrhea after obtaining appropriate cultures for *N. gonorrhoeae*; appropriate chlamydial testing should be done simultaneously. The decision not to treat presumptively for *N. gonorrhoeae* among patients without evidence of gonococci on a Gram-stained smear of conjunctival exudate, or among patients for whom a Gram-stained smear cannot be performed, must be made on a

Reported Gonorrhea By Age Group, Virginia, 1992-1993



case-by-case basis after considering the previously described risk factors.

A specimen of conjunctival exudate also should be cultured for isolation of *N. gonorrhoeae*, since culture is needed for definitive microbiologic identification and for antibiotic susceptibility testing. Such definitive testing is required because of the public health and social consequences for the infant and mother that may result from the diagnosis of gonococcal ophthalmia. *Moraxella catarrhalis* and other *Neisseria* species are uncommon causes of neonatal conjunctivitis that can mimic *N. gonorrhoeae* on Gram-stained smear. To differentiate *N. gonorrhoeae* from *M. catarrhalis* and other *Neisseria* species, the laboratory should be instructed to perform confirmatory tests on any colonies that meet presumptive criteria for *N. gonorrhoeae*.

Recommended Regimen

☞ Ceftriaxone 25-50 mg/kg IV or IM in a single dose, not to exceed 125 mg.

NOTE: Topical antibiotic therapy alone is inadequate and is unnecessary if systemic treatment is administered.

Other Management Considerations

Simultaneous infection with *C. trachomatis* has been reported and should be considered for patients who do not respond satisfactorily. The mother and infant should be tested for chlamydial infection at the same time that gonorrhea testing is done.

Ceftriaxone should be administered cautiously among infants with elevated bilirubin levels, especially premature infants.

Follow-Up

Infants should be admitted to the hospital and evaluated for signs of disseminated infection (e.g., sepsis, arthritis, and meningitis). One dose of ceftriaxone is adequate for gonococcal conjunctivitis, but many pediatricians prefer to maintain infants on

antibiotics until cultures are negative at 48-72 hours. The decision on duration of therapy should be made with input from experienced physicians.

Management of Mothers and Their Sex Partners

The mothers of infants with gonococcal infection and their sex partners should be evaluated and treated following the recommendations for treatment of gonococcal infections in adults (see Gonococcal Infections Among Adolescents and Adults).

Disseminated Gonococcal Infection Among Infants

Sepsis, arthritis, meningitis, or any combination thereof are rare complications of neonatal gonococcal infection. Gonococcal scalp abscesses also may develop as a result of fetal monitoring. Detection of gonococcal infection among neonates who have sepsis, arthritis, meningitis, or scalp abscesses requires cultures of blood, CSF, and joint aspirate on chocolate agar. Cultures of specimens from the conjunctiva, vagina, oropharynx, and rectum onto gonococcal selective medium are useful to identify sites of primary infection, especially if inflammation is present. Positive Gram-stained smears of exudate, CSF, or joint aspirate provide a presumptive basis for initiating treatment for *N. gonorrhoeae*. Diagnoses based on positive Gram-stained smears or presumptive isolation by cultures should be confirmed with definitive tests on culture isolates.

Recommended Regimen

☞ Ceftriaxone 25-50 mg/kg/day IV or IM in a single daily dose for 7 days, with a duration of 10-14 days, if meningitis is documented;

or

☞ Cefotaxime 25 mg/kg IV or IM every 12 hours for 7 days, with a duration of

Reports through March 3, 1994 of flu-like illness from sentinel physicians in Virginia (33 offices reporting). The predominant isolate to date has been the type A/Beijing/32/92(H3N2)-like strain. Activity on that date was characterized as "sporadic."



10-14 days, if meningitis is documented.

Prophylactic Treatment for Infants Whose Mothers Have Gonococcal Infection

Infants born to mothers who have untreated gonorrhea are at high risk for infection.

Recommended Regimen in the Absence of Signs of Gonococcal Infection

- ☞ Ceftriaxone 25-50 mg/kg IV or IM, not to exceed 125 mg, in a single dose.

If simultaneous infection with *C. trachomatis* has been reported, mother and infant should be tested for chlamydial infection.

Follow-Up

Follow-up examination is not required.

Management of Mothers and Their Sex Partners

The mothers of infants with gonococcal infection and the mother's sex partners should be evaluated and treated following the recommendations for treatment of gonococcal infections among adults (see Gonococcal Infections).

Gonococcal Infections Among Children

After the neonatal period, sexual abuse is the most common cause of gonococcal infection among preadolescent children (see Sexual Assault or Abuse of Children). Vaginitis is the most common manifestation of gonococcal infection among preadolescent children. PID following vaginal infection appears to be less common than among adults. Among sexually-abused children, anorectal and pharyngeal infections with *N. gonorrhoeae* are common and are frequently asymptomatic.

Diagnostic Considerations

Because of the potential medical/legal use of the test results for *N. gonorrhoeae* among children, only standard culture systems for the isolation of *N. gonorrhoeae*

should be used to diagnose *N. gonorrhoeae* for these children. Nonculture gonococcal tests, including Gram-stained smear, DNA probes, or EIA tests should not be used; none of these tests have been approved by the FDA for use in the oropharynx, rectum, or genital tract of children. Specimens from the vagina, urethra, pharynx, or rectum should be streaked onto selective media for isolation of *N. gonorrhoeae*. All presumptive isolates of *N. gonorrhoeae* should be confirmed by at least two tests that involve different principles, e.g., biochemical, enzyme substrate, or serologic. Isolates should be preserved to permit additional or repeated analysis.

Recommended Regimen for Children Who Weigh ≥ 45 kg

Children who weigh ≥ 45 kg should be administered the same treatment regimens as those recommended for adults (see Gonococcal Infections).

Children Who Weigh < 45 kg

The following treatment recommendations are for children with uncomplicated gonococcal vulvovaginitis, cervicitis, urethritis, pharyngitis, or proctitis.

- ☞ Ceftriaxone 125 mg IM in a single dose.
- Alternative Regimen

- ☞ Spectinomycin 40 mg/kg (maximum 2 g) IM in a single dose.

Children Who Weigh < 45 kg and Who Have Bacteremia, Arthritis, or Meningitis

Recommended Regimen

- ☞ Ceftriaxone 50 mg/kg (maximum 1 g) IM or IV in a single dose daily for 7 days.

NOTE: For meningitis, increase the duration of treatment to 10-14 days and the maximum dose to 2 g.

Follow-Up

Follow-up cultures of specimens from infected sites are necessary to ensure that treatment has been effective.

Other Management Considerations

Only parenteral cephalosporins are recommended for use among children.

Ceftriaxone is approved for all gonococcal indications among children; cefotaxime is approved for gonococcal ophthalmia only. Oral cephalosporins (cefixime, cefuroxime axetil, cefpodoxime) have not received adequate evaluation in the treatment of gonococcal infections among pediatric patients to recommend their use. The pharmacokinetic activity of these drugs among adults cannot be extrapolated to children.

All children with gonococcal infections should be evaluated for coinfection with syphilis and *C. trachomatis*.

Ophthalmia Neonatorum Prophylaxis

Instillation of a prophylactic agent into the eyes of all newborn infants is recommended to prevent gonococcal ophthalmia neonatorum and is required by law in most states. Although all the regimens that follow effectively prevent gonococcal eye disease, their efficacy in preventing chlamydial eye disease is not clear. Furthermore, they do not eliminate nasopharyngeal colonization with *C. trachomatis*. Treatment of gonococcal and chlamydial infections among pregnant women is the best method for preventing neonatal gonococcal and chlamydial disease. However, ocular prophylaxis should continue because it can prevent gonococcal ophthalmia and, in some populations, >10% of pregnant women may receive no prenatal care.

Prophylaxis

Recommended Preparations

- ☞ Silver nitrate (1%) aqueous solution in a single application

or

- ☞ Erythromycin (0.5%) ophthalmic ointment in a single application

or

- ☞ Tetracycline ophthalmic ointment (1%) in a single application.

One of the above preparations should be instilled into the eyes of every neonate as soon as possible after delivery. If prophylaxis is delayed (i.e., not administered in the delivery room), hospitals should establish a monitoring system to see that all infants receive prophylaxis. All infants should be administered ocular prophylaxis, whether delivery is vaginal or caesarian. Single-use tubes or ampules are preferable to multiple-use tubes. Bacitracin is *not* effective.

*Adapted from: Centers for Disease Control. 1993 Sexually transmitted diseases treatment guidelines. MMWR 1993;42 (No. RR-14):56-67.

Cases of Selected Notifiable Diseases, Virginia, February 1 through February 28, 1994.*

Disease	Total Cases Reported This Month						Total Cases Reported to Date in Virginia		
	State	Regions					This Yr	Last Yr	5 Yr Avg
		NW	N	SW	C	E			
AIDS	114	6	50	4	34	20	215	174	113
Campylobacteriosis	32	7	3	5	6	11	47	42	59
Gonorrhea†	926	-	-	-	-	-	2245	1017	2445
Hepatitis A	17	1	6	3	0	7	18	28	23
Hepatitis B	10	2	1	0	1	6	15	21	37
Hepatitis NANB	4	1	0	1	2	0	6	3	5
Influenza	70	13	1	45	5	6	334	383	631
Kawasaki Syndrome	1	0	0	1	0	0	1	3	3
Legionellosis	0	0	0	0	0	0	2	0	1
Lyme Disease	8	1	2	1	1	3	8	3	4
Measles	1	0	1	0	0	0	1	1	2
Meningitis, Aseptic	10	1	5	2	0	2	14	34	34
Meningitis, Bacterial‡	7	2	0	2	0	3	8	5	25
Meningococcal Infections	7	1	1	2	2	1	11	5	9
Mumps	4	1	0	1	0	2	4	9	12
Pertussis	6	1	1	0	1	3	9	1	2
Rabies in Animals	32	7	5	8	6	6	51	55	35
Reye Syndrome	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0
Salmonellosis	69	16	9	10	24	10	109	129	134
Shigellosis	54	0	8	2	29	15	84	41	43
Syphilis (1° & 2°)†	53	2	0	0	2	49	100	87	110
Tuberculosis	52	4	10	6	18	14	52	0	38

Localities Reporting Animal Rabies: Accomack 1 raccoon; Augusta 1 skunk; Bedford 1 raccoon; Campbell 2 raccoons, 1 skunk; Charlotte 1 skunk; Chesterfield 1 raccoon; Clarke 1 raccoon; Fairfax 3 raccoons; Goochland 1 skunk; Henrico 1 raccoon; Isle of Wight 1 raccoon; Loudoun 1 raccoon; Louisa 1 raccoon; Mathews 1 raccoon; Mecklenburg 1 raccoon, 1 skunk; Patrick 4 raccoons; Prince William 1 skunk; Rappahannock 1 fox; Rockingham 1 skunk; Stafford 1 raccoon; Virginia Beach 3 raccoons; Warren 1 raccoon.

Occupational Illnesses: Asbestosis 8; Carpal Tunnel Syndrome 37; Coal Workers' Pneumoconiosis 9; Lead Poisoning 8; Loss of Hearing 10; Mesothelioma 1.

*Data for 1994 are provisional. †Total now includes military cases to make the data consistent with reports of the other diseases. ‡Other than meningococcal.

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