3. TREATMENT OF SPECIFIC INFECTIONS

3.1. GONOCOCCAL INFECTIONS

A large proportion of gonococcal isolates worldwide are now resistant to penicillins, tetracyclines, and other older antimicrobial agents, which can therefore no longer be recommended for the treatment of gonorrhoea.

It is important to monitor local in vitro susceptibility, as well as the clinical efficacy of recommended regimens.

Note

In general it is recommended that concurrent anti-chlamydia therapy be given to all patients with gonorrhoea, as described in the section on chlamydia infections, since dual infection is common. This does not apply to patients in whom a specific diagnosis of C. trachomatis has been excluded by a laboratory test.

UNCOMPLICATED ANOGENITAL INFECTION

Recommended regimens

- ciprofloxacin, 500 mg orally, as a single dose
  OR
- azithromycin, 2 g orally, as a single dose
  OR
- ceftriaxone, 125 mg by intramuscular injection, as a single dose
  OR
- cefixime, 400 mg orally, as a single dose
  OR
- spectinomycin, 2 g by intramuscular injection, as a single dose.

Note

- Ciprofloxacin is contraindicated in pregnancy. The manufacturer does not recommend it for use in children and adolescents.
There is accumulating evidence that the cure rate of Azithromycin for gonococcal infections is best achieved by a 2-gram single dose regime. The 1-gram dose provides protracted sub-therapeutic levels which may precipitate the emergence of resistance.

There are variations in the anti-gonococcal activity of individual quinolones, and it is important to use only the most active.

**Alternative regimens which may be useful in some countries, depending on the prevalence of resistant gonococci:**

- kanamycin, 2 g by intramuscular injection as a single dose
  - **OR**
  - trimethoprim (80 mg)/sulfamethoxazole (400 mg), 10 tablets orally, as a single dose daily for 3 days.

**Note**

- Kanamycin and trimethoprim/sulfamethoxazole should only be used in areas where in vitro resistance rates are low and are monitored at regular intervals. In addition, second-line treatment with recommended drugs should be available.

**DISSEMINATED INFECTION**

**Recommended regimens**

- ceftriaxone, 1g by intramuscular or intravenous injection, once daily for 7 days (alternative third-generation cephalosporins may be required where ceftriaxone is not available, but more frequent administrations will be needed)
  - **OR**
  - spectinomycin, 2g by intramuscular injection, twice daily for 7 days. There are some data to suggest that therapy for 3 days is adequate.

For gonococcal meningitis and endocarditis the same dosages apply but the duration of therapy will need to be increased to 4 weeks for endocarditis.

**GONOCOCCAL OPHTHALMIA**

This is a serious condition that requires systemic therapy as well as local irrigation with saline or other appropriate solutions. Irrigation is particularly important when the recommended therapeutic regimens are not available. Careful hand washing by personnel caring for infected patients is essential.
A. ADULT GONOCOCCAL CONJUNCTIVITIS

**Recommended regimen**
- ceftriaxone, 125 mg by intramuscular injection as a single dose
  - OR
- spectinomycin, 2 g by intramuscular injection as a single dose
  - OR
- ciprofloxacin, 500 mg orally, as a single dose.

This regimen is likely to be effective although there are no published data on its use in gonococcal ophthalmia.

**Alternative regimen where the recommended agents are not available:**
- kanamycin, 2 g by intramuscular injection as a single dose.

**Follow-up**
Careful monitoring of clinical progress is important.

B. NEONATAL GONOCOCCAL CONJUNCTIVITIS

**Recommended regimen**
- ceftriaxone, 50 mg/kg by intramuscular injection as a single dose, to a maximum of 125 mg.

**Alternative regimen where ceftriaxone is not available**
- kanamycin, 25 mg/kg by intramuscular injection as a single dose to a maximum of 75 mg
  - OR
- spectinomycin, 25 mg/kg by intramuscular injection as a single dose to a maximum of 75 mg.

Single-dose ceftriaxone and kanamycin are of proven efficacy. The addition of tetracycline eye ointment to these regimens is of no documented benefit.

**Follow-up**
Patients should be reviewed after 48 hours.

**Prevention of ophthalmia neonatorum**
Using timely eye prophylaxis should prevent gonococcal ophthalmia neonatorum. The infant’s eyes should be carefully cleaned immediately after birth and the application of 1% silver nitrate solution or 1% tetracycline ointment to the eyes of all infants at the time...
of delivery is strongly recommended as a prophylactic measure. However, ocular prophylaxis provides poor protection against *C. trachomatis* conjunctivitis.

Infants born to mothers with gonococcal infection should receive additional treatment as follows:

**Recommended regimen**
- ceftriaxone 50 mg/kg by intramuscular injection as a single dose, to a maximum of 125 mg.

**Alternative regimen where ceftriaxone is not available**
- kanamycin, 25 mg/kg by intramuscular injection as a single dose, to a maximum of 75 mg
- spectinomycin, 25 mg/kg by intramuscular injection as a single dose, to a maximum of 75 mg.

### 3.2. CHLAMYDIA TRACHOMATIS INFECTIONS (OTHER THAN LYMPHOGRANULOMA VENEREUM)

**Uncomplicated urethral, endocervical, or rectal infections**

**Recommended regimens**
- doxycycline, 100 mg orally, twice daily for 7 days
- azithromycin, 1 g orally, in a single dose

**Alternative regimens**
- amoxycillin, 500 mg orally, three times a day for 7 days
- erythromycin, 500 mg orally, four times a day for 7 days
- ofloxacin, 300 mg orally, twice a day for 7 days
- tetracycline, 500 mg orally, four times a day for 7 days.

**Note**
- Tetracyclines are contraindicated during pregnancy and lactation.
- Current evidence indicates that 1 gram single dose therapy of azithromycin is efficacious for chlamydia infection.
There is evidence that extending the duration of treatment beyond 7 days does not improve the cure rate in uncomplicated chlamydia infection. Erythromycin should not be taken on an empty stomach.

**Follow-up**
Compliance with the 7-day regimens is critical. Resistance of *C. trachomatis* to recommended treatment regimens has not been observed.

**CHLAMYDIAL INFECTION IN PREGNANCY**

**Recommended regimens**
- erythromycin, 500 mg orally four times a day for 7 days
  
  **OR**

- amoxycillin, 500 mg orally three times a day for 7 days.

**Note**
- Doxycycline (and other tetracyclines) and ofloxacin are contraindicated in pregnant women. The safety and efficacy of azithromycin use in pregnant and lactating women have not been established.
- Erythromycin estolate is contraindicated during pregnancy because of drug-related hepato-toxicity, so only erythromycin base or erythromycin ethylsuccinate should be used.

**NEONATAL CHLAMYDIAL CONJUNCTIVITIS**

All cases of conjunctivitis in the newborn should be treated for both *N. gonorrhoeae* and *C. trachomatis*, because of the possibility of mixed infection.

**Recommended regimen**
- erythromycin syrup, 50 mg/kg per day orally, in 4 divided doses for 14 days

**Alternative regimen**
- trimethoprim 40mg with sulfamethoxazole 200mg orally, twice daily for 14 days.

There is no evidence that additional therapy with a topical agent provides further benefit. If inclusion conjunctivitis recurs after therapy has been completed, erythromycin treatment should be reinstituted for 2 weeks.
INFANTILE PNEUMONIA

The recommended therapy is erythromycin syrup, 50 mg/kg per day for 14 days. If this is not available, trimethoprim 40mg with sulfamethoxazole 200mg may be given orally twice daily for 3 weeks. However, the optimal duration of therapy has not been established.

3.3. LYMPHOGRANULOMA VENEREUM

Results of controlled trials on the treatment of lymphogranuloma venereum have not been published, and recommendations are based on expert opinion.

**Recommended regimen**

- doxycycline, 100 mg orally, twice daily for 14 days  
  **OR**  
- erythromycin, 500 mg orally, 4 times daily for 14 days.

**Alternative regimens**

- tetracycline, 500 mg orally, 4 times daily for 14 days

**Note**

- Tetracyclines are contraindicated in pregnancy.
- Fluctuant lymph nodes should be aspirated through healthy skin. Incision and drainage or excision of nodes may delay healing. Some patients with advanced disease may require treatment for longer than 14 days, and sequelae such as strictures and/or fistulae may require surgery.
3.4. SYPHILIS

EARLY SYPHILIS

(i.e. primary, secondary, or latent syphilis of not more than two years’ duration)

Recommended regimen

- benzathine benzylpenicillin\(^3\), 2.4 million IU, by intramuscular injection, at a single session. (Because of the volume involved, this dose is usually given as two injections at separate sites.)

Alternative regimen

- procaine benzylpenicillin, 1.2 million IU daily, by intramuscular injection, for 10 consecutive days.

Alternative regimen for penicillin-allergic non-pregnant patients

- doxycycline, 100 mg orally, twice daily for 15 days.
  OR
  - tetracycline, 500 mg orally, 4 times daily for 15 days

LATE LATENT SYPHILIS

Recommended regimen

- benzathine benzylpenicillin, 2.4 million IU by intramuscular injection, once weekly for 3 consecutive weeks.

Alternative regimen

- procaine benzylpenicillin, 1.2 million IU, by intramuscular injection, once daily for 20 consecutive days.

Alternative regimen for penicillin-allergic non-pregnant patients

- doxycycline, 100 mg orally, twice daily for 30 days.
  OR
  - tetracycline, 500 mg orally, 4 times daily for 30 days

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\(^3\) Benzathine benzylpenicillin synonyms: benzathine penicillin G; benzylpenicillin benzathine; benzathine penicillin

Procaine benzylpenicillin synonyms: procaine penicillin G

Aqueous benzylpenicillin synonyms: benzylpenicillin pottasium; benzylpenicillin sodium; crystalline penicillin, penicillin G potassium; penicillin G sodium
Penicillin is the preferred therapy and should be given whenever possible. It should be emphasized that antibiotic treatment is less well defined for late syphilis than it is for early syphilis. In general, late syphilis requires longer therapy.

Consultation with a cardiologist is recommended when caring for patients with cardiovascular syphilis.

**NEUROSYPHILIS**

**Recommended regimen**

- Aqueous benzylpenicillin, 12-24 million IU by intravenous injection, administered daily in doses of 2-4 million IU every 4 hours for 14 days.

**Alternative regimen**

- procaine benzylpenicillin, 1.2 million IU by intramuscular injection, once daily, and probenecid, 500 mg orally, 4 times daily, both for 10-14 days.

This regimen should be used only for patients whose outpatient compliance can be assured.

**Note**

Some authorities recommend adding benzathine benzylpenicillin, 2.4 million IU, by intramuscular injection, in 3 consecutive doses once weekly, after completing these regimens, but there are no data to support this approach. Benzathine benzylpenicillin, 2.4 million IU by intramuscular injection does not give therapeutic levels in the cerebrospinal fluid.

**Alternative regimens for penicillin-allergic non-pregnant patients**

- doxycycline, 200 mg orally, twice daily for 30 days.
  OR
- tetracycline, 500 mg orally, 4 times daily for 30 days

**Note**

The above alternatives to penicillin for the treatment of neurosyphilis have not been evaluated in systematic studies. Although their efficacy is not yet well defined, third-generation cephalosporins may be useful in the treatment of neurosyphilis.

The central nervous system may be involved during any stage of syphilis. Clinical evidence of neurological involvement (e.g. optic or auditory symptoms, cranial nerve
palsies) warrants examination of the cerebrospinal fluid. However, this is also highly desirable in all patients with syphilis of more than two years’ duration, or of uncertain duration, in order to evaluate the possible presence of asymptomatic neurosyphilis. Some experts recommend consulting a neurologist when caring for a patient with neurosyphilis, and careful follow-up is essential.

**SYPHILIS AND HIV INFECTION**

All patients with syphilis should be encouraged to undergo testing for HIV because of the high frequency of dual infection and its implications for clinical assessment and management. Neurosyphilis should be considered in the differential diagnosis of neurological disease in HIV-infected individuals. In cases of congenital syphilis, the mother should be encouraged to undergo testing for HIV; if her test is positive, the infant should be referred for follow-up.

Recommended therapy for early syphilis in HIV-infected patients is no different from that in non-HIV-infected patients. However, some authorities advise examination of the cerebrospinal fluid and/or more intensive treatment with a regimen appropriate for all patients with the dual infections of *Treponema pallidum* and HIV, regardless of the clinical stage of syphilis. In all cases, careful follow-up is necessary to ensure adequacy of treatment.

**SYPHILIS IN PREGNANCY**

Pregnant women should be regarded as a separate group requiring close surveillance, in particular to detect possible reinfection after treatment has been given. It is also important to treat the sexual partner(s).

**Recommended regimens**

Pregnant patients at all stages of pregnancy, who are not allergic to penicillin, should be treated with penicillin according to the dosage schedules recommended for the treatment of non-pregnant patients at a similar stage of the disease.

**Alternative regimens for penicillin-allergic pregnant patients**

**a. Early syphilis**

- erythromycin, 500 mg orally, 4 times daily for 15 days

**b. Late syphilis**

- erythromycin, 500 mg orally, 4 times daily for 30 days.
Note
The effectiveness of erythromycin in all stages of syphilis and its ability to prevent the stigmata of congenital syphilis are highly questionable, and many failures have been reported. Its efficacy in neurosyphilis is probably low. Although data are lacking, consideration should probably be given to using an extended course of a third-generation cephalosporin in pregnant women whose allergy is not manifested by anaphylaxis.

Penicillin desensitisation of pregnant women with syphilis requires that the procedure be performed in a hospital setting. This is not feasible at most primary health care settings and can not be recommended as a routine procedure.

Follow-up
Following treatment, quantitated non-treponemal serological tests should be performed at monthly intervals until delivery, and re-treatment should be undertaken if there is serological evidence of reinfection or relapse.

CONGENITAL SYphilis
All infants born to sero-positive mothers should be treated with a single intramuscular dose of benzathine benzylpenicillin, 50 000 IU/kg whether or not the mothers were treated during pregnancy (with or without penicillin). Hospitalisation is recommended for all symptomatic babies born to mothers who were sero-positive. Symptomatic infants and asymptomatic infants with abnormal CSF (up to 2 years of age) should be treated as early congenital syphilis.

Recommended regimens
a. Early congenital syphilis (up to 2 years of age)

   AND

   Infants with abnormal cerebrospinal fluid:

   - aqueous benzylpenicillin 100 000 – 150 000 IU/kg/day administered as 50 000 IU/kg/dose IV every 12 hours, during the first 7 days of life and every 8 hours thereafter for a total of 10 days.

   OR

   - procaine benzylpenicillin, 50 000 IU/kg by intramuscular injection, as a single daily dose for 10 days.
Note
Some experts treat all infants with congenital syphilis as if the cerebrospinal fluid findings were abnormal. Antibiotics other than penicillin (i.e. erythromycin) are not indicated for congenital syphilis except in cases of severe allergy to penicillin. Tetracyclines should not be used in young children.

b. Congenital syphilis of 2 or more years’ duration:
- aqueous benzylpenicillin, 200 000 – 300 000 IU/kg/day by intravenous or intramuscular injection, administered as 50 000 IU/kg every 4-6 hours for 10-14 days.

Alternative regimen for penicillin-allergic patients, after the first month of life:
- erythromycin, 7.5-12.5 mg/kg orally, 4 times daily for 30 days.

Congenital syphilis may occur if the expectant mother has syphilis, but the risk is minimal if she has been given penicillin during pregnancy. All infants of seropositive mothers should be examined at birth and at monthly intervals for 3 months until it is confirmed that serological tests are, and remain, negative. Any antibody carried over from mother to baby usually disappears within 3 months of birth. Where available, IgM-specific serology may aid diagnosis.

Early congenital syphilis generally responds well, both clinically and serologically, to adequate doses of penicillin. Recovery may be slow in seriously ill children with extensive skin, mucous membrane, bone or visceral involvement. Those in poor nutritional condition may succumb to concurrent infections, e.g. pneumonia.

Follow-up of Patients Treated for Syphilis
The follow-up of patients treated for early syphilis should be based on available medical services and resources. The clinical condition of the patients should be assessed and attempts made to detect reinfection during the first year after therapy. Patients with early syphilis who have been treated with appropriate doses and preparations of benzathine benzylpenicillin, should be evaluated clinically and serologically, using a non-treponemal test, after 3 months to assess the results of therapy. A second evaluation should be performed after 6 months and, if indicated by the results at 6 months, again after 12 months, to reassess the condition of the patient and detect possible reinfection.

All patients with cardiovascular syphilis and neurosyphilis should be followed for many years. The follow-up should include clinical, serological, cerebrospinal fluid and, where
necessary, radiological examinations based on the clinician’s assessment of the individual patient’s condition and evaluation of the illness.

At all stages of the disease, repeat treatment should be considered when:

- clinical signs or symptoms of active syphilis persist or recur;
- there is confirmed increase in the titre of a non-treponemal test;

Examination of the cerebrospinal fluid should be undertaken before repeat treatment, unless reinfection and a diagnosis of early syphilis can be established.

Patients should be retreated with the schedules recommended for syphilis of more than two years’ duration. In general, only one re-treatment course is indicated because adequately treated patients may maintain stable, low titres of non-treponemal tests.

### 3.5. CHANCROID

Owing to widespread resistance in all geographical areas, tetracycline and penicillins have no place in the treatment of chancroid. Single-dose therapy with anti-microbials are the preferred regimen.

**Recommended regimen**

- ciprofloxacin, 500 mg orally, twice daily for 3 days
  - OR
  - erythromycin base, 500 mg orally, 4 times daily for 7 days
  - OR
  - azithromycin, 1 g orally, as a single dose.

**Alternative regimens**

- ceftriaxone, 250 mg by intramuscular injection, as a single dose

**Management of lesions**

No special treatment is required. Ulcerative lesions should be kept clean, and fluctuant lymph nodes should be aspirated as required through the surrounding healthy skin. Incision and drainage or excision of nodes may delay healing and is not recommended.
Follow-up
All patients should be followed up until there is clear evidence of improvement or cure. In patients infected with HIV, treatment may appear less effective, but this may be due to co-infection with genital herpes or syphilis. Since chancroid and HIV infection are closely associated and therapeutic failure is likely to be seen with increasing frequency, patients should be followed up weekly until there is clear evidence of improvement.

3.6. GRANULOMA INGUINALE (DONOVANOSIS)
Donovanosis is caused by the intracellular Gram-negative bacterium Calycomatobacterium granulomatis. The disease presents clinically as painless, progressive, ulcerative lesions without regional lymphadenopathy. The lesions are highly vascular and can easily bleed on contact. Treatment should be continued until all lesions have completely epithelialized.

Recommended regimen
- azithromycin, 1 g orally on first day, then 500 mg orally once a day
  OR
- doxycycline, 100 mg orally, twice daily

Alternative regimen
- erythromycin, 500 mg orally, 4 times daily
  OR
- tetracycline, 500 mg orally, 4 times daily
  OR
- trimethoprim (80 mg)/sulfamethoxazole (400 mg), 2 tablets orally, twice daily for a minimum of 14 days,

Note
The addition of a parenteral aminoglycoside such as gentamicin should be strongly considered for HIV-infected patients.

Follow-up
Patients should be followed clinically until signs and symptoms have resolved.
3.7. GENITAL HERPES INFECTIONS

There is no known cure for genital herpes, but the course of symptoms can be modified if systemic therapy with acyclovir, or its analogues, is started as soon as possible following the onset of symptoms. Topical therapy with acyclovir produces only minimal shortening of the duration of symptomatic episodes and is not recommended.

**FIRST CLINICAL EPISODE**

**Recommended regimen**

- acyclovir, 200 mg orally, 5 times daily for 7 days.
  - OR
- acyclovir, 400 mg orally, 3 times daily for 7 days
  - OR
- famciclovir, 250 mg, 3 times daily for 7 days
  - OR
- valaciclovir, 1 g, 2 times daily for 7 days

Treatment can be expected to reduce the formation of new lesions, the duration of pain, the time required for healing, and viral shedding. However, it does not appear to influence the natural history of recurrent disease.

**RECURRENT INFECTIONS**

Most patients with a first-episode of genital HSV-2 infection will have recurrent episodes of genital lesions. Episodic or suppressive antiviral therapy will shorten the duration of genital lesions. Because many patients benefit from antiviral therapy, options for treatment should be discussed with all patients.

When treatment is started during the prodrome or within 1 day after onset of lesions, many patients who have recurrent disease benefit from episodic therapy. If episodic treatment of recurrences is chosen, the patient should be provided with antiviral therapy, or a prescription for the medication, so that treatment can be initiated at first sign of prodrome or genital lesions.
**Recommended regimen**

- acyclovir, 200mg orally, 5 times daily for 5 days
  - OR
- acyclovir 400mg 3 times daily for 5 days
  - OR
- acyclovir 800mg orally twice daily for 5 days
  - OR
- famciclovir 125mg orally twice daily for 5 days
  - OR
- valaciclovir 500mg orally twice daily for 5 days
  - OR
- valaciclovir 1000mg orally once daily for 5 days

**SUPPRESSIVE THERAPY**

Daily suppressive therapy reduces the frequency of genital herpes recurrences by >75% among patients who have frequent recurrences (i.e. six or more recurrences per year). Safety and efficacy have been documented among patients receiving daily therapy with acyclovir for as long as 6 years, and with valaciclovir and famciclovir for 1 year. Suppressive therapy has not been associated with emergence of clinically significant acyclovir resistance among immunocompetent patients.

Suppressive treatment with acyclovir reduces, but does not eliminate, asymptomatic viral shedding. Therefore, the extent to which suppressive therapy may prevent HSV transmission is unknown.

**Recommended regimen**

- acyclovir, 400 mg orally, 2 times daily, continuously.
  - OR
- famciclovir 250mg orally twice daily
  - OR
- valaciclovir 500mg orally once daily
  - OR
- valaciclovir 1000mg orally once daily

Some experts recommend discontinuing acyclovir after one year of continuous use so that the recurrence rate can be reassessed. The lowest continuous dose that will suppress recurrences in an individual can be determined only empirically.
Severe Disease
- acyclovir, 5-10 mg/kg IV every 8 hours, 5-7 days or until clinical resolution is attained.

**HERPES IN PREGNANCY**

During the first clinical episode of genital herpes, treat with oral acyclovir.

Vaginal delivery in women who develop primary genital herpes shortly before delivery puts babies at risk for neonatal herpes. Babies born to women with recurrent disease are at very low risk. Genital cultures late in pregnancy are poor predictors of shedding during delivery. Careful history and physical examination serve as a guide to the need for caesarean section in mothers with genital herpes lesions.

**Treatment for Neonates**
- acyclovir, 10 mg/kg intravenously three times a day, for 10-21 days

**HERPES AND HIV CO-INFECTION**

In people whose immunity is deficient, persistent and/or severe mucocutaneous ulcerations may occur, often involving large areas of perianal, scrotal or penile skin. The lesions may be painful and atypical, making a clinical diagnosis difficult. The natural history of herpes sores may become altered. Most lesions of herpes in HIV infected persons will respond to acyclovir, but the dose may have to be increased and treatment given for longer than the standard recommended period. Subsequently, patients may benefit from chronic suppressive therapy. In some cases the patients may develop thymidine-kinase deficient mutants for which standard antiviral therapy becomes ineffective.

The recommended regimen in severe herpes simplex lesions with co-infection with HIV is acyclovir 400mg orally 3-5 times daily until clinical resolution is attained.

**3.8. VENEREAL WARTS**

Human papilloma virus (HPV) is a common sexually transmitted pathogen. Genital warts are painless and do not lead to serious complications, except where they may cause obstruction. The removal of the lesion does not mean cure of the infection. No treatment is completely satisfactory. In most clinical situations, podophyllin (or podophyllotoxin) or trichloroacetic acid (TCA) is used to treat external genital and perianal warts. Cryotherapy, with liquid nitrogen, solid carbon dioxide, or cryoprobe is preferred by many physicians when available. Cryotherapy is non-toxic, does not require anaesthesia and, if used properly, does not result in scarring.
Sexual partners should be examined for evidence of warts. Patients with anogenital warts should be made aware that they are contagious to sexual partners. The use of condoms is recommended to help reduce transmission.

Specific types of HPV may give rise to invasive carcinoma of the cervix. It is recommended practice to examine the cervix in all female STI patients, and to perform regular cervical smears in this population for Papanicolaou examination. However, a high percentage of smears in adolescents may appear to be abnormal.

The available treatments for visible anogenital warts are either patient-applied (i.e. podofilox and imiquimod), removing the need for frequent clinic visits, or provider-administered. Podofilox 0.5% solution may be applied with a cotton swab and the gel can be applied with a finger.

**Recommended regimens**

**a. Chemical**

**Patient-applied**

- Podofilox 0.5% solution or gel twice daily for 3 days, followed by 4 days of no treatment, and the cycle repeated up to 4 times.  
  (Total volume of podofilox should not exceed 0.5ml per day)

- Imiquimod 5% cream applied with a finger at bedtime, left on overnight, 3 times a week for as long as 16 weeks.  
  (The treatment area should be washed with soap and water 6-10 hours after application)

**Note**

The safety of both podofilox and imiquimod during pregnancy has not been established.

**Provider administered**

- Podophyllin 10-25% in compound tincture of benzoin, applied carefully to the warts, avoiding normal tissue. External genital and perianal warts should be washed thoroughly 1-4 hours after the application of podophyllin. Podophyllin applied to warts on vaginal or anal epithelial surfaces should be allowed to dry before removing the speculum or anoscope. Treatment should be repeated at weekly intervals.

- Where available, podophyllotoxin 0.5%, one of the active constituents of podophyllin resin, is recommended. Its efficacy is equal to that of podophyllin, but it is less toxic and appears to cause less erosion.
Some experts advise against the use of podophyllin for anal warts. Large amounts of podophyllin should not be used because it is toxic and easily absorbed; its use during pregnancy and lactation is contraindicated.

**OR**

Trichloroacetic acid (TCA) (80-90%) applied carefully to the warts avoiding normal tissue, followed by powdering of the treated area with talc or sodium bicarbonate (baking soda) to remove unreacted acid. Repeat application at weekly intervals.

**b. Physical**

Cryotherapy with liquid nitrogen, solid carbon dioxide, or a cryoprobe. Repeat applications every 1-2 weeks

**OR**

Electrosurgery

**OR**

Surgical removal.

**Vaginal warts**

Cryotherapy (with liquid nitrogen)

Podophyllin – 10-25% (allow to dry before removing speculum)

TCA or BCA (80-90%)

**Cervical warts**

Management should include consultation with an expert

Pap smear

No TCA or podophyllin

Treatment of cervical warts should not be started until the results from a cervical smear test are known.

Most experts advise against the use of podophyllin or trichloroacetic acid for cervical warts. One of the alternative therapies listed above should therefore be used.

**Meatal and urethral warts**

Cryotherapy

Podophyllin 10-25%
Accessible meatal warts may be treated with podophyllin, 10-25%, in compound tincture of benzoin, or podophyllotoxin 0.5% where available. Great care should be taken to ensure that the treated area is dried before contact with normal, opposing epithelial surfaces is allowed. Low success rates with podophyllin are reported.

Urethroscopy is necessary to diagnose intra-urethral warts, but they should be suspected in men with recurrent meatal warts. Some experts prefer electrosurgical removal. Intra-urethral instillation of a 5% cream of fluorouracil or thiotepa may be effective, but neither has been adequately evaluated. Podophyllin should not be used.

### 3.9. TRICHOMONAS VAGINALIS INFECTIONS

#### TRICHOMONAS VAGINALIS VAGINAL INFECTION

**Recommended regimen**

- metronidazole, 2 g orally, in a single dose
  
  **OR**
  
- tinidazole, 2 g orally, in a single dose.

The reported cure rate in women ranges from 82% to 88% but may be increased to 95% if sexual partners are treated simultaneously.

**Alternative regimen**

- metronidazole, 400 or 500 mg orally, twice daily for 7 days
  
  **OR**
  
- tinidazole, 500 mg orally, twice daily for 5 days.

Other 5-nitroimidazoles are also effective, both in single and in multiple dose regimens.

**Note**

Patients taking metronidazole or other imidazoles should be cautioned not to consume alcohol while they are taking the drug and up to 24 hours after taking the last dose.

Asymptomatic women with trichomoniasis should be treated with the same regimen as symptomatic women.

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4 Metronidazole is available in either 200 mg or 250 mg capsules.
Management of sexual partners
All sexual partners should be notified and treated, and patients should be advised against sexual intercourse until both the index patient and the partner(s) are treated. Trichomoniasis is frequently asymptomatic in men but is increasingly recognized as a cause of symptomatic non-gonococcal, non-chlamydial urethritis. For treatment of trichomonas vaginalis urethritis, see below.

Follow-up
Patients should be asked to return after 7 days if symptoms persist. Reinfection should be carefully excluded. Patients not cured following initial treatment often respond favourably to repeat treatment with the 7-day regimen. Resistance to the 5-nitroimidazoles has been reported, and may be one cause of treatment failure.

Patients not cured with the repeated course of metronidazole may be treated with a regimen consisting of metronidazole 2 g orally, daily, together with 500 mg applied intravaginally each night for 3-7 days. Vaginal preparations of metronidazole are available in many parts of the world, but are only recommended for the treatment of refractory infections, not for the primary therapy of trichomoniasis. An alternative regimen consists of 400 or 500 mg metronidazole orally, twice daily for 7 days.

TRICHOMONIASIS IN PREGNANCY
There is increasing evidence of an association between infection with T. vaginalis and adverse pregnancy outcomes (e.g. premature rupture of the membranes, low birth weight). Metronidazole is not recommended for use in the first trimester of pregnancy, though it can be used during the second and third trimesters. The minimum effective dose (2 g orally, in a single dose) should be used.

Data on the safety of metronidazole in pregnancy are limited and some countries (USA, Canada) recommend use of single dose metronidazole at any time during pregnancy. This is especially relevant in the case of trichomoniasis, where early treatment has the best chances of preventing adverse pregnancy outcomes.
Neonatal infections
Infants with symptomatic trichomoniasis or with urogenital colonization persisting past the fourth month of life should be treated with metronidazole.

Recommended regimen
- metronidazole, 5 mg/kg orally, 3 times daily for 5 days.

Trichomonas vaginalis urethritis
Recommended regimen
- metronidazole, 400 or 500 mg orally, twice daily for 7 days
  OR
- tinidazole, 500 mg, orally twice daily for 5 days.

3.10. BACTERIAL VAGINOSIS
Bacterial vaginosis is a clinical syndrome resulting from replacement of the normal hydrogen peroxide (H₂O₂)-producing Lactobacillus sp. in the vagina with high concentrations of anaerobic bacteria, such as G. vaginalis and Mycoplasma hominis. The cause of the microbial alteration is not fully understood.

Whereas trichomoniasis is a sexually transmitted infection, bacterial vaginosis is an endogenous reproductive tract infection. Treatment of sexual partners has not been demonstrated to be of benefit. It is recommended that predisposing factors such as the use of antiseptic/antibiotic vaginal preparations or vaginal douching be reduced or eliminated.

Additional studies are needed to confirm the relationship between an altered vaginal microflora and the acquisition of HIV.

The current recommendation is to only treat symptomatic women.

Recommended regimen
- metronidazole, 400 or 500 mg orally, twice daily for 7 days

Note
Patients taking metronidazole should be cautioned not to consume alcohol while they are taking the drug and up to 24 hours after taking the last dose.
Alternative regimens
- metronidazole, 2 g orally, as a single dose
  OR
- clindamycin vaginal cream 2%, 5 g at bedtime intravaginally for 7 days
  OR
- metronidazole gel 0.75%, 5 g twice daily intravaginally for 5 days
  OR
- clindamycin, 300 mg orally twice daily for 7 days.

Follow-up
Patients should be advised to return if symptoms persist as re-treatment may be needed.

BACTERIAL VAGINOSIS AND SURGICAL PROCEDURES
Women with bacterial vaginosis, scheduled to undergo reproductive tract surgery or a therapeutic abortion, should receive treatment with metronidazole.

BACTERIAL VAGINOSIS IN PREGNANCY
There is evidence that bacterial vaginosis is associated with an increased incidence of adverse pregnancy outcomes (e.g., premature rupture of membranes, pre-term delivery and low birth weight). Symptomatic pregnant women should be treated, and those with a history of previous pre-term delivery should be screened to detect asymptomatic infections. Pregnant women with recurrence of symptoms should be re-treated. Screening of asymptomatic pregnant women without a history of prior pre-term delivery is not recommended.

Metronidazole is not recommended for use in the first trimester of pregnancy, but it may be used during the second and third trimesters. Lower doses of metronidazole are recommended throughout pregnancy, to reduce the risks of any adverse effects.

Recommended regimen
- metronidazole, 200 or 250 mg orally three times daily for 7 days.
Alternative regimens

- metronidazole, 2 g orally, as a single dose
  OR
- clindamycin, 300 mg orally twice daily for 7 days
  OR
- metronidazole gel, 0.75%, 5 g twice daily intravaginally for 7 days.

3.11. CANDIDIASIS

Vulvo-vaginal candidiasis usually is not acquired through sexual intercourse. Although treatment of sexual partners is not recommended it may be considered for women who have recurrent infection. A minority of male sex partners may have balanitis, which is characterised by erythema (redness) of the glans penis.

VULVOVAGINAL CANDIDIASIS

Therapy generally involves topical use of any of a wide variety of imidazoles (e.g. miconazole, clotrimazole, econazol, butoconazole, terconazole) or nystatin. Imidazoles require shorter courses of treatment and appear to be more effective than nystatin. They are generally more expensive, though.

Recommended regimens

- miconazole or clotrimazole, 200 mg intravaginally, daily for 3 days
  OR
- clotrimazole, 500 mg intravaginally, as a single dose
  OR
- fluconazole, 150 mg orally, as a single dose.

Alternative regimen

- nystatin, 100 000 IU intravaginally, daily for 14 days

VULVOVAGINAL CANDIDIASIS IN PREGNANCY

Although there are now some effective single dose oral treatments, they are not known to be safe or effective. Only topical azoles should be used to treat pregnant women. Of those treatments that have been investigated for use during pregnancy, the most effective are miconazole, clotrimazole, butoconazole and terconazole.
Recurrences

It is recommended that predisposing factors such as antibiotic use, the use of antiseptic/antibiotic vaginal preparations or vaginal douching be reduced or eliminated. Simultaneous treatment of a rectal focus with oral nystatin or fluconazole is not useful in preventing recurrences. Other underlying factors for recurrent vulvovaginal candidiasis include uncontrolled diabetes mellitus, immunosuppression, and corticosteroid use.

VULVOVAGINAL CANDIDIASIS AND HIV INFECTION

Candidiasis at several sites, including the vulva and vagina, is an important correlate of HIV disease. It is often quite severe and frequently relapses. Prolonged treatment is generally required, and chronic suppressive therapy is frequently employed.

BALANOPPOSTHITIS

Topical application of a nystatin or clotrimazole lotion of cream twice daily for 7 days.

3.12. SCABIES

Scabies is often sexually transmitted in adults. However, there clearly are situations in which scabies is transmitted through close body contact not related to sexual activities. This is true in circumstances in which people are living in very close quarters such as in schools, poor housing complexes and in institutions such as nursing homes and psychiatric hospitals. The labelling of scabies as a sexually transmitted infection should be avoided when the likely cause is close body contact, in order to prevent stigmatization. In addition, the management recommendations are different for patients presenting with sexually acquired scabies (i.e. young adult living in good housing conditions). Management of such patients should include treatment of all sexual partners. For outbreaks of scabies related to non-sexual close body contact, treatment of all people involved is critical.

Adults, adolescents and older children: recommended regimen

- lindane 1% lotion or cream applied thinly to all areas of the body from the neck down and washed off thoroughly after 8 hours.
  OR
- permethrin cream (5%)
  OR
- benzyl benzoate 25%, lotion, applied to the entire body from the neck down, nightly for 2 nights; patients may bathe before reapplying the drug and should bathe 24 hours after the final application
crotamiton 10%, lotion, applied to the entire body from the neck down, nightly for 2 nights and washed off thoroughly 24 hours after the second application; an extension to 5 nights is found necessary in some geographical areas (crotamiton has the advantage of an antipruritic action).

**OR**

sulphur 6%, in petrolatum applied to the entire body from the neck down, nightly for 3 nights; patients may bathe before reapplying the product and should bathe 24 hours after the final application.

**Note**

- Lindane is not recommended for pregnant or lactating women.
- Resistance to Lindane has been reported in some areas.

**Infants, children under 10 years of age, pregnant or lactating women**

**Recommended regimen**

- crotamiton 10%, as above
  
  **OR**
  
  sulphur 6%, as above
  
  **OR**
  
  permethrin 5%, cream, applied in the same way as the sulphur regimen described above.

**Contacts**

Sexual contacts and close household contacts should be treated as above.

**Special considerations**

Pruritus may persist for several weeks after adequate therapy. A single treatment after 1 week may be appropriate if there is no clinical improvement. Additional weekly treatments are warranted only if live mites can be demonstrated. If reinfection can be excluded and compliance assured, topical anti-inflammatory therapy may be considered as an allergic reaction may be the reason for clinical manifestation.

Clothing or bed linen that may have been contaminated by the patient in the 2 days prior to the start of treatment should be washed and well dried, or dry-cleaned.
3.13. PHTHIRIASIS (PEDICULOSIS PUBIS)

Recommended regimens

- lindane, 1% lotion or cream, rubbed gently but thoroughly into the infested area and adjacent hairy areas and washed off after 8 hours; as an alternative, lindane (1%) shampoo, applied for 4 minutes and then thoroughly washed off,

  OR

- pyrethrins plus piperonyl butoxide: applied to the infested and adjacent hairy areas and washed off after 10 minutes; retreatment is indicated after 7 days if lice are found or eggs are observed at the hair-skin junction. Clothing or bed linen that may have been contaminated by the patient in the two days prior to the start of the treatment should be washed and well dried, or dry cleaned.

  OR

- permethrin 1% as above.

Note

Lindane is not recommended for pregnant or lactating women.

Special considerations

Pediculosis of the eyelashes should be treated by the application of an occlusive ophthalmic ointment to the eyelid margins daily for 10 days to smother lice and nits. The ointment should not be applied to the eyes.