Chapter 15

GENITAL TRACT INFECTIONS

SUMMARY

MALE GENITAL TRACT INFECTIONS	
Acute urethritis	Ceftriaxone 250 mg IM as a single dose **AND** Azithromycin 1 g PO as a single dose OR Ceftriaxone 250 mg IM as a single dose **AND** Doxycycline 100 mg PO 12 hourly for 7 days
Epididymo-orchitis STI associated Risk factors: < 35 years, sexually active	Ceftriaxone 250 mg IM as a single dose **AND** Azithromycin 1 g PO as a single dose OR Ceftriaxone 250 mg IM as a single dose **AND** Doxycycline 100 mg PO 12 hourly for 10 days
Epididymo-orchitis Uropathogens e.g. *E.coli* Risk factors: > 35 years, low risk sexual activity	Ciprofloxacin 500 mg PO 12 hourly for 10–14 days OR Ciprofloxacin 400 mg IV 12 hourly for 10–14 days OR Levofloxacin 750 mg PO or IV daily for 10–14 days
Acute prostatitis Uncomplicated with risk for STI	Ceftriaxone 250 mg IM as a single dose **AND** Doxycycline 100 mg PO 12 hourly for 10 days
Acute prostatitis Uncomplicated and low risk for STI	Ciprofloxacin 500 mg PO 12 hourly for 10–14 days* OR Levofloxacin 750 mg PO daily for 10–14 days* OR Cotrimoxazole 1 DS tablet PO 12 hourly for 10–14 days* *Some authorities recommend treatment for 4–6 weeks due to reduced antibiotic penetration.
Chronic prostatitis	Ciprofloxacin 500 mg PO 12 hourly for 4–6 weeks OR Levofloxacin 750 mg PO daily for 4 weeks OR Cotrimoxazole 1 DS tablet PO 12 hourly for 1–3 months

FEMALE GENITAL TRACT INFECTIONS	
Vaginal trichomoniasis	Metronidazole 400 mg PO 12 hourly for 7 days OR Metronidazole 2 g PO as a single dose OR Tinidazole 2 g PO as a single dose
Bacterial vaginosis	Metronidazole 400 mg PO 12 hourly for 7 days OR Metronidazole 2 g PO as a single dose OR Clindamycin 2% vaginal cream 5 g daily for 7 days (pregnant women)
Endocervicitis	Ceftriaxone 250 mg IM as a single dose **AND** Azithromycin 1 g PO as a single dose OR Ceftriaxone 250 mg IM as a single dose **AND** Doxycycline 100 mg PO 12 hourly for 7 days
Candida (non-pregnant)	Clotrimazole 500 mg vaginal tablet as a single dose OR Clotrimazole 2 x 100 mg vaginal tablet nocte for 3 nights OR Clotrimazole 2% vaginal cream nocte for 6 nights OR Fluconazole 150 mg PO as a single dose
Candida (pregnant women)	Topical clotrimazole as above: treat for 7 days
Candida (recurrent infection)	Fluconazole 150 mg PO every 3 days for 3 doses OR Fluconazole 150 mg PO weekly for 6 months OR Clotrimazole 500 mg vaginal pessary weekly for 6 months
Pelvic inflammatory disease Outpatient treatment	Ceftriaxone 250 mg IM as a single dose **AND** Doxycycline 100 mg PO 12 hourly for 14 days **AND** Metronidazole 400 mg PO 12 hourly for 14 days OR Cefoxitin 2 g IM as a single dose **AND** Doxycycline 100 mg PO 12 hourly for 14 days **AND** Metronidazole 400 mg PO 12 hourly for 14 days

Pelvic inflammatory disease Inpatient treatment	Cefoxitin 2 g IV 6 hourly **AND** Doxycycline 100 mg PO 12 hourly until clinical improvement FOLLOWED BY Doxycycline 100 mg PO 12 hourly **AND** Metronidazole 400 mg PO 12 hourly to complete 10–14 days' treatment **Alternative** Clindamycin 900 mg IV 8 hourly **AND** Gentamicin 4–6 mg/kg IV once daily until clinical improvement FOLLOWED BY Doxycycline 100 mg PO 12 hourly **AND** Metronidazole 400 mg PO 12 hourly to complete 10–14 days' treatment

GENITAL INFECTIONS: MALE AND FEMALE	
DISEASES CHARACTERISED BY GENITAL, ANAL, OR PERIANAL ULCERS	
Chancroid	Ceftriaxone 250 mg IM as a single dose OR Azithromycin 1 g PO as a single dose OR Ciprofloxacin 500 mg PO 12 hourly for 3 days
Primary genital HSV	Acyclovir 400 mg PO 8 hourly for 7–10 days OR Valacyclovir 1 g PO 12 hourly 7–10 days
Recurrent genital HSV: episodic treatment	**HIV-uninfected** Acyclovir 800 mg PO 8 hourly for 2 days OR Valacyclovir 500 mg PO 12 hourly for 3 days OR Valacyclovir 1 g PO once a day for 5 days **HIV-infected** Acyclovir 400 mg PO 8 hourly for 5–10 days OR Valacyclovir 1 g PO 12 hourly for 5–10 days

Recurrent genital HSV: suppressive treatment	**HIV-uninfected** Acyclovir 400 mg PO 12 hourly for 6 months OR Valacyclovir 500 mg PO once a day* for 6 months OR Valacyclovir 1 g PO once a day for 6 months *May be less effective with very frequent recurrences (i.e. ≥ 10 episodes per year) **HIV-infected patients** Acyclovir 400–800 mg PO 8–12 hourly for 6 months OR Valacyclovir 500 mg PO 12 hourly for 6 months **In pregnancy (starting at 36 weeks of gestation)** Acyclovir 400 mg PO 8 hourly OR Valacyclovir 500 mg PO 12 hourly
Granuloma inguinale	Doxycycline 100 mg PO 12 hourly for 3–4 weeks OR Azithromycin 1 g PO weekly for 3 weeks OR Cotrimoxazole 1 DS tablet PO 12 hourly for 3 weeks
Lymphogranuloma venereum	Doxycycline 100 mg PO 12 hourly for 21 days OR Azithromycin 1 g PO weekly for 3 weeks (clinical trials lacking)
Syphilis: primary or secondary	Benzathine benzylpenicillin G 2.4 MU IM as a single dose OR Doxycycline 100 mg PO 12 hourly for 14 days
Syphilis: late or tertiary (excluding neurosyphilis)	Benzathine benzylpenicillin 2.4 MU IM weekly for 3 weeks OR Doxycycline 100 mg PO 12 hourly for 28 days
Neurosyphilis	Benzylpenicillin G 3–4 MU IV 4 hourly for 10–14 days OR Benzylpenicillin G 18–24 MU by continuous IV infusion for 10–14 days **Alternative** Procaine penicillin 2.4 MU IM daily for 10–14 days **AND** Probenecid 500 mg PO 6 hourly for 10–14 days
Congenital syphilis	Benzylpenicillin G 100 000–150 000 U/kg/day IV in 2 divided doses for 10 days OR Procaine penicillin G 50 000 U/kg IM daily for 10 days

INTRODUCTION

The goals of therapy for sexually transmitted infections (STIs) include the elimination of the causative pathogen, resolution of the lesions and the symptoms, reduction in the risk of transmission, prevention of complications and if applicable, a reduction in the frequency of recurrences. Always take a comprehensive history, including a sexual history and examine the patient carefully. Always perform counselling and testing for HIV, hepatitis B and C and discuss and provide contraception including condoms.

Where possible, a definitive laboratory diagnosis should be established since:

- Aetiological diagnosis on the grounds of clinical examination is unreliable.
- Multiple pathogens may be present.
- Antibiotic resistance is common.
- Investigation and treatment of the sexual partner is invariably necessary.

A 'syndromic' approach to therapy can be adopted while waiting for a definitive laboratory diagnosis or in situations where laboratory confirmation is not possible.

ACUTE URETHRITIS IN MEN

	CAUSES
Common	*Neisseria gonorrhoeae*, *Chlamydia trachomatis*
Less common	*Mycoplasma genitalium/hominis*, *Ureaplasma urealyticum/parvum*, *Trichomonas vaginalis*, herpes simplex virus
Non-infectious	Atrophic urethritis in elderly, foreign bodies, soaps, Reiter's syndrome

Clinically patients present with burning on urination, urethral discomfort or itching, and urethral discharge. Both local (e.g. epididymitis) and systemic (e.g. disseminated gonorrhoea) complications should be excluded. There is significant overlap between the clinical spectrum of gonococcal infection and non-gonococcal urethritis, therefore laboratory testing to determine the definitive diagnosis is recommended.

CAUSES	LABORATORY TESTS RECOMMENDED
Neisseria gonorrhoeae	First-void urine or urethral swab for MC&S First-void urine or urethral swab for PCR
Chlamydia trachomatis	First-void urine or urethral swab for PCR
Trichomonas vaginalis	First-void urine or urethral swab for microscopy (wet mount and special stains) First-void urine or urethral swab for PCR
Mycoplasma genitalium/ hominis	First-void urine or urethral swab for culture or PCR
Ureaplasma urealyticum/parvum	First-void urine or urethral swab for culture or PCR

Herpes simplex virus	Dry swab from lesion for PCR
Urinary tract infection	Pre-treatment midstream urine for MC&S and blood cultures (if indicated)

TREATMENT

Treatment should ideally be based on the culture and susceptibility results. Sexual partners of patients with a urethral discharge must receive treatment simultaneously.

CEPHALOSPORIN RESISTANCE

Cephalosporin-resistant *Neisseria gonorrhoeae* are increasing and thus monitoring patients for the resolution of symptoms is required. A persistent urethral discharge for > 7 days may indicate resistance which requires second-line treatment.

NOT RECOMMENDED

- For empiric oral therapy: oral cefixime is not recommended due to increasing *Neisseria gonorrhoeae* resistance; it has been replaced by intramuscular ceftriaxone.
- *For Neisseria gonorrhoeae:* Ciprofloxacin 500 mg PO, as a single dose as an alternative to ceftriaxone is not recommended due to resistance unless a sensitive strain has been identified.

EMPIRIC TREATMENT: ACUTE MALE URETHRITIS

FIRST-LINE TREATMENT

Ceftriaxone* 250 mg IM as a single dose **AND**

Azithromycin 1 g PO as a single dose

OR

Ceftriaxone* 250 mg IM as a single dose **AND**

Doxycycline 100 mg PO 12 hourly for 7 days

If the female sexual partner has a vaginal discharge: add metronidazole 2 g PO as a single dose.

*For severe penicillin allergic patients omit the ceftriaxone and increase the azithromycin to 2 g PO as a single dose.

SECOND-LINE TREATMENT (FOR FAILURE OF FIRST-LINE TREATMENT)

Ceftriaxone* 1g IM as a single dose **AND**

Azithromycin 2 g PO as a single dose **AND**

Metronidazole 2 g PO as a single dose – if not already given.

* For severe penicillin-allergic patients omit ceftriaxone and substitute with gentamicin 240 mg IM as a single dose.

EPIDIDYMO-ORCHITIS

	CAUSES
Men younger than 35 years, or risk factors for an STI	*Chlamydia trachomatis* *Neisseria gonorrhoeae*
Men older than 35 years, no risk factors for an STI	Uropathogens, *e.g. Escherichia coli*
Non-infectious	Trauma, autoimmune disease

Clinically patients present with scrotal pain. Laboratory diagnosis is made by urine culture or *Chlamydia trachomatis* PCR and *Neisseria gonorrhoeae* PCR on first-void urine or a urethral swab.

TREATMENT: EPIDIDYMO-ORCHITIS

MEN YOUNGER THAN 35 YEARS OR OTHER RISK FACTORS FOR AN STI

Ceftriaxone 250 mg IM as a single dose **AND**
Azithromycin 1 g PO as a single dose
OR
Ceftriaxone 250 mg IM as a single dose **AND**
Doxycycline 100 mg PO 12 hourly for 10 days

MEN OLDER THAN 35 YEARS WITH NO RISK FACTORS FOR AN STI

Ciprofloxacin 500 mg PO 12 hourly for 10–14 days
OR
Ciprofloxacin 400 mg IV 12 hourly for 10–14 days
OR
Levofloxacin 750 mg PO or IV daily for 10–14 days

PROSTATITIS

ACUTE PROSTATITIS	CHRONIC PROSTATITIS
• Lower urinary tract symptoms associated with fever, systemic symptoms, perineal pain and exquisite tenderness of the prostate. • Urinary pathogens are usually involved, although sexually transmitted pathogens may occasionally cause prostatitis.	• Difficult to diagnose as there is little inflammation present and the gland is often normal on clinical examination. • It should be suspected in patients with recurrent lower urinary tract infection with the same organism. • Few antibiotics penetrate the non-inflammed prostate.

For laboratory diagnosis, urine should be collected following prostatic massage and sent for MC&S.

EMPIRIC TREATMENT: ACUTE PROSTATITIS

REGIMENS FOR MILD INFECTION

Ciprofloxacin 500 mg PO 12 hourly for 10–14 days

OR

Levofloxacin 750 mg PO given daily for 10–14 days

OR

Cotrimoxazole 1 DS tablet PO 12 hourly for 10–14 days

IF AT RISK FOR A STI, TREAT WITH:

Ceftriaxone 250 mg IM stat **AND**

Doxycycline 100 mg PO 12 hourly for 14 days

Urine culture is necessary in the initial workup, and repeated 10–14 days after completion of treatment.

Some authorities recommend treating for 4–6 weeks due to possible microabscesses and poor antibiotic penetration.

TREATMENT: CHRONIC PROSTATITIS

Ciprofloxacin 500 mg PO 12 hourly for 4–6 weeks

OR

Levofloxacin 750 mg PO given once daily for 4 weeks

OR

Cotrimoxazole 1 DS tablet PO 12 hourly for 1–3 months

NOTE

Due to increasing rates of E. coli quinolone and cotrimoxazole resistance, urine culture and sensitivity testing is essential to guide appropriate antibiotic therapy for men with prostatitis. In addition, increasing rates of ESBLs and Pseudomonas infections are a concern. Oral fosfomycin at a dose of 3 g daily is increasingly being used, either alone or in combination with another antibiotic, to treat multi-drug resistant cases of acute and chronic prostatitis.

FEMALE GENITAL SCHISTOSOMIASIS

Schistosomiasis (bilharzia) may affect the genital tract of both men and women due to eggs being transmitted to the genital tract via pelvic blood vessel anastomoses, and is typically caused by *S. haematobium*. Female genital schistosomiasis (FGS) can affect the fallopian tubes, uterus and vagina and is significantly under-diagnosed in clinical practice with studies showing FGS prevalence of ~33%–75% in endemic areas. Genital itch, vaginal discharge, stress incontinence and infertility are common presentations of FGS. Gynaecological examination may demonstrate so-called 'sandy patches' in the mucosa with abnormal blood vessels, contact bleeding, oedema and erosions. A diagnosis of FGS is usually made on clinical grounds and can be supported by histological findings and/or PCR on urine, stool or vaginal lavage specimens.

Refer to the chapter "Common worm infestations in South Africa" for further information on schistosomiasis and its treatment.

VAGINAL DISCHARGES

Patients may present with a vaginal discharge, vulval itching or burning and dysuria. The discharge may arise from the vaginal wall (true vaginitis) or the endocervix (endocervicitis). An abnormal vaginal discharge is defined as a discharge of increased volume, abnormal consistency and

abnormal colour, e.g. yellow. It is important to determine the relationship of the discharge to the menstrual cycle. The physical examination should be focused and based on the results of the medical history and includes inspection of the external genitalia, peri-rectal region, and vulva for evidence of lesions, ulceration and erythema. Conduct a speculum examination to inspect the vaginal mucosa and cervix, and look for sources of secretions, i.e. try to establish whether the discharge is cervical or vaginal in origin.

BOTH INFECTIOUS AND NON-INFECTIOUS CAUSES FOR THE DISCHARGE SHOULD BE CONSIDERED:

- From the vaginal wall: *Trichomonas vaginalis*, *Candida albicans*, *Gardnerella vaginalis*
- From the cervix: *Neisseria gonorrhoeae* and *Chlamydia trachomatis*
- Non-infectious: Cervical carcinoma, retained foreign body, allergic vaginitis, atrophic vaginitis, uterine fibroids and uterine carcinoma

Laboratory tests are often warranted since there is considerable overlap of symptoms between the different causes of vaginal discharge.

VAGINITIS

NOT NORMALLY PRESENT IN THE VAGINA	
CAUSES	**LABORATORY TESTS RECOMMENDED**
Trichomonas vaginalis	High vaginal swab for microscopy (and/or culture or PCR)
NORMAL VAGINAL FLORA	
CAUSES	**LABORATORY TESTS RECOMMENDED**
Candida albicans	High vaginal swab for fungal microscopy and culture
Gardnerella vaginalis	High vaginal swab for microscopy and culture 'Whiff' test by addition of KOH

Candida albicans causes 80–90% of vulvovaginal candidiasis. Non-albicans infections are often associated with recurrent disease, and are less susceptible to topical imidazoles. Consider vaginal candidiasis and/or bacterial vaginosis in women < 35 years of age with no recent history of sexual intercourse and a male partner who does not have a urethral discharge.

℞ **TREATMENT: VAGINAL CANDIDIASIS AND BACTERIAL VAGINOSIS**

Metronidazole 400 mg PO 12 hourly for 7 days OR Metronidazole 2 g PO as a single dose
AND (any one of the following)
Clotrimazole 500 mg vaginal tablet/cream PV nocte as a single dose
OR
Clotrimazole 2 x 100 mg vaginal tablets PV nocte for 3 nights
OR
Clotrimazole 5 g (1 applicator) vaginal cream PV nocte for 6 nights
OR
Fluconazole 150 mg PO as a single dose
OR
Itraconazole 200 mg PO 12 hourly for 2 doses

RECURRENT CANDIDIASIS

Fluconazole 150 mg PO every 3 days for three doses
FOLLOWED BY (any one of the following)
Fluconazole 150 mg PO given weekly for 6 months OR
Clotrimazole 500 mg vaginal tablet/cream PV nocte weekly for 6 months

CANDIDIASIS: PREGNANT WOMEN

Topical imidazoles (clotrimazole, miconazole, tioconazole or terconazole) for 7 days
Oral azole antifungal agents should not be used during pregnancy

BACTERIAL VAGINOSIS: PREGNANT WOMEN

2% clindamycin lotion: 5 g PV nocte for 7 days
Treatment of sexual partners is also recommended to prevent reinfection

ENDOCERVICITIS

CAUSES	LABORATORY TESTS RECOMMENDED
Neisseria gonorrhoeae	Cervical or a high vaginal swab for MC&S Cervical swab or first void urine for PCR
Chlamydia trachomatis	Cervical swab or first void urine for PCR

Endocervicitis should be considered in women with a recent sexual partner, a sexual partner with a urethral discharge and age > 35 years. Treatment is as for urethritis in men.

EMPIRIC TREATMENT: ENDOCERVICITIS

Ceftriaxone* 250 mg IM as a single dose **AND**
Azithromycin 1 g PO as a single dose
OR
Ceftriaxone* 250 mg IM as a single dose **AND**
Doxycycline 100 mg PO 12 hourly for 7 days
*For severe penicillin-allergic patients omit ceftriaxone and increase the azithromycin to 2 g PO as a single dose.
Sexual partners should also be treated unless shown to be free from infection.

PELVIC INFLAMMATORY DISEASE

Pelvic inflammatory disease (PID) may be caused by sexually transmitted infections or ascending infection with endogenous vaginal microbial flora following mechanical disruption of the normal cervical barrier e.g. post-partum, post-operative or post IUCD insertion. The organisms usually implicated include *Neisseria gonorrhoeae*, *Chlamydia trachomatis,* Enterobacteriaceae, *Streptococcus* spp., and anaerobes.

The spectrum of PID includes endometritis (including postpartum), chorioamnionitis, intra-amniotic syndrome, salpingitis, tubo-ovarian abscess, and/or pelvic cellulitis and/or pelvic peritonitis. Clinical diagnosis of acute PID is imprecise, with a positive predictive value of ~65–90% compared to laparoscopy. Given the often subtle presentation of this disease and the significant reproductive sequelae (infertility, ectopic pregnancy, chronic pelvic pain), clinicians should maintain a low threshold for the diagnosis of PID. Male sexual partners should also be evaluated.

HOSPITALISATION IS RECOMMENDED WHEN:

- The diagnosis is uncertain.
- The possibility of surgical emergencies such as appendicitis or ectopic pregnancy cannot be excluded.
- A pelvic abscess is suspected.
- The patient is pregnant.
- The patient is an adolescent.
- Severe illness precludes outpatient management.
- The patient has not responded to outpatient therapy.
- Clinical follow-up cannot be arranged within 72 hours of the initiation of antibiotic treatment.

SPECIMEN	LABORATORY TESTS RECOMMENDED
Endocervical specimens or first-void urine	*Neisseria gonorrhoeae* PCR and *Chlamydia trachomatis* PCR
If culdocentesis is performed	Pus in a syringe for MC&S
Other	Blood for pregnancy test Severe cases: blood cultures prior to starting treatment

TREATMENT

Even with sexually transmitted infections, the resultant upper genital tract infection is usually polymicrobial with mixed STI pathogens and endogenous flora, and hence empiric treatment needs to be broad spectrum and include cover for anaerobes. Intrauterine contraceptive devices, if present, should be removed once antimicrobial treatment has begun.

Empiric treatment for PID should be considered in sexually active women if the following minimum criteria are met and no other cause for the illness can be identified:

- Pelvic organ tenderness noted on bimanual examination with or without manipulation of the cervix
- Microscopy showing the presence of white blood cells in vaginal secretions
- Additional criteria:
  - Bacterial vaginosis, mucopurulent cervicitis
  - Laboratory detection of *N. gonorrhoeae* or *C. trachomatis*
  - Pyrexia of higher than 38°C

EMPIRIC TREATMENT: PID (OUTPATIENTS)

Ceftriaxone 250 mg IM as a single dose **AND**
Doxycycline 100 mg PO 12 hourly for 14 days **AND**
Metronidazole 400 mg PO 12 hourly for 14 days
OR
Cefoxitin 2 g IM as a single dose **AND**
Doxycycline 100 mg PO 12 hourly for 14 days **AND**
Metronidazole 400 mg PO 12 hourly for 14 days

TREATMENT: PID (INPATIENTS)

Cefoxitin 2 g IV 6 hourly **AND**

Doxycycline 100 mg PO 12 hourly until clinical improvement

FOLLOWED BY

Doxycycline 100 mg PO 12 hourly **AND**

Metronidazole 400 mg PO 12 hourly to complete 10–14 days' treatment

Alternative

Clindamycin 900 mg IV 8 hourly **AND**

Gentamicin 4–6 mg/kg IV once daily until clinical improvement

FOLLOWED BY

Doxycycline 100 mg PO 12 hourly **AND**

Metronidazole 400 mg PO 12 hourly to complete 10–14 days' treatment

- Parenteral therapy is continued for at least 48 hours after the occurrence of substantial clinical improvement, after which oral doxycycline and metronidazole should be given until day 14 of treatment.
- If a tubo-ovarian abscess is present, either clindamycin 450 mg PO 6 hourly OR metronidazole 400 mg PO must be added to doxycycline for 14 days.

PELVIC ACTINOMYCOSIS

Actinomyces is part of the normal flora of the gastrointestinal tract and is commonly present in normal vaginal flora. Cervical cytology (Pap smears) commonly report the presence of actinomyces-like organisms when an IUCD is in situ. Identification of actinomyces in the vagina or cervix is not diagnostic of disease and is not predictive of the development of disease. There are, however, case reports of endometritis, pelvic inflammatory disease, pelvic abscess, and retroperitoneal fibrosis associated with actinomyces in IUCD users.

In asymptomatic women a full examination should be performed and if there are no signs or symptoms, the Pap smear finding probably represent colonisation. There is no evidence to support antibiotics or IUCD removal.

In symptomatic women with signs or symptoms of pelvic infection (pelvic mass or pain, uterine tenderness) antibiotics should be administered followed by removal of the IUCD, as actinomyces preferentially grows on foreign bodies. Therapy is individualised, depending on the initial burden of disease and the clinical and radiological responses to antibiotics. Oral antibiotics may be adequate treatment for a very early, local infection. Intravenous and prolonged therapy (weeks to months) is indicated for a tubo-ovarian abscess or disseminated infection; surgery may also be necessary. Women must be counselled against future IUCD use.

TREATMENT: EARLY, LOCALISED ACTINOMYCOSIS (OUTPATIENTS)

Penicillin VK 500 mg PO 6 hourly for 14 days

OR

Doxycycline 100 mg PO 12 hourly for 14 days

TREATMENT: ACTINOMYCOSIS-TUBO-OVARIAN ABSCESS OR DISSEMINATED INFECTION (INPATIENTS)

Ampicillin 50 mg/kg/day IV in 3–4 divided doses for 4–6 weeks OR

Penicillin G 10–20 MU/day IV as a continuous infusion or divided doses given 4 hourly for 4–6 weeks

FOLLOWED BY:

Penicillin VK 2–4 g/day PO in divided doses for 3–6 months

GENITAL ULCERATION

	CAUSES
Common	Herpes simplex virus, syphilis
Less common	Chancroid, lymphogranuloma venereum (LGV), granuloma inguinale, tuberculosis, amoebiasis
Non-infectious	Neoplastic ulcer, fixed drug reaction, Behçet's syndrome, trauma

A genital ulcer can occur as a penile ulcer or scrotal ulcer in males and as a vaginal or vulval ulcer in females. To establish the correct diagnosis, laboratory testing is required as there are considerable variation and overlap in the clinical presentation and co-infections with more than one organism may occur. The minimum recommended laboratory investigations include evaluating for herpes simplex virus, syphilis, HIV, hepatitis B and hepatitis C.

CAUSE	LABORATORY TESTS RECOMMENDED
Herpes simplex virus	Dry swab from lesion for HSV PCR
Syphilis (*Treponema pallidum*)	Serum for syphilis serology
Chancroid (*Haemophilus ducreyi*)	Swab of genital ulcer or tissue for *H. ducreyi* PCR (test of choice) Swab of genital ulcer or tissue for culture: not widely available with poor sensitivity (fastidious organism)
Lymphogranuloma venereum (*Chlamydia trachomatis*)	Swab of genital ulcer or bubo aspirate for *Chlamydia trachomatis* PCR Chlamydia serology has limitations since a positive test does not distinguish recent from past exposure and between the different serotypes
Granuloma inguinale (*Klebsiella granulomatis*)	Biopsy, or aspirate of lesion for microscopy (including special stains) or histology of a biopsy for intracellular bacteria Culture is not used for diagnostic purposes

EMPIRIC TREATMENT: GENITAL ULCERATION

Benzathine benzylpenicillin G* 2.4 MU IM as a single dose

AND

Acyclovir 400 mg PO 8 hourly for 7 days

*If penicillin allergic use doxycycline 100 mg PO 12 hourly for 14 days

If the ulcer fails to heal after 7 days then add azithromycin 1 g PO as a single dose

GENITAL HERPES SIMPLEX VIRUS

Refer to the chapter "Treatment of common viral infections".

SYPHILIS

- **Primary and secondary syphilis:** Occurs within 12 months of acquisition of infection. The classic presentation of primary syphilis is a painless genital ulcer. Secondary syphilis may present with a diffuse, symmetric macular or papular rash involving the entire trunk and extremities. Condylomata lata, lymphadenopathy, alopecia and hepatitis are also features of secondary syphilis.
- **Latent syphilis:** Asymptomatic syphilis, with positive serology and negative physical examination. Early latent syphilis is latent syphilis where infection occurred within the past 12 months. Late latent syphilis is latent syphilis where infection occurred more than 12 months ago.
- **Tertiary syphilis:** Is rare and develops in a subset of untreated syphilis infections. It can appear 10–30 years after infection was first acquired. Includes gummatous syphilis, cardiovascular syphilis and neurosyphilis. All patients with gummatous or cardiovascular syphilis should have a CSF examination prior to initiation of therapy to assess for neurosyphilis.
- **Congenital syphilis:** Associated with intra-uterine growth restriction, perinatal death, premature delivery, low birth weight, abnormal liver function tests and hepatomegaly, thrombocytopaenia, anaemia and ascites.

LABORATORY DIAGNOSIS

Diagnostic testing for syphilis should be performed on patients with signs or symptoms of infection. In addition, asymptomatic patients should be screened for syphilis if they are at risk of having acquired the infection or of transmitting the infection to others. Laboratory testing is typically performed by means of serological tests. The following syphilis serology tests are available at Ampath laboratories:

NON-TREPONEMAL ASSAYS		
TEST	**SPECIMEN**	**INDICATION**
RPR (Rapid plasma reagin)	Serum	Non-specific screening test Limitations: False-positive results can occur
VDRL (Venereal disease research laboratory)	CSF	Performed for suspected neurosyphilis

TREPONEMAL ASSAYS		
TEST	**SPECIMEN**	**INDICATION**
Polyvalent *T. pallidum* IgM and IgG	Serum	Specific screening test for syphilis
Individual *T. pallidum* IgM and IgG ELISA assays	Serum CSF	Performed if the polyvalent screening test is positive IgG ELISA can be performed on CSF with suspected neurosyphilis
Individual *T. pallidum* IgM and IgG Western blot	Serum CSF	Performed to confirm positive IgM and IgG ELISA results where indicated IgG Western blot can be performed on CSF with suspected neurosyphilis

COMMON SYPHILIS SEROLOGY RESULTS AND THEIR INTERPRETATION

RPR	POLYVALENT IGM + IGG	INTERPRETATION
Positive	Positive	Current syphilis infection. Stage clinically IgM antibodies are seen in primary and secondary syphilis and may take up to 18 months to become undetectable. IgG antibodies persist lifelong
Positive	Negative	Likely false positive RPR result
Negative	Positive	Previously treated syphilis OR Early syphilis infection prior to RPR positivity OR Latent or tertiary syphilis. Perform additional treponemal tests to confirm. Approximately 1/3rd of patients with tertiary syphilis have a negative RPR.

TREATMENT OF SYPHILIS INFECTION

Patients require repeat serological testing at six and 12 months following therapy, even after lesions heal to verify an adequate therapeutic response (i.e. fourfold decrease in the RPR titres). Although some studies have shown efficacy of 2 g oral azithromycin as a single dose, the increasing reports of macrolide resistance have tempered enthusiasm for adopting azithromycin for the treatment of syphilis.

TREATMENT: PRIMARY OR SECONDARY SYPHILIS

ADULTS

Benzathine benzylpenicillin* G 2.4 MU IM as a single dose (3 doses at weekly intervals if pregnant)

*For patients allergic to penicillin use doxycycline 100 mg PO 12 hourly for 14 days

*If penicillin-allergic and pregnant, refer for penicillin desensitisation

CHILDREN

Benzathine benzylpenicillin 50 000 U/kg (up to 2.4 MU) IM as a single dose

TREATMENT: LATE SYPHILIS

Benzathine benzylpenicillin G* 2.4 MU IM weekly for 3 weeks

OR

Doxycycline 100 mg 12 hourly PO for 28 days (patients allergic to penicillin)

*If penicillin-allergic and pregnant, refer for penicillin desensitisation

TREATMENT: TERTIARY SYPHILIS (EXCEPT NEUROSYPHILIS)

Benzathine benzylpencillin G 2.4 MU IM weekly for 3 weeks

OR

Doxycycline 100 mg 12 hourly PO for 28 days

TREATMENT: NEUROSYPHILIS (INCLUDING OCULAR SYPHILIS)

Benzylpenicillin G* 3–4 MU IV 4 hourly or 18–24 MU by continuous infusion for 10–14 days

OR

Procaine penicillin G 2.4 MU IM daily for 10–14 days **AND**

Probenecid 500 mg PO 6 hourly for 10–14 days

*If penicillin allergic, refer for penicillin desensitisation.

In cardiovascular syphilis and neurosyphilis, concomitant treatment with prednisolone or predisone 20 mg PO 12 hourly for 3 doses may be administered initially with penicillin to reduce the likelihood of a Jarish-Herxheimer reaction.

TREATMENT: CONGENITAL SYPHILIS

Benzylpenicillin G 100 000 to 150 000 U/kg/day in two divided doses IV for 10 days

OR

Procaine penicillin G 50 000 U/kg/dose IM as a single daily dose for 10 days

CHANCROID (HAEMOPHILUS DUCREYI)

Chancroid is infrequently identified as a cause of genital ulcer disease. Inguinal lymphadenitis is present in about one-half of infected men, but is somewhat less common in women. The involved nodes may undergo liquefaction and present as fluctuant buboes.

The preferred test for laboratory diagnosis is *H. ducreyi* PCR on an ulcer swab or tissue specimen. Culture is not widely available and has poor sensitivity as it is a fastidious organism.

TREATMENT: CHANCROID

Azithromycin 1 g PO as a single dose (treatment failures have been reported in HIV co-infected patients)

OR

Ceftriaxone 250 mg IM as a single dose

OR

Ciprofloxacin 500 mg PO 12 hourly for 3 days

All sexual partners who have had contact with a patient with chancroid should be treated irrespective of signs and symptoms.

LYMPHOGRANULOMA VENEREUM

Lymphogranuloma venereum (LGV) is a genital ulcer disease caused by the L1, L2, and L3 serovars of *Chlamydia trachomatis.*

Clinical presentation in heterosexuals include tender inguinal and/or femoral lymphadenopathy that may be unilateral or sometimes a self-limiting genital ulcer at the site of inoculation. Women or MSM (men who have sex with men) with rectal exposure may present with proctocolitis mimicking inflammatory bowel disease with mucoid and/or hemorrhagic rectal discharge, anal pain, constipation, fever, and/or tenesmus. Invasive, systemic infection and proctocolitis can lead to chronic colorectal fistulas and strictures. Buboes may require aspiration through intact skin or incision and drainage to prevent the formation of inguinal or femoral ulceration.

Laboratory diagnosis is made by means of a *Chlamydia trachomatis* PCR on a genital ulcer swab or bubo aspirate. Chlamydia serology has limited value since a positive test does not distinguish recent from past exposure and between the different serotypes.

TREATMENT: LYMPHOGRANULOMA VENEREUM

Doxycycline 100 mg PO 12 hourly for 21 days (preferred regimen)

OR

Azithromycin 1 g PO weekly for 3 weeks (clinical trial data lacking)

TREATMENT: SEXUAL PARTNERS

If asymptomatic:

Azithromycin 1 g PO as a single dose

OR

Doxycycline 100 mg PO 12 hourly for 7 days

If symptomatic, then a full treatment course is indicated.

GRANULOMA INGUINALE (DONOVANOSIS)

Granuloma inguinale is a chronic bacterial infection caused by *Klebsiella granulomatis* that is frequently associated with other sexually transmitted diseases. It is characterised by intracellular inclusions in macrophages referred to as Donovan bodies. It usually affects the skin and mucous membranes in the genital region, where it results in nodular lesions that evolve into ulcers. The ulcers progressively expand and are locally destructive.

Laboratory diagnosis is made by biopsy, or aspirate of a lesion for microscopy (including special stains) or histology of a biopsy for intracellular bacteria. Culture is not used for diagnostic purposes.

TREATMENT: GRANULOMA INGUINALE

Doxycycline 100 mg PO 12 hourly for 3–4 weeks (preferred regimen)

OR

Azithromycin 1 g PO weekly for 3 weeks

OR

Cotrimoxazole 1 DS tablet PO 12 hourly for 3 weeks

Treatment should continue until complete epithelialisation has taken place, which may take up to 4 weeks.

ECTOPARASITES

PEDICULOSIS PUBIS (PUBIC LICE)

Pubic lice typically presents with itching in the pubic or genital area. Other parts of the body, such as the armpits can also be itchy if lice are present. There may be pale bluish spots on the lower abdomen, upper thighs or buttocks from repeat feedings in the same area. Lice or eggs can be seen on the pubic hair.

TREATMENT: PUBIC LICE

Benzyl benzoate 25% applied to affected areas and left on for 24 hours and then washed off. Repeat the application after 7 days

OR

Permethrin 1% cream applied to affected areas and washed off after 10 minutes

OR

Pyrethrins with piperonyl butoxide applied to the affected area and washed off after 10 minutes

PEDICULOSIS OF THE EYELIDS

Apply petroleum jelly to the eyelid margins twice daily for 10 days

OTHER

Bedding and clothing should be decontaminated (machine-washed and dried using a heat cycle or dry cleaned) and removed from body contact for at least 72 hours. All sexual partners need to be treated.

SCABIES

Scabies is an infestation of the skin by the mite *Sarcoptes scabiei* that results in an intensely pruritic eruption. Lesions are small, erythematous papules that are often excoriated. Burrows can occasionally be seen. Typical sites that are involved are the sides and webs of the fingers, the wrists, elbows, axilla, skin adjacent to the nipples, the periumbilical areas, waist, male genitalia, lower buttocks and adjacent thighs. Crusted scabies (Norwegian scabies) can occur in patients with compromised cellular immunity such as in AIDS patients. Prominent scale and crust are present and nails can be thickened and discoloured.

The diagnosis is usually made clinically. When in doubt, adhesive transparent tape can be firmly applied directly to a skin lesion, then rapidly pulled off and stuck on a glass slide and sent to the laboratory for microscopy.

TREATMENT: SCABIES

Permethrin 5% cream applied to all of the body from the neck down and washed off after 8–14 hours

OR

Ivermectin 200 μg/kg PO as a single dose followed by a repeat dose 1–2 weeks later

FOR CRUSTED SCABIES COMBINATION THERAPY IS NEEDED

Permethrin 5% cream applied daily for 7 days, then twice weekly until cured **AND**

Ivermectin 200 μg/kg PO given on days 1, 2, 8, 9, and 15

OTHER

Bedding and clothing should be decontaminated (machine-washed and dried using a heat cycle or dry cleaned) and removed from body contact for at least 72 hours. All close contacts should also be treated to reduce the risk of spread to uninfected persons and the recurrence of scabies in the treated patient.

CONDYLOMATA ACUMINATA (ANOGENITAL WARTS)

Refer to the chapter “Treatment of common viral infections”.