Sexually Transmitted Infections Management Guidelines

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PREFACE

Sexually transmitted infections (STIs) constitute an important health threat, both directly and through their potentiating effect on HIV transmission. Failure to diagnose and treat STIs at an early stage may lead to serious complications and sequelae including ectopic pregnancy, fetal wastage, infertility, anogenital cancers as well as neonatal and infant infections.

It is important to maintain services for STI prevention and control as persons with STIs are at increased risk of acquiring or transmitting HIV infection through high-risk sexual behaviours and the co-factor effect of an existing STI. STI services are one of the key entry points for HIV prevention.

In order to provide quality care for STIs, guidelines based on identified patterns of infections must be made available to health care providers. Components of comprehensive STI case management include; making a correct and timely diagnosis, providing effective treatment, reducing/preventing risk behaviour through education, counselling, promoting and providing condoms and ensuring that sexual partners are notified and treated.

In 2000, the National STD/AIDS Control Programme (NSACP) published a guide for the Management of Sexually Transmitted Diseases. Since then, new data from surveillance and research has become available to merit a review and update. The Sri Lanka College of Venereologists (SLCV) undertook the responsibility to revise the STI guidelines. The updated/revised guidelines address sexually transmitted infections in children, management of adult victims of sexual assault, emergency contraception, health education and counselling, and records and reporting thereby providing a more comprehensive tool to address the expanding needs of STI service delivery.

The guidelines are intended to serve as a resource for STI service providers working mainly in settings where laboratory support is available.

The SLCV sincerely appreciates the commitment of those who contributed to this publication. Support from the World Health Organization to the SLCV for this endeavour is gratefully acknowledged.

Dr. Iyanthi Abeyewickreme

Sexually Transmitted Infections
Management Guidelines

Guidelines on management of sexually transmitted infections published by World Health Organization (WHO), British Association for Sexual Health and HIV (BASHH), Centers for Disease Control (CDC) and standard text books were used for reference.

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Sexual history taking

Physical environment

A welcoming, comfortable, confidential and conducive physical environment should be created to facilitate good history taking. Patient consultations should take place in adequate privacy. Presence of students and observers should be allowed only with patient's consent, and if the patient refuses the patient's wish should be respected.

Assure confidentiality

Confidentiality of the patient information has to be maintained in all the times. Seek advice from a consultant in special situations when it is necessary to inform a third party in patient's or other individual's interest.

Preserving the confidentiality of the index patient during consultation is of utmost important in managing the sexual contacts. This can be difficult in certain situations, where a patient attends as a contact of an infected person, but does not know the reason for attendance. The treating clinician should not try to divulge the identity of the index patient even if raised by the sexual contact.

Practice of good communication skills

Good communication skills are important in overall management of the patient. These include both verbal and nonverbal skills. Initial greeting, maintaining eye contact, using appropriate body language and demonstrating non judgmental attitudes, respect and attention to patients are important non verbal communication skills that STD care providers should develop and practice.

Verbal consultation should start with less intrusive questions and then move on to sensitive questions such as sexual behaviour. The presence of anxiety and distress in the patient need to be identified and respond appropriately.

Care should be taken to avoid conflicts between clinician's values and attitudes towards sexuality and different sexual behaviours of the patient.

Components of history taking

Cross check the data entered at registration for their accuracy and consistency.

Note the reason/s for attendance:

- Voluntary – symptomatic, general check up, having other concerns
- Referral – OPD, hospital ward, general practitioner, court, prison, blood bank, medico-legal purpose etc.
- Contacts of STD clinic attendees

Presenting complaint

<u>If symptomatic</u>:

Nature, duration, severity of symptoms, involvement of other relevant sites, similar episodes earlier, any treatment taken, if so details of treatment and the duration , partner/s been symptomatic at present or past.

Due to the possibility of presence of more than one STI, inquire for the presence of other specific genital symptoms as well.

In women:

Contraception - method of contraception and duration of use
Menstrual history - first day of the last menstrual period (LMP),duration, length of the cycle, regular/irregular, post coital bleeding, inter menstrual bleeding

Details of previous pregnancies and their out come

Date of last cervical cytology and results

Sexual history

Taking a proper sexual history is essential in the management of STIs. However discussing very personal issues related to sex and sexuality is challenging as some patients may find some questions offensive. Therefore, the reasons for asking such questions should be clearly explained to all patients as indicated below:

- gender of the partner/s is asked to identify gay/bisexual men in order to take rectal and pharyngeal samples, undertake hepatitis screening and recommend vaccination.
- sites of sexual exposure (oral, vaginal, anal) is asked to identify which sites need to be sampled.
- duration of relationship with the partner/s is asked to facilitate partner notification.

All individuals should be asked about following:

Details last sexual exposure (LSE) - date or period,
gender of the partner,
type of partner -marital/ regular/ casual / CSW,
site/s of exposure,
details of condom use and reasons for not using

Details of previous sexual exposures - during past one month, three months, twelve months and life time.
gender of the partners,
type of partners - marital/ regular/ casual / CSW,
site/s of exposure,
details of condom use and reasons for not using

Details of first sexual exposure - date or age of patient
gender of the partner,
type of partner -marital/ regular/ casual / CSW,
site/s of exposure,
details of condom use and reasons for not using

Details of sexual contacts overseas - date/s or period/s, gender, type, sites of exposure, condom use

In symptomatic patients, attempts should be made to get accurate details of all sexual partners during the incubation period of STIs that may be the cause of the presenting symptom/s. This facilitates effective partner notification and management.

Previous STIs - name/s or symptom/s, date of diagnosis, details of treatment, prior HIV/VDRL/TPPA tests, approximate dates and results

Past medical history

- Past history of transfusing blood or blood products – reason, date/s, within Sri Lanka government or private hospital, overseas - name of the country
- Presence of any other significant illness eg. bronchial asthma
- Current medications, any long term medications
- Allergy to drugs – identify the drug and type of reaction

Social history – occupation, education, residence, details of partner/s, traveled abroad, recreational activities

Substance abuse – substance used, route/s, duration, current use, date of last used

Examination of the patient

Assure privacy
Explain the examination procedure to the patient and get the consent
Carry out a thorough general examination – eyes, mouth, skin (specifically palms and soles), lymph nodes, joints etc.
Do a complete genital examination including the perineal and peri-anal area
Take the appropriate specimens during examination.

Genital examination of a male patient

Adequate exposure is important during clinical examination. Expose the patient preferably from umbilicus to the knees.

Inspection:

Pubic area – ulcers, vesicles, warts, nits, folliculitis, other skin lesions.

Inguinal region – erythema, swelling, ulcers, rashes

Shaft of the penis – any structural abnormality, swelling, rash, ulcers, warts, other lesions

Prepuce – fissuring, ulcers, warts, phimosis, paraphimosis, posthitis, other skin lesions

Glans penis – oedema, ulcers, warts, balanitis, macules, papules, other skin lesions

Coronal sulcus – ulcers, warts, pearly penile papules

Urethral meatus – discharge, oedema, eryhtema, warts, ulcers. If no discharge milk the urethra and look for discharge at the meatus

Scrotum – erythema, skin rash, skin lesions, swelling

Perineal area – ulcers, warts, rash, other skin lesions

Perianal area – discharge, ulcers, warty lesion, rash, other skin lesions, patulous anus, fissures, fistulas, haemorroids

Rectum if indicated – proctoscopic examination to look for oedema, erythema of the rectal mucosa, presence of ulcers, warty lesions, pus, blood

Palpation

During palpation pay attention to the following areas:

Genital ulcers - tenderness, induration

Inguinal region: lymph nodes – size, tender or not, discrete or matted, mobile or fixed ,firm, soft, fluctuant. (rule out hernia)

Spermatic cord – tenderness, thickening, varicocoeles

Epididymis – tenderness, swelling, cysts

Scrotum - palpate the testes and look for consistency, tenderness. rule out hydrocoele, varicocoele, hernia, torsion and testicular tumors in patients with scrotal swelling

Genital examination of a female patient

Woman should be placed in the lithotomy position for genital examination.

Inspection
Abdomen - scars

Pubic area – ulcers, vesicles, warts, pediculosis, folliculitis, other skin lesions.

Inguinal region – erythema, swelling, ulcers, rashes

Labia majora and minora - erythema, oedema, ulcers, warts, fissuring and other skin lesions

Urethral meatus – discharge, warts, furuncle and other lesions

Vaginal introitus – discharge, erythema, warts

Bartholin gland – enlargement, tenderness, duct opening, discharge

Perineal area – ulcers, warts, rash, other skin lesions

Perianal area – discharge, ulcers, warty lesions, rash, other skin lesions, patulous anus, fissures, fistulas, haemorrhoids

Palpation

During palpation pay attention to the following areas:

Lower abdomen – tenderness, guarding and palpable masses

Genital ulcers - tenderness, induration

Inguinal region - lymph nodes – size, tender or not, discrete
or mattered, mobile or fixed, firm, soft, fluctuant.
(rule out hernia)

Bartholian glands – lies in the posterior half of the labia major,
palpable when it is enlarged or fibrotic

Speculum examination-

- Done with patient's consent in women with no intact hymen.
- Check whether the patient has passed urine before inserting the speculum
- Use a sterile speculum
- Wet with clean water before inserting
- Clean the introitus with cotton swabs.
- Insert the speculum preferably handle down-ward to avoid pressing on the sensitive areas like clitoris and urethra.

Inspect the vagina - look for the presence of erythema, warty lesions,
note the nature, quantity, colour and odour of the discharge,
check the PH of discharge

Take the appropriate vaginal specimens as described in the chapter on laboratory diagnosis of STIs

Inspect the cervix - look for the presence of discharge, oedema, erythema, ectopy,
warty lesions, ulcers,

Take the appropriate cervical specimens as described in the chapter on laboratory diagnosis of STIs

Pap test

The best time to schedule the Pap test is between 10 and 20 days after the onset of menstruation.

- If a woman is still menstruating, Pap test should be postponed, and the woman should be advised to have a Pap test at the earliest opportunity.
- If an infection is present preferably treat the infection before performing the test. However, in patients whose follow up is uncertain; Pap test should not be postponed due to the presence of a muco-purulent discharge. The test can be performed after careful removal of the discharge with a saline-soaked cotton swab.
- The sequence of obtaining the Pap smear in relation to collection of other cervico- vaginal specimens does not appear to influence Pap test results or their interpretation.

Therefore, when other cultures or specimens are collected for STD diagnoses, the Pap test can be obtained last.

- Women who have had a hysterectomy, if the cervix is remaining they should receive regularly scheduled Pap tests.
- Pap test can be performed during pregnancy

Making the smear

- Do not use lubricants other than water to moisten the speculum

- Once the speculum is inserted entire transformation zone of the cervix should be visualized

- Place the thinner extended prong (narrow end) of the Ayre's spatula on to the cervical os and rotate the spatula 360 degrees clockwise , gently scraping the entire circumference of the squamo-columnar junction and then a reverse anticlockwise rotation towards the opposite direction should also perform immediately

- Use the broader end of the spatula when sampling patulous or multiparous cervix. A thorough scraping of the whole area of the ectocervix can be obtained by using the broad end of the spatula in backward and forward movement.

- In post menapausal women with no visible transformation zone endocervical brush may be a suitable alternative

- Once the sample is taken, quickly make a thin smear on a glass slide by holding the spatula flatly over the upper half of the glass slide spreading the mucus material evenly in a flat motion.

- If reverse rotation of the spatula is done, make a similar smear on the lower half of the same glass slide using the other side of the spatula
- Large clumps of material should be thinned out carefully avoiding damage to the cells

- Fix immediately with spray or immerse the slide fully in 95% ethanol or isopropyl alcohol.

Once the vaginal and cervical examination and sampling is over, slowly withdraw the speculum and do a bimanual pelvic examination

Bimanual pelvic examination

- note any tenderness or warmth in the vagina
- feel the consistence of the cervix
- move the cervix and check for cervical motion tenderness
- feel the size and position of the uterus, check the mobility, note any tenderness
- feel the ovaries and tubes during examination of the lateral fornices
- note the presence of tenderness in the fornices.

Syphilis

Syphilis is a systemic disease caused by infection with the spirochete *Treponema pallidum subsp pallidum.* It is transmitted from one person to another during sexual intercourse, during pregnancy from mother to child or via infected blood and rarely through direct inoculation from an infectious lesion. The incubation period is 9 -90 days.

Syphilis is classified as acquired or congenital. These are further classified as follows:

Early acquired syphilis	-	Primary
		Secondary
		Early latent (< 2 years of infection)
Late acquired syphilis	-	Late latent (> 2years of infection)
		Gummatous
		Cardiovascular
		Neurological
Congenital syphilis	-	Early - diagnosed in the first two years of life
		Late - presenting after two years of life

Early syphilis

Clinical features

Primary syphilis

Primary syphilis is characterized by an ano-genital ulcer known as the 'chancre' which is typically single, painless and indurated with a clean base discharging clear serum. However, chancres may also present as multiple, painful, purulent, destructive lesions. Primary syphilis may present as syphilitic balanitis of Follman. Sometimes they may be found at extragenital sites. Non tender regional lymphadenopathy is common. Any anogenital ulcer should be considered to be syphilitic unless proven otherwise.

Secondary syphilis

Secondary syphilis is characterized by multisystem involvement within the first two years of infection. Common features are generalized polymorphic rash often affecting the palms and soles, generalized lymphadenopathy, condylomata lata and mucocutaneous lesions. Mucocutaneous lesions may relapse and regress during the first 2 years of infection. Patchy alopecia, anterior uveitis, meningitis, cranial nerve palsies, hepatitis, splenomegaly, periosteitis and glomerulonephritis are less common. The rash is classically non-itchy but may be itchy in some patients.

Early latent syphilis

Latent syphilis is characterized by positive serological tests for syphilis without any clinical features. Syphilis acquired within the preceding two years is referred to as early latent syphilis.

Diagnosis of early latent syphilis can be made in a patient who had one of the following criteria with in previous 24 months

1) A documented seroconversion or fourfold or greater increase in titer of a nontreponemal test

2) Unequivocal symptoms of primary or secondary syphilis

3) A sex partner documented to have primary, secondary or early latent syphilis

4) Reactive treponemal test from a person whose only possible exposure occurred within the previous 24 months.

Diagnosis

See lab diagnosis

Recommended treatment for early syphilis (primary, secondary and early latent)

Benzathine penicillin 2.4 MU single dose intramuscularly after sensitivity test (ST)

Penicillin Allergy

Doxycycline 100mg twice daily for 14 days
Erythromycin 500mg qds for 14 days (used when doxycycline is contraindicated)

In pregnancy

Benzathine penicillin single dose is the treatment (as above) during first and second trimesters. However, when maternal treatment is initiated in the third trimester, a second dose of benzathine penicillin is to be given 1 week after the first.

- Neurological/ophthalmic involvement in early syphilis should be treated as for neurosyphilis (see neurosyphilis)
- HIV positive individuals should be treated as same as HIV negative individuals. However, higher rate of treatment failure has been noted.

Follow-Up

- There is very little evidence to advice regarding the duration of sexual abstinence required following treatment. However, patients should be advised to refrain from sexual contact of any kind until the lesions of early syphilis (if they were present) are fully healed or until after the results of the first follow up serology are known.
- For early syphilis, minimum clinical and serological (VDRL) follow-up should be at months 1, 2, 3, 6 and 12, then 6 monthly until VDRL negative or serofast (usually for 2yrs).
- A sustained fourfold or greater increase in the VDRL titre suggests re-infection or treatment failure.
- Specific treponemal tests may remain positive for life following effective treatment. Therefore, proper documentation in the clinic records as well as providing the patient with a document confirming the treatment given are required to prevent unnecessary retreatment.
- Those with concomitant HIV infection should be followed up annually for life.

Management of sexual partners

Patients with early syphilis are infectious. Therefore, contacts of early syphilis should be treated epidemiologically irrespective of their serologic results. For patients with primary syphilis, sexual partners within the past three months should be notified as the incubation period is up to 90 days. Partner notification may have to extend to 2 years for patients in secondary syphilis with clinical relapse or in early latent syphilis. For purposes of partner notification and epidemiological treatment of exposed sex partners, patients with syphilis of unknown duration who have high nontreponemal serologic test titers (i.e., >1:32) can be assumed to have early syphilis.

Recommended regimen for epidemiological treatment

Benzathine penicillin 2.4 MU single dose intramuscularly after ST.

Penicillin allergy

Doxycycline 100mg twice daily for 14 days
Erythromycin 500mg qds for 14 days (used when doxycycline is contraindicated)

Reactions to treatment

Allergic reaction to penicillin

Patients should be warned of possible reactions to treatment. Facilities for resuscitation and treatment of anaphylaxis should be available in the treatment area. All patients should be kept on clinic premises for at least15 minutes after receiving their first injection to observe for immediate adverse reactions. In addition, patients should be advised to seek urgent medical attention if they experience shortness of breath, itchy wheals on their skin, facial swelling or tightness in their chest or throat.

Jarisch Herxheimer reaction

Jarisch Herxheimer reaction is an acute febrile illness with headache, myalgia, chills and rigors which resolves within 24 hours. This is common in early syphilis but is usually not important unless there is neurological or ophthalmic involvement or in pregnancy where it may cause fetal distress and premature labour. It is uncommon in late syphilis but can potentially be life threatening if there is involvement of strategic sites (eg coronary ostia, larynx, and nervous system). Prednisolone can reduce the febrile episode but is not proven to ameliorate local inflammation. Severe clinical deterioration in early syphilis with optic neuritis and uveitis has been reported following treatment. In patients with cardiovascular or neurological involvement including optic neuritis, inpatient management is advisable. Management should include antipyretics and reassurance. Steroids are recommended when there is neurological or cardiovascular involvement and some physicians recommend this treatment in pregnancy when additional fetal monitoring is required. Prednisolone 40 - 60mg daily for 3 days can be used. Anti treponemal treatment has to be started 24 hours after commencing prednisolone.

Late syphilis

Late latent syphilis and latent syphilis of unknown duration

Latent syphilis is defined as syphilis characterized by seroreactivity without other evidence of disease. Syphilis acquired more than two years ago is referred to as late latent syphilis.
Patients with latent syphilis need complete clinical examination to exclude other stages of syphilis. It is difficult to distinguish late latent syphilis from early latent syphilis (for more details see early latent syphilis). Nontreponemal

serologic titers are usually higher during early latent syphilis than late latent syphilis. However, early latent syphilis cannot be reliably distinguished from late latent syphilis solely on the basis of nontreponemal titers.

Recommended treatment

Benzathine penicillin 2.4 MU intramuscularly after ST weekly for 3 weeks
If a patient misses a dose of penicillin in a course of weekly therapy of benzathine penicillin; an interval of 10–14 days between doses might be acceptable before restarting the sequence of injections. However, missed doses are not acceptable for pregnant patients. Pregnant women who miss any dose must repeat the full course of therapy.

Penicillin Allergy.

Doxycycline 100 mg twice daily for 28 days
Erythromycin 500mg qds for 28 days (used when doxycycline is contraindicated)

Follow-Up.

VDRL testing should be repeated in 3, 6, 12, 18 and 24 months.

Gummatous and cardiovascular syphilis

Gummatous syphilis

Gummata usually occur 10-15 years after infection. They are inflammatory granulomatous destructive lesions which can occur in any organ but most commonly affect bone and skin.
Diagnosis of syphilitic gummata is usually made on clinical grounds~ typical nodules/plaques or destructive lesions in individuals with positive syphilis serology. X rays and ultra sound scan (USS) may be helpful in detecting lesions in bone and internal organs. Histological examination of a lesion may suggest this diagnosis and *T.pallidum* may be identified within the nodules by PCR.

Cardiovascular Syphilis

Syphilis of cardiovascular system clinically manifest after a latent period of 15-30 yrs. Cardiovascular syphilis may lead to aortitis, aortic aneurysm, aortic regurgitation, coronary artery stenosis and myocarditis. Clinical features depend on underlying condition.
The diagnosis is made by the presence of the clinical features of cardiovascular syphilis combined with positive syphilis serology. In addition ECG, chest X-ray and 2D echo cardiogram are helpful.
All patients with cardiovascular and gummatous syphilis must undergo CSF examination to exclude neurosyphilis.

Recommended treatment for cardiovascular and gummatous syphilis

Benzathine penicillin 2.4 MU intramuscularly, weekly for 3 weeks

Penicillin Allergy

Doxycycline 100 mg twice daily for 28 days

- Gummata affecting vital organs should be managed in collaboration with the appropriate specialist.
- Cardiovascular lesions may progress despite adequate treatment for syphilis. Steroid therapy is

recommended in cardiovascular syphilis to prevent potential consequences of Jarisch Herxheimer reaction. All patients with suspected cardiovascular syphilis should be reviewed by a cardiologist.

Neurosyphilis

CNS involvement can occur during any stage of syphilis. There are several types of neurosyphilis including asymptomatic neurosyphilis, acute meningitis, meningovascular syphilis, general paresis, tabes dorsalis and ocular manifestations. Clinical features differ according to the type. All patients with suspected neurosyphilis should be reviewed by a neurologist

Diagnosis

CSF examination is the most useful diagnostic investigation of neurosyphilis. In order to interpret accurately, it is vital that the CSF should not be macroscopically contaminated with blood.
CSF changes in neurosyphilis:

- Raised lymphocyte count (>5 cells/mm^3).
- Raised proteins (> 40 mg / dl)
- Positive VDRL test is almost diagnostic of neurosyphilis. However, a negative test will not exclude it.
- A negative treponemal test excludes neurosyphilis but a positive test does not confirm the diagnosis. Neurosyphilis is unlikely when the CSF, TPPA titre is less than 640.

Indications for CSF examination:

- neurologic or ophthalmic signs or symptoms,
- evidence of active tertiary syphilis (e.g. cardiovascular syphilis and gumma)
- treatment failure

Patients should have a thorough neurological examination to rule out focal neurological signs or papilloedema that may indicate raised intracranial pressure and a CT head requested if these signs are present prior to lumbar puncture.Once the neurosyphilis is diagnosed, necessary investigations should be performed to rule-out possible cardiovascular syphilis.

Recommended treatment

Aqueous crystalline penicillin 4 million units IV every 4 hourly for 14 days.

Penicillin Allergy

Doxycycline 200 mg twice daily for 28 days

Follow-Up.

If CSF pleocytosis was present initially, a CSF examination should be repeated every 6 months until the cell count is normal. Follow-up CSF examinations also can be used to evaluate changes in the VDRL or protein after therapy; however, changes in these two parameters occur more slowly than cell counts, and persistent abnormalities might be less important.
CSF abnormalities of HIV infected persons (with neurosyphilis) might persist for extended period and close clinical follow-up is warranted

Partner management in late syphilis

Patients with late syphilis are noninfectious. Partners should be screened for syphilis and offer treatment if they have the disease.

Congenital syphilis

At birth 50% of babies with congenital syphilis may be asymptomatic. Symptoms appear in the first month, but may be delayed until the second year of life..

Symptoms

swelling of joints, blistering skin rash, nasal discharge
bone changes, pseudoparesis, bleeding, fever, hepato-splenomegaly,
low-birth weight, , oedema, abdominal distention, pallor, respiratory distress

Diagnosis of congenital syphilis

Dark field microscopy
By demonstrating the presence of *T. Pallidum* in the dark field microscopy in a specimen taken from suspicious lesions or body fluids (Eg. nasal discharge)

Serology

1. Non treponemal serologic titer (VDRL) four fold higher than that of the mother at the time of delivery
2. Presence of IgM antibodies in the infant
3. Rising non-treponemal antibodies in the infant

Treatment

- If the baby presents within first seven days of delivery, treat with Aqueous crystalline penicillin 50,000 units / kg intra-venous, 12 hourly for 7 days and then 50,000 units / kg IV, 8 (eight) hourly for 3 days (altogether for 10 days)
- If the baby presents between 8-30 days of delivery treat with Aqueous crystalline penicillin 50,000 units / kg IV, 8 (eight) hourly for 10 days
- If the baby presents more than one month after delivery, treat with Aqueous crystalline penicillin 50,000 units / kg IV, 4-6 (four –six) hourly for 10 days

This treatment should be given to

- all symptomatic babies
- asymptomatic babies
- with serologic evidence
- whose mother was treated < 4 weeks prior to delivery
- whose mother was not treated
- whose mother's treatment was not completed during the pregnancy

Asymptomatic babies born to mothers who received adequate treatment for syphilis 4 weeks prior to delivery with no serologic evidence, should be treated with a single dose of Benzathine penicillin 50,000 units / kg intra muscularly.

Genital Herpes

Introduction
Genital herpes is a chronic life long viral infection. Infection may be primary or non-primary. Disease episodes may be initial or recurrent and symptomatic or asymptomatic.

Initial episode: First episode with either HSV-1 or HSV-2. Depending on whether the individual has had prior exposure to the other type, this is further subdivided into primary infection and non-primary infection.

Primary infection: First infection with either HSV-1 or HSV-2 in an individual with no pre-existing antibodies to either type.

Non-primary infection: First infection with either HSV-1 or HSV-2 in an individual with pre- existing antibodies to the other type.

Recurrent episode: Recurrence of clinical symptoms due to reactivation of pre-existent HSV-1 or HSV-2 infection after a period of latency.
It is likely that the majority of infections are acquired sub-clinically as at least 80% of persons seropositive for HSV type-specific antibodies are unaware of that they have been infected.
Following primary infection, the virus becomes latent in local sensory ganglia, periodically reactivating to cause symptomatic lesions or asymptomatic, but infectious, viral shedding.

Aetiology

- Herpes simplex virus type 1 (HSV-1, the usual cause of oro-labial herpes)

  or

- Herpes simplex virus type 2 (HSV-2, usually associated with sexual transmission)
  The majority of individuals found to be seropositive for HSV-2 type-specific antibodies subsequently develop symptomatic lesions

Clinical Features

Symptoms

- The patient may be asymptomatic and the disease may be unrecognized.
- Local symptoms consist of painful ulceration, dysuria, vaginal or urethral discharge.
- Systemic symptoms are much more common in primary than in initial or recurrent disease.
- Systemic symptoms consist of fever and myalgia.

Signs

- Blistering and ulceration of the external genitalia (+/- cervix/rectum)
- Tender inguinal lymphadenitis, usually bilateral.
- In first episodes, lesions and lymphadenitis are usually bilateral. In recurrent disease, it is usual for lesions to affect favoured sites.

Complications

- Autonomic neuropathy, resulting in urinary retention.
- Autoinoculation to fingers and adjacent skin e.g. on thighs
- Keratitis
- Aseptic meningitis

Atypical Genital Herpes

- The lesions of recurrent episodes may be small, and may resemble non-specific erythema, erosions or fissures.

Diagnosis

- Clinical history and appearance often typical but always attempt to confirm diagnosis by viral culture
- Culture becomes less sensitive as lesions age. Therefore, a negative culture does not exclude the diagnosis

Definitive

- Isolation of HSV in cell culture from the cervix, urethra, or genital or perianal lesions

Presumptive

- Positive antigen detection test (HSV ELISA)

  or
- Clinical features suggestive of HSV and presence of multinuclear giant cells in a scraping from lesions stained with Giemsa stain

Serology may be helpful in the following situations

- o Recurrent genital disease of unknown cause
- o Counselling patients with initial episodes of disease, including pregnant women
- o Investigating asymptomatic partners of patients with genital herpes, including pregnant women

Management

First Episode Genital Herpes

General advice

- Saline wash - two to four times a day
- Analgesics
- Keep the area clean and dry

Antiviral drugs

- Oral antiviral drugs are indicated as early as possible of the start of the episode and while new lesions are still forming.
- Topical agents are less effective than oral agents.
- Intravenous therapy is indicated only when the patient cannot swallow or tolerate oral medication because of vomiting.

Recommended regimens (usually for 5-7 days)

- Aciclovir 200 mg five times daily
- Aciclovir 400 mg three times daily
- Valaciclovir 500 mg twice daily.
- Famciclovir 250 mg three times daily

If super added secondary bacterial infection is present treat with appropriate antibiotics - preferably non-treponemocidal, like cotrimoxazole or ciprofloxacin. If fungal infection is suspected treat with an antifungal-fluconazole (avoid topical antifungals).

Management of complications

- Hospitalization may be required for urinary retention, meningitis, and severe constitutional symptoms.
- If catheterisation is required, suprapubic catheterisation is preferred to prevent theoretical risk of ascending infection, to reduce the pain associated with the procedure, to allow normal micturition to be restored without multiple removals and recatheterisations. ?

Follow up

Usually patients are reviewed after 5-7 days. If severe lesions are present it is advisable to review on the third day. In females look for evidence of labial adhesions.

Recurrent Genital Herpes

Recurrences are self-limiting and generally cause minor symptoms. Management includes:

- Episodic antiviral treatment
  or
- Suppressive therapy
- suppressive antiviral therapy.

Episodic antiviral treatment (should ideally be started during prodromes)
Recommended regimens (all for five days)

- Aciclovir 200 mg five times daily
- Aciclovir 400 mg three times daily
- Valaciclovir 500 mg twice daily
- Famciclovir 125 mg twice daily

• Short course therapies

- Aciclovir 800mg three times daily for 2days
- Valaciclovir 500 mg bd for 3 days

Suppressive antiviral therapy

For patients who have had six or more recurrences per year suppressive therapy may be considered.
Recommended regimens

- Aciclovir 400mg twice daily
- Aciclovir 200mg four times daily
- Famciclovir 250mg twice daily
- Valaciclovir 500mg once daily

If breakthrough recurrences occur on standard treatment, the daily dosage should be increased eg. aciclovir 400mg three times daily.

- Suppressive therapy should be discontinued after a maximum of a year to reassess recurrence frequency. The minimum period of assessment should include two recurrences. Patients who continue to have unacceptably high rates of recurrences may restart treatment.
- Short courses of suppressive therapy may be helpful for some patients.

Counselling

Diagnosis often causes considerable distress.
Counselling should cover:

- Natural history.
- The use of antiviral drugs for symptom control.
- Discussion of the risks of transmission by sexual contact.
- Abstinence from sexual contact during lesional recurrences or prodromes.
- Transmission may occur as a result of asymptomatic viral shedding.
- Seropositive patients with unrecognized recurrences can be taught to recognize symptomatic episodes after counselling and this may prevent onward transmission.
- The possible benefit of condoms in reducing transmission, emphasizing that their use cannot completely prevent transmission.
- Pregnancy issues for both men and women (see below)

Partner management

- Sex partners of patients who have genital herpes can benefit from evaluation and counselling
- Symptomatic partners should be evaluated and treated
- Asymptomatic partners should be questioned regarding genital lesions and offered type-specific serology if available

Management of herpes in pregnancy

GH in pregnancy should be managed according to clinical stage; first episode or recurrent episode. Accurate clinical classification between first and recurrent episodes may be difficult. Therefore, viral isolation and testing of paired sera may be helpful. Management of women with suspected genital herpes should always be carried out in consultation with a Venereologist.

First Episode genital herpes

<u>First and second trimester acquisition</u>

- First episode genital herpes has been associated with first trimester miscarriage. However, there is no conclusive evidence that it causes developmental abnormality if the pregnancy continues.
- Management should be in line with the clinical condition with the use of either oral or intravenous aciclovir.
- Although aciclovir is not licensed for use in pregnancy, there is substantial clinical experience supporting its safety.
- Daily suppressive therapy with aciclovir 400 mg tid from 36 weeks gestation may be considered for women who experience frequent recurrences of genital herpes in order to reduce the likelihood of HSV lesions at term.
- Vaginal delivery should be anticipated. However, if lesions are present at the onset of labour, delivery by CS is recommended.

<u>Third trimester acquisition</u>

- Caesarean section should be offered to all women presenting with first-episode genital herpes lesions during the third trimester, at onset of labour or at the time of delivery. However, Caesarean section may not be of benefit in reducing transmission for women presenting with ruptured membranes for greater than four hours. In all these cases the paediatricians should be informed .
- Continuous aciclovir in the last 4 weeks of pregnancy reduces the risk of clinical recurrence at term.

- If vaginal delivery is unavoidable or where the mother opts for a vaginal birth, prolonged rupture of membranes should be avoided and invasive procedures should not be used. IV aciclovir given intraparum to the mother and subsequently to the neonate may be considered. The paediatricians should be informed.

Recurrent Genital Herpes

- Antiviral treatment may be indicated if genital lesions are severe.
- Symptomatic recurrences during the third trimester are likely to be brief and vaginal delivery is appropriate if no lesions are present at delivery.
- Caesarean section should be considered for women with recurrent genital herpes lesions at the onset of labour. Recurrent genital herpes at any other time during pregnancy is not an indication for delivery by CS.
- For women with a history of recurrent genital herpes, daily suppressive aciclovir given from 36 weeks gestation until delivery may reduce the likelihood of HSV lesions at term.

Prevention of Acquisition of Infection

- Women who report a history of genital herpes can be reassured that the risk of transmission to the neonate is very small, even if genital lesions are present at delivery.
- Recurrences during pregnancy pose no threat to the pregnancy or well-being of the foetus.
- Female partners of men with genital herpes, who themselves give no history of genital herpes, should be advised about reducing their risk of acquiring this infection. Women may reduce their risk of acquiring herpes during pregnancy and of subsequent transmission to the neonate by using condoms consistently, especially the third trimester, and abstaining from sexual intercourse during recurrences. Women should avoid receptive oro-genital contact if their partner has oro-labial herpes.
- Neonatal herpes may occur as a result of nosocomial or community-acquired infection. Mothers, staff, and other relatives/friends with active HSV infection, such as orolabial herpes or herpetic whitlow, should avoid direct contact between lesions and the neonate.

Management of genital herpes in people with HIV

First episode genital herpes

- In the absence of HIV therapy, primary genital herpes may be severe and prolonged with risk of progressive, multifocal and coalescing mucocutaneous anogenital lesions. Moreover, serious and potentially life-threatening systemic complications, such as fulminant hepatitis, pneumonia, neurological disease and disseminated infection have been reported.
- Prompt initiation of therapy is recommended if herpes is suspected clinically. If new lesions are still forming after 3-5 days, consider increasing the dose of HSV therapy as susceptibility testing is not available.
- Recommended regimens
  - o Aciclovir 400 mg five times daily for 7-10 days.
  - o Valaciclovir 1g twice daily for 10 days
  - o Famciclovir 250-750 mg twice daily for 10 days
- In severe cases, initiation of therapy with aciclovir 5-10 mg/kg body weight IV every 8 hours may be necessary. Induction therapy should be continued intravenously for 2-7 days, or until clinical improvement, and followed by oral antiviral therapy to complete a minimum of 10 days total treatment.

Recurrent Genital Herpes

- Both clinical and subclinical reactivations of genital herpes are more frequent in HIV patients and may lead to persistent and progressive anogenital mucocutaneous lesions, especially with CD4 cell counts less than 50 per cubic millimeter. Optimizing the control of HIV replication with combination antiretroviral therapy is of fundamental importance for the management of recurrent genital herpes. HAART will reduce the frequency

of clinical recurrences but has less effect upon asymptomatic viral shedding. Thereafter, specific antiviral drugs can be used for either episodic or suppressive treatment.

Episodic Treatment

The following drug regimens are recommended for episodic treatment

- Aciclovir 400 mg three times daily for 5-10 days
- Famciclovir 500 mg twice daily for 5-10 days
- Valaciclovir 1g twice daily for 5-10 days

Suppressive Treatment

The efficacy of suppressive antiviral therapy in HIV patients appears to be less than in HIV-negative people. Recommended drug regimens for daily suppressive treatment

- Aciclovir 400-800 mg twice to three times a day
- Famciclovir 500 mg twice a day
- Valaciclovir 500 mg twice a day

Drug resistant genital herpes

In prospective studies, aciclovir-resistant strains have been found in around 5-7% isolates from genital herpes lesions in HIV-infected persons. In such instances, opinion should be sought from consultant Venereologists.

Auditable outcome measures

- Virological confirmation should be attempted in all new patients. Target 100% where facilities are available
- Patients presenting early in the course of first episode GH should be offered antiviral therapy. Target 100%.
- Patients with a diagnosis of GH should be offered counseling and support. Target 100%.

Gonorrhoea

Aetiology.

Infection with the gram-negative intracellular diplococcus *Neisseria gonorrhoeae leads to* Gonorrhoea. The primary sites of infection are the mucous membranes of the urethra, endocervix, rectum, pharynx and conjunctiva. Transmission is by direct inoculation of secretions containing organisms, from one mucous membrane to another.

Clinical features.

Symptoms.

Men :

Urethral infection	-	urethral discharge (80%) and/or dysuria (50%). can be asymptomatic (<10%).
Rectal infection	-	usually asymptomatic, anal discharge (12%) or perianal/anal pain or discomfort (7%).
Pharyngeal infection	-	usually asymptomatic (>90%), may present as mild sore throat.

Women:

Frequently asymptomatic .

Endocervical infection	-	increased or altered vaginal discharge (up to 50%). lower abdominal pain (up to 25%). intermenstrual bleeding or menorrhagia rarely.
Urethral infection	-	dysuria (12%) but not frequency.
Pharyngeal infection	-	asymptomatic (>90%)
Rectal infection	-	frequently asymptomatic.

Neisseria gonorrhoeae may co-exist with other genital mucosal pathogens, notably *Chlamydia trachomatis, Trichomonas vaginalis and Candida albicans and there may be* symptoms attributable to co-infecting pathogen/s.

Signs of uncomplicated gonococcal infection.

Men:

- a mucopurulent or purulent urethral discharge is commonly evident.

Women:

- commonly, no abnormal findings are present on examination.
- mucopurulent endocervical discharge and easily induced endocervical bleeding (<50%).
- pelvic/lower abdominal tenderness (<5%).

Complications.

Local complications.

Male

- Transluminal spread of *N. gonorrhoeae* may occur from the urethra to involve the epididymis, urethral glands, Tyson gland, and prostate in men (1% or less).

- Tysonitis – Infection of the Tyson's gland situated on both sides of frenum
- Littritis – Infection of the Littre's gland is a common complication of anterior urethritis. Littre's gland surrounds the urethra into in to which they open.
- Cowperitis – infection of the cowpers glands which are situated in the perineum and open in to the posterior urethra
- Some patients may present with Penile cellulitis.

Female

Spread of *N. gonorrhoeae* may occur from the endocervix to the endometrium and pelvic organs in women (probably <10%) leading to Pelvic Inflammatory Disease. Infection of the Bartholin glands may cause Bartholin abscess.

Infection of the Bartholin's glands

- Pain or swelling in the lower part of the labia majora filling the posterior one third of the groove between the labia majora and minora
- Tenderness in the lower part of labia
- If the condition progress to abscess formation redness of the overlying skin, acute tenderness, swelling becomes fluctuant

Haematogenous dissemination

Haematogenous dissemination leading to Disseminated gonococcal infection (<1%) may occur from infected mucous membranes, resulting in skin lesions, arthralgia, arthritis and tenosynovitis.

Diagnosis.

The definitive diagnosis is established by the identification of *N. gonorrhoeae* at an infected site.

Collection of Specimens

Appropriate sites for specimen collection depend on the sex, age and sexual practices of the individual as well as the clinical manifestations of the infection.

Women: The primary collection site in women is the endocervical canal. The secondary sites include the urethra, rectum and oropharynx.

heterosexual men: In heterosexual men, material should be collected from the urethra.
homosexual men: The primary sites in homosexual men are the urethra, rectum and oropharynx.

Sterile cotton swabs can be used for specimen collection.

Endocervix – The use of antiseptics, analgesics and lubricants when collecting specimens should be avoided. Use a vaginal speculum, which may be moistened with warm water. After inserting the speculum, clean the exocervix with a cotton swab. Insert a swab 2cm into the cervical canal. Rotate and move the swab gently from side to side for 5-10 seconds to allow absorption of the exudates.

Urethra – Take urethral specimens at least one hour after the patient has passed urine. If discharge is evident collect pus directly on a swab. If not, milk the urethra to evacuate exudates. Still if no discharge is obtained, insert a thin swab 2-3cm in to the urethra and gently rotate the swab for 5-10 seconds. In women, massage the urethra against the pubic symphysis and use the same technique as for men.

Rectum – Insert a cotton swab 3cm into the anal canal and rotate it for 10 seconds to collect exudates from the crypts just inside the anal ring. If faecal contamination occurs, discard the swab and use another to obtain the specimen.

Vagina – Viginal specimens are recommended for women who have had a hysterectomy and for prepubertal girls.
For women who have had a hysterectomy - use a speculum and swab the posterior fornix for a few seconds.

For prepubertal girls- gonococcal vulvovginitis may occur in girls prior to puberty. Discharge can be collected with a swab without the use of a speculum.

Oropharynx – Swab the region of the tonsillar crypts and the posterior pharynx.

Transport of Specimens

Before inoculating on to the culture medium, a smear for microscopy should be made. To obtain a thin homogenous film, role the swab on to a clean slide, and allow the smear to air dry.

The highest yield of gonococci is obtained when specimens are inoculated directly on to a culture medium in the consultation room. Roll the swab containing the specimen over approximately ¼ of the surface of the plate. When rolling the swab, care should be taken not to dig into the medium. Inoculated plate should be sent to the laboratory immediately for further streaking and incubation.

If this is not practicable, the swabs should be inserted into a transport medium (Amies) and transported at room temperature, to reach the laboratory within 24-48 hours.

Microscopy

Sensitivity and specificity of a gram stained smear are 95% and 97%, respectively, of urethral discharge from a symptomatic male. Therefore a gram stain of a male urethral specimen that shows polymorphonuclear lymphocytes with intracellular gram negative diplococci can be considered diagnostic in ***symptomatic men***.
In females, however, smears of cervical secretions detect only 40-60% of culture positive specimens.
In asymptomatic patients of both sexes, the sensitivity of gram stain smear is extremely low and it should therefore not be considered as a diagnostic test.
Direct microscopic examination is not recommended for rectal and pharyngeal infections.

Culture

Culture offers a reliable, sensitive (>95%) and relatively cheap diagnostic test that also allows antimicrobial sensitivity testing. Selective culture media such as Thayer Martin (TM), modified Thayer Martin (MTM) and New York City (NYC) containing antimicrobials are often used for routine isolation of gonococci. A presumptive identification of colonies can be made by a Gram stain and an oxidase test. It is necessary to confirm the identification with carbohydrate degradation tests. Culture is considered the gold standard for the diagnosis of infection with *N. gonorrhoeae* in genital as well as non genital sites.

Tests for Chlamydia infection need to be done if available, as co-infection with Chlamydia is common

Management.

General Advice

Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves, their partner(s) and children. This should be reinforced with clear and accurate preferably written information.
Patients should be advised to avoid unprotected sexual intercourse until they and their partner(s) have completed treatment.and follow-up.

Further Investigations

Screening for coincident sexually transmitted infections should routinely be performed.

Treatment

Indications for therapy:
- a positive microscopy
- a positive culture for *N. gonorrhoeae*,
- on epidemiological grounds, if a recent sexual partner has confirmed gonococcal infection or If the baby has ophthalmia neonatorum due to Neisseria gonorrhoeae.

For both males and females, on the first day of examination if gram stain smear is positive, a presumptive diagnosis of gonococcal infection is made and treatment for Gonnorhoea should be commenced.
A confirmatory diagnosis can be made only on a positive culture result. This is especially important in medico-legal cases.

Recommended treatments

uncomplicated anogenital infection in adults:
Cefuroxime axetil 1g orally single dose
or
Ceftriaxone 250mg IM as a single dose or
Cefixime 400mg orally as a single dose or
Spectinomycin 2g IM as a single dose

Pharyngeal infection

Recommend treatment

Ceftriaxone 250mg im as a single dose

Beta lactam Allergy

Spectinomycin 2g IM as a single dose

Clinical experience indicates oral cefuroxime axetil 1g is safe and effective for the treatment of uncomplicated uro-genital gonorrhea.

Ceftriaxone in a single injection of 250mg provides sustained , high bactericidal levels in the blood. Extensive clinical experience indicates that ceftriaxone is safe and effective for the treatment of uncomplicated gonorrhoea at all anatomic sites, curing 98.9% of uncomplicated urogenital and ano rectal infections.
Ceftriaxone is the drug of choice for rectal, pharyngeal and ophthalmic infections.

Cefixime has an antimicrobial spectrum similar to that of ceftriaxone. In published clinical trials, the 400 mg dose cured 97.4% of uncomplicated urogenital and anorectal gonococcal infections. The advantage of cefixime is that it can be administered orally.

Spectinomycin is useful for the treatment of patients who can not tolerate cephalosporins. It has been effective in 98.2% of an uncomplicated urogenital and anorectal gonococcal infections in published clinical trials.

N. gonorrhoeae has shown the capacity to develop reduced sensitivity and resistance to many classes of antimicrobials.
Antimicrobial therapy should take account of local patterns of antimicrobial sensitivity to N. *gonorrhoeae*. The chosen regimen should eliminate infection in at least 95% of those presenting in the local community.

Co-infection with *Chlamydia trachomatis*

Genital infection with *C. trachomatis* commonly accompanies genital gonococcal infection (up to 20% of men and 40% of women with gonorrhoea). Screening for *C. trachomatis* should routinely be performed on adults with gonorrhoea and treatment given to eradicate possible co-infection. Combining effective antimicrobial therapy against *C. trachomatis* with single dose therapy for gonococcal infection is appropriate.

Anti chlamydial treatment
As co-infection with chlamydia trachomatis occurs in about 15-35%, give treatment for chlamydial infection on the same day (for both males and females).

Azithromycin 1 g orally stat
or
Doxycyclin 100mg twice a day for 7 days
or
Tetracycline 500mg 6 hrly for 7 days

Alternative treatment
Erythromycin 500mg 6 hrly for 7 days

Management of complications of gonorrhoea

Seek advise from a consultant Venereologist

Management of local complications of males

Recommended therapy –

- Cefuroxime axetil 1 g stat followed by 500 mg twice a day for 5 days
  or
- Ceftriaxone 250 mg single dose IM stat (or for 3 days)

Management of Bartholin gland infection

- If increasing in size aspiration with a wide bore needle under local anesthesia may be considered.
- In recurring attacks marsupialization need to be considered.

Recommended therapy –

Ceftriaxone 250 mg im for 3 days
and
Doxycycline 100 mg twice a day for 7 days

As anaerobic bacteria and sometimes trichomonas vaignalis may cause bartholinitis-
Metronidazole 400 mg twice a day orally for 5 days may be added.

Disseminated gonococcal infection (DGI)

DGI results from gonococcal bactereamia. DGI presents with petechial or pustular acral skin lesions, asymmetrical arthralgia, tenosynovitis or septic arthritis. The infection is complicated occasionally by perihepatitis and rarely by endocarditis or meningitis. Some strains of *N.gonorrhoeae* that cause DGI may cause minimal genital inflammation.

Hospitalization is recommended for initial therapy. Patients should be examined for clinical evidence of endocarditis and meningitis. Patients treated for DGI should be treated presumptively for concurrent *C.trachomatis* infection, unless appropriate testing excludes this infection.

Recommended regimen for DGI
Ceftriaxone 1g IM or IV every 24 hours
To be continued for 24-48 hours after improvement is noted, at which time therapy may be swithched to cefixime 400mg orally twice daily to complete at least one week treatment.

Gonococcal meningitis and endocarditis
Recommended regimen
Ceftriaxone 1-2 g IV every 12 hours for 10-14 days for meningitis and at least 4 weeks for endocarditis

Pregnancy and Breastfeeding

Pregnant women should not be treated with tetracycline antimicrobials.

Recommended Regimes

Cefuroxime axetil 1g orally single dose
or
Ceftriaxone 250mg IM as single dose.
or
Cefixime 400mg oral as single dose.
or
Spectinomycin 2g IM as single dose

And antichlamydial therapy with
Erythromycin 500mg 6 hourly for 7 days
or
Erythromycin 500 mg twice a day for 14 days
Or
Azithromycin 1 g orally single dose

HIV infection

Management is same as in HIV negative.

Sexual partners

- Partner notification should be pursued in all patients identified with gonococcal infection. Action and outcomes should be documented.
- Male patients with symptomatic urethral infection should notify all partners with whom they had sexual contact within the preceding 2 weeks or their last partner if longer.
- Patients with infection at other sites or asymptomatic infection should notify all partners within the preceding 3 months.
- Sexual partners should be treated epidemiologically for gonorrhoea.

Follow up

Patients should be assessed after treatment

- To confirm compliance with treatment
- To ensure resolution of symptoms
- To enquire about adverse reactions
- To retake the sexual history to explore the possibility of re-infection
- To pursue partner notification and health promotion

Follow up

First Follow up

One week after commencement of initial therapy

1. Clinical examination – urethral smear for gram stain

2. Test of cure (TOC) – A test of cure culture is usually performed. Culture tests should be performed at least 72 hours after completion of antimicrobial therapy from all infected sites.

If the discharge is still present and direct smear is positive for neisseria gonorrhoea rule out reinfection. Check whether the partner has been investigated and treated epidemiologically.
Seek advise from a consultant.

<u>Auditable outcome measures</u>

At least 95% of cases of genital gonorrhoea should be cured by first line therapy.

All patients with gonorrhoea should be screened for genital infection with Chlamydia trachomatis or receive presumptive treatment for this infection.

All patients with gonorrhoea should have at least one documented interview in partner notification and their action documented.

All patients identified with gonorrhoea should receive information about sexually transmitted infections and their prevention.

For every case of gonorrhoea, at least 0.6 sexual partners should be verified as having been satisfactorily managed within 4 weeks.

Non-gonococcal urethritis (NGU)

Introduction

Urethritis or inflammation of the urethra, is a multifactorial condition which can be sexually acquired. It is characterised by discharge and/or dysuria but may be asymptomatic. Urethral inflammation can occur without a known pathogen being isolated in significant number of patients even using more sensitive detection methods

Aetiology

The prevalence of the common organisms associated with NGU is listed in following table.

Micro-organism	Prevalence
C. trachomatis	11-43%
M. genitalium	9-25%
Adenoviruses	2-4%
T. vaginalis	1-20%
Herpes simplex virus	2-3%

N. meningitidis, Haemophilus sp., Candida sp., urinary tract infections, urethral stricture and foreign bodies have been reported in a few cases and probably account for a small proportion of NGU. There is also a possible association of asymptomatic NGU with bacterial vaginosis.

It is known that some aetiological agents of sexually acquired NGU could potentially cause genital tract inflammation in women, in particular pelvic inflammatory disease (PID). This is undoubted with chlamydial and gonococcal infection and possible with *M. genitalium.*

Clinical features

Symptoms

- Urethral discharge
- Dysuria
- Urethral irritation

Some are asymptomatic.

Signs

- Urethral discharge.
  This may have not been noticed by the patient or may only be present on urethral massage.
- Erythema and oedema of urethral meatus (Meatitis)
- Normal examination

Complications

- Epididymo-orchitis
- Sexually acquired reactive arthritis / Reiter's syndrome
- Prostatitis

These are occurring in fewer than 1% of cases though incomplete forms may be more common.

Investigation and diagnosis

The diagnosis of urethritis must be confirmed by demonstrating polymorpho-nuclear leucocytes (PMNL) in the anterior urethra. This can be by means of:

(i) A Gram stained urethral smear containing 5 or more PMNL per high-power (x1000) microscopic field (averaged over five fields with greatest concentration of PMNL) and/or

(ii) A Gram stained preparation from a centrifuged sample of a first passed urine (FPU) specimen, containing 10 or more PMNL per high-power (x1000) microscopic field (averaged over five fields with greatest concentration of PMNL).

Either test can be used: both tests will identify cases missed by the other test.
The quality of the smear is heavily dependent on how the smear is taken. Either a 5 mm plastic, platinum loop or cotton-tipped swab can be used and should be introduced
about 1 cm into the urethra.

The sensitivity of the smear test is affected by the period since last passing urine. The optimum time to obtain a urethral smear is 2- 4 hours after last pass urine.

If urethritis is not detected in symptomatic patients, they should be advised to attend the clinic holding urine overnight to retest with urethral smear and/or urine(early morning sample - EMS).

A mid-stream sample of urine (MSU) should be taken if a urinary tract infection is suspected. Such as, for example, if the patient complains of severe dysuria, haematuria (microscopic or macroscopic), nocturia, urinary frequency, urgency, or has not been sexually exposed.

The traditional two-glass test adds little value to the diagnosis.

Management

<u>General advice</u>

The following should be discussed:

- An explanation of the causes of NGU, including non-infective causes, and possible short term and long term implications for the health of the patient and his partner.
- The side-effects of treatment and the importance of complying fully with it.
- The importance of their sex partner(s) being evaluated and treated
- Advice to abstain from sexual intercourse, or if that is not acceptable, the consistent use of condoms, until he has completed therapy and his partner(s) have been treated and next follow-up.
- Safer sex
- The importance of complying with any follow-up arrangements made.

<u>Further investigations</u>

Screen for other sexually transmitted infections.

Treatment

Treatment should be initiated as soon as the diagnosis is made and without waiting for the results of tests for chlamydia and cultures for *N. gonorrhoeae*.
It is important to note that the inflammatory exudate may persist for an unknown length of time even when the causative organism has been eliminated.

Recommended treatments

Doxycycline 100 mg twice a day for 7 days
or
Azithromycin 1g orally in a single dose

Alternative treatments

Erythromycin 500mg twice daily for 14 days
or
Ofloxacin 200mg twice a day or 400mg once a day for 7 days

Single dose therapy has the advantage of improved compliance although azithromycin has not been shown to be more effective in clinical studies than doxycycline.

HIV infection

Management is same as in HIV negative.

Sexual contacts/partners

All sexual partners at risk should be assessed and offered epidemiological treatment, maintaining patient confidentiality. The duration of "look back" is arbitrary ; 4 weeks is suggested for symptomatic men.

Follow-up for patients with NGU

Follow up is important in order to assess compliance with therapy and the response to therapy. Patients who have not completed their medication or who have had unprotected sexual intercourse with an untreated partner should be re-treated with appropriate partner notification and management.

Persistent/recurrent NGU

This is empirically defined as persistent or recurrent symptomatic urethritis occurring 30-90 days following treatment of acute NGU and occurs in 10-20% of patients. Its aetiology is probably multifactorial.

As there is no evidence that female partners of men with persistent/recurrent NGU are at increased risk of pelvic inflammatory disease, they do not need to be retreated, if they have been treated appropriately at first.

Diagnosis of persistent / recurrent NGU

Urethral smear and FPU specimen to be evaluated for polymorphs as for NGU. If patients are symptomatic with no objective evidence of NGU an early morning smear should be undertaken and if negative, reassure. Wet smear or urine deposit for TV may be helpful in arriving at a diagnosis.

Management of persistent/recurrent NGU

- Ensure that the patient has completed the initial course of therapy and that reinfection is not a possible cause.
- Only treat if patient has definite symptoms of urethritis, or physical signs on examination.

Recommended treatments

Erythromycin 500 mg four times daily for 3 weeks
or
Azithromycin 500mg stat then 250mgs daily for the next 4 days
plus
Metronidazole 400mg twice a day for five days

Continuing symptoms

There is only limited evidence on how best to manage patients who either remain symptomatic following a second course of treatment or who have frequent recurrences after treatment.

- If the patient has urinary flow problems refer to urologist.
- Chronic abacterial prostatitis and psychosexual causes should be considered in the differential diagnosis.
- For men with persistent or recurrent urethritis, currently there is no evidence that retreatment of an appropriately treated sexual partner is beneficial.

Auditable outcome measures

- Symptomatic men should be offered microscopy of a Gram-stained urethral smear or first void urine (100%).
- Men with NGU should be offered treatment with a recommended antibiotic regimen (100%).

Cervicitis

Aetiology

C. trachomatis and *N. gonorrhoeae* are the main organisms which cause cervicitis. Cervicitis also can accompany trichomoniasis and genital herpes (especially primary HSV-2 infection). However, in the majority of cases of cervicitis, no organism is isolated. Limited data indicate that infection with *M. genitalium,* candidiasis and bacterial vaginosis as well as frequent douching might cause cervicitis.

Clinical features

Cervicitis frequently is asymptomatic but symptoms include

- Abnormal vaginal discharge
- Intermenstrual vaginal bleeding
- Bleeding after sexual intercourse.

Major signs are

- Purulent or mucopurulent endocervical exudate
- Sustained endocervical bleeding (easily induced by gentle passage of a cotton swab through the cervical os**)**
- Cervical oedema and erythaema

Diagnosis

Women who seek medical treatment for a new episode of cervicitis should be tested for *C. trachomatis* and for *N. gonorrhoeae* with the most sensitive and specific test available. Women with cervicitis also should be evaluated for the presence of trichomoniasis, BV and candidiasis. These conditions should be treated apropriately, if present. Although HSV-2 infection has been associated with cervicitis, the utility of specific testing (i.e. culture) for HSV-2 in this setting is unclear. As cervical pus cells vary physiologically, there is no clear microscopic criterion to diagnose cervicitis. However, pus cells >30/ high power field in a cervical smear support the diagnosis of cervicitis.

Treatment

If sensitive tests to diagnose *C. trachomatis* are not available, treat with antibiotics effective for Chlamydia. Concomitant gonorrhea, trichomoniasis, candida or symptomatic BV should also be treated, if detected.

Recommended regimens

- Doxycycline 100 mg orally twice a day for 7 days
  or
- Azithromycin 1 g orally in a single dose

Recurrent and Persistent Cervicitis

Women with persistent cervicitis should be reevaluated for drug compliance and possible re-exposure. If relapse and/or re-infection with a specific STD have been excluded, BV is not present, and sex partners have been evaluated and treated, management options for persistent cervicitis are undefined. For such women, the

value of repeated or prolonged administration of antibiotic therapy for persistent symptomatic cervicitis is unknown.

Follow-Up

Follow-up should be conducted as recommended for the infections for which the patient is treated. If symptoms persist, patient should be instructed to return for reevaluation.

Management of Sex Partners

Management of sex partners of women treated for cervicitis should be appropriate for the identified or suspected STD. To avoid re-infection, patients and their sex partners should abstain from sexual intercourse until therapy is completed (i.e., 7 days after a single-dose regimen or after completion of a 7-day regimen).

HIV Infection

Patients who have cervicitis and also are infected with HIV should receive the same treatment regimen as those who are HIV negative. Treatment of cervicitis in HIV-infected women is vital because cervicitis increases cervical HIV shedding. Treatment of cervicitis in HIV infected women reduces HIV shedding from the cervix and might reduce HIV transmission to susceptible sex partners.

Genital Warts

Aetiology

Ano-genital warts are epithelial skin tumours caused by human papillomavirus (HPV). More than 100 genotypes of HPV have been identified. Most ano-genital warts are benign and caused by HPV types 6 and 11. Some lesions may contain oncogenic types (e.g., HPV 16, 18) associated with genital tract dysplasia and cancers. Ano-genital warts are the 'tip of the iceberg' of genital infection with HPV, as many more people without warts have subclinical disease or latent infection. The mode of transmission is most often by sexual contact but HPV may be transmitted perinatally.

Clinical features

Symptoms

Patients may present with flat, papular or pedunculated growths on the genital mucosa.
A large majority of patients with genital warts may experience little physical discomfort, but they may be disfiguring and psychologically distressing.
Ano-genital warts may be associated with irritation and soreness especially around the anus.
Symptoms such as bleeding from the urethra or anus, or distortion of urine flow may indicate internal lesions.

Sites

Warts are benign epithelial skin tumours:

- Lesions most commonly seen at the site of trauma at sexual intercourse, but may occur at any site.
- Perianal lesions - common in both sexes, but are seen more commonly in homosexual men.
- Warts in the anal canal are associated with penetrative anal sex, and may indicate the need for samples to be taken from the ano-rectal region for other STIs, e.g. *N. gonorrhoeae or C. trachomatis.*
- Occult lesions may be seen on the vagina, cervix, urethral meatus, and anal canal.
- Extragenital lesions may be seen on the oral cavity, larynx, conjunctivae, and nasal cavity.

Signs

- Warts may be single or multiple.
- Those on the warm, moist, non-hair bearing skin tend to be soft and non-keratinised and those on the dry hairy skin are firm and keratinised.
- Lesions may be broad based or pedunculated and some may be pigmented.

Diagnosis

- By visual inspection
- Biopsy is needed under certain circumstances
    - If the diagnosis is uncertain
    - Lesions do not respond to standard therapy
    - The disease worsens during therapy
    - The patient is immunocompromised
    - Warts are atypical, pigmented, indurated, fixed, bleeding or ulcerated

Assessment of lesions

- Examine the external ano-genital and surrounding skin under a good light
- Vaginal speculum examination should be carried out in females
- In both sexes, proctoscopy may be indicated if history of receptive anal sex, or following clearance of perianal warts. Meatoscopy and proctoscopy should be performed if there is a history of distortion of urine flow or bleeding from the urethra or anus respectively. Occasionally, urethroscopy is indicated for more proximal warts.
- Classify warts as to morphology
- Record lesions on genital maps at each visit indicating approximate number, distribution, and response to treatment
- Examine extragenital sites (e.g. oral cavity) if clinically indicated.

Differential diagnosis

- Condylomata lata of secondary syphilis
- Pearly penile papillae
- Fordyce syndrome
- Molluscum contagiosum
- Skin tags
- Malignancy

Management

General advice

- Patients should be given a detailed explanation of their condition with particular emphasis on the long term implications for the health of themselves and their partners. This should be reinforced by giving them clear and accurate written information where possible.
- Condoms have been shown to protect against the acquisition of HPV infection. Condom usage may prove beneficial and their use advisable, particularly in new relationships.
- Latex condoms may be weakened if in contact with imiquimod
- For most patients the psychological impact of warts is more distressing than the disease. Counselling is very important in the management of such patients.

Further investigations

Screening for other concurrent sexually transmitted infections (STI)

Cervical cytology is recommended for females.

Subclinical lesions

Subclinical lesions of the external ano-genital skin are those not seen by the naked eye, but detectable by soaking the skin with 5% acetic acid and examining with magnification (e.g. a colposcope). These lesions are usually asymptomatic, but may cause irritation and inflammation of the skin-for example, atypical balanoposthitis or vulvitis.

The application of 5% acetic acid usually turns HPV-infected genital mucosal tissue to a whitish colour. However, the specificity and sensitivity of this procedure has not been defined. Therefore, the routine use of acetic acid to detect HPV infection is not recommended (unless there is a clinical indication).

Treatment

The primary goal :
Treatment choice depends on the morphology, number, and distribution of warts and patient preference. Treatment decisions should be made after discussing the appropriate options with the patient, taking into account their preference and convenience.

- No definitive evidence suggests that any of the available treatments are superior to any other. No single treatment is ideal for all patients or all warts.
- All treatments have failure and relapse rates.
- Treatment may involve discomfort and local skin reactions.
- Soft non-keratinised warts respond well to podophyllin and trichloroacetic acid.
- Keratinised lesions are better treated with physical ablative methods such as cryotherapy, excision, or electrocautery
    - Local anaesthetic creams plus or minus injection with an injectable local anaesthetic (e.g. 2% lignocaine) could be used before ablative therapy to minimise discomfort. Avoid using adrenaline-containing anaesthetics for lesions on the penis and around the clitoris.

- Imiquimod may be suitable for both keratinised and non-keratinised warts.
    - Imiquimod for up to 16 weeks are suitable for home treatment by patients. If chosen, the patient should be given a demonstration on lesion finding and treatment application.
- An acceptable alternative for some patients is to forego treatment and wait for spontaneous resolution, particularly to warts in the vagina and anal canal.

<u>Treatments available</u>

Treatment regimens are classified into patient applied and provider applied modalities.

Patient applied methods

1. *Podophyllotoxin*

A purified extract of podophyllin in the form of a 0.5% solution for 4 week cycles or 0.15% cream for 5 week cycles is suitable for patient applied treatment. Supervision by medical staff is recommended when the lesion area treated is greater than 4 cm^2. Podophyllotoxin is not recommended for extragenital lesions such as anal warts and **should not be used in pregnancy.**

Treatment cycle consists of twice daily applications for 3 days, followed by 4 days rest for 4-5 cycles.

Discontinue treatment if significant side effects (e.g., soreness, ulceration)
Unprotected sexual contact should be avoided soon after application because of a possible irritant effect on the partner.

Podophyllotoxin is currently not available in STD clinics.

2. *Imiquimod*

Imiquimod is an immune response modifier.

- Available as a 5% cream, it induces a cytokine response when applied to skin infected with HPV
- Suitable for use on all external AGW but is not recommended for internal use
- Cream is applied to lesions three times weekly at bed time and treatment area should be washed with soap and water 6-10 hours later. Treatment can be continued for up to 16 weeks.
- Response to treatment may be delayed for some weeks.
- Unprotected sexual intercourse should be avoided soon after application because of a possible irritant effect on the partner.
- Latex condoms may be weakened if in contact with imiquimod.
- Imiquimod is **contraindicated in pregnancy**

Provider applied treatment

1. Podophyllin

Podophyllin is a non-standardised cytotoxic compound. It has been associated with severe local reactions. Serious systemic adverse events have occurred when used outside guidelines. Podophyllin is no longer recommended for internal lesions.

- 15-25% solution can be carefully applied to lesions, in clinic, once or twice weekly.

Caution:

- Podophyllin has caused serious systemic side effects if applied in excess. Increased systemic absorption is likely if used internally. Limit application to 10 cm^2 or 0.5 ml for external warts.
- Treatment area should be washed 4 hours later
- Podophyllin should be avoided on the vagina, cervix, in the anal canal, and for intrameatal warts.
- Podophyllin is **contraindicated in pregnancy**.

2. Trichloroacetic acid

Trichloroacetic acid (TCA) 80-90% solution is suitable for weekly application in a specialist clinic setting only. It acts as a caustic agent resulting in cellular necrosis.

- An intense burning sensation may be experienced for 5-10 minutes after application.
- Ulceration penetrating into the dermis may occur, and it is therefore not recommended for large volume warts.
- TCA can be used at most anatomical sites.
- Seek consultant opinion before using TCA for internal lesions

Caution

- TCA is extremely corrosive to the skin. Careful application and protection of the surrounding skin with petroleum jelly is recommended. A neutralising agent, for example sodium bicarbonate or talcum powder, should always be available in case of excess application or spills.

3. Interferons

Various regimens have been described using interferons alfa, beta, and gamma as creams and as intra-lesional or systemic injection. Interferons are currently not available for use in STD clinics in Sri Lanka

Interferons are not recommended for routine management of anogenital warts and should only be used on expert advice.

4. Physical ablation

a) Cryotherapy

Using a liquid nitrogen spray or a cryoprobe causes cytolysis at the dermal epidermal junction resulting in necrosis.

- Treatment should be applied until a "halo" of freezing has been established a few millimetres round the treated lesion.
- A freeze thaw technique should be used and lesions held frozen for 10-30 seconds depending upon size.
- There are health and safety issues to be considered when storing and handling liquid nitrogen.

b) Excision

Removal of warts under local anaesthetic injection is particularly useful for pedunculated warts, and small numbers of keratinised ones at anatomically accessible sites. The use of an anaesthetic cream prior to local anaesthetic injection is recommended.

Haemostasis can be established using electrosurgery, silver nitrate or application of a haemostatic solution.

Treatment can be repeated as required. This is a good method of treatment for small numbers of warts and may be underused

c) Electrosurgery

Patients need referral to a surgical unit. Three types are commonly used:

- Electrocautery
- Hyfrecator
- Monopolar surgery

d) Laser treatment

Patients need referral to a surgical unit. The carbon dioxide laser is especially suitable for large volume warts and can be used at difficult anatomical sites, such as the urethral meatus, or anal canal.

Caution:

All electrosurgical and laser techniques result in a plume of smoke which has been shown to contain HPV DNA, which may potentially cause infection of the respiratory tract in operating personnel. Therefore, masks should be worn and adequate air extraction provided during these procedures.

Management of sexual partners

Current sexual partner(s) may benefit from assessment as they may have undetected genital warts, undetected other STI, or need an explanation and advice about disease process in partner.
Female sexual partner(s) should be encouraged to undergo cervical cytology screening.

Tracing of previous sexual partner(s) is not recommended.

Follow up

- Review is recommended at end of course of treatment (about 6 weeks) to monitor response and assess need for changes in therapy. Patients whose original lesions have responded well to treatment but in whom new lesions are developing, can continue with current regimen.

- Change is indicated if patient is not tolerating current treatment, or less than 50% response to current treatment by six weeks (8-12 weeks for imiquimod).

- Relapses should be treated as appropriate to the lesion types.

Special considerations

Anatomical sites

• *Intravaginal*

Cryotherapy, electrosurgery and trichloroacetic acid are recommended treatments.

• *Cervix*

Cervical intraepithelial neoplasia (CIN) has been documented in patients with cervical warts. Colposcopy is not recommended in women with genital warts, including those with cervical lesions, unless there is diagnostic uncertainty or clinical concern. Discuss treatment of cervical warts with a consultant venereologist.

The following are appropriate treatment modalities for cervical warts:
- cryotherapy,
- electrosurgery,
- trichloroacetic acid (obtain consultant opinion)
- laser ablation
- excision.

• *Urethral meatus*

If base of lesions seen, treatment with cryotherapy, electrosurgery, laser ablation, podophyllotoxin or imiquimod under supervision. Lesions deeper in the urethra should be surgically ablated under direct vision, which require referral to a urologist.

- *Intra-anal*

Treatment options include trichloroacetic acid (with consultant opinion), cryotherapy, electrosurgery, and laser abalation.

- *Pregnancy*
  - Discuss management with a consultant venereologist
  - Avoid podophyllin and podophyllotoxin, because of possible teratogenic effects.
  - Imiquimod is not approved for use in pregnancy.
  - Treatment aims to minimise the number of lesions present at delivery to reduce the neonatal exposure to virus.
  - Potential problems for children are the development of laryngeal papillomatosis and ano-genital warts
  - Very rarely a caesarean section is indicated because of obstruction of the vaginal outlet with warts or the presence of gross cervical warts. Caesarean section is not indicated to prevent laryngeal papillomatosis/anogenital warts in the neonate as both conditions are rare.

<u>Cervical cytology</u>

All women with genital warts should undergo cervical cytology screening.

<u>Immunosuppressed</u>

- People with impaired cell mediated immunity, for example organ transplant patients or those with HIV infection, are likely to have poor treatment responses, increased relapse rates, and an increased risk of developing ano-genital intraepithelial neoplasia.
- Careful follow up is required in all these patients.

Trichomonas Vaginalis infection

Aetiology:

Trichomaniasis is a sexually transmitted infection caused by the protozoa, *Trichomonas vaginalis*. Some men who are infected might not have symptoms. Others have NGU. Many infected women have symptoms. However, some women have minimal or no symptoms.

Clinical Features

Symptoms:

Females:

- Vaginal discharge
- Vulval itching
- Dysuria
- Offensive odour

Some women are asymptomatic.

Males:

Men with *T. vaginalis* are often asymptomatic and usually present as sexual partners of infected women. When symptomatic the commonest presentation is with urethral discharge and/or dysuria. Other symptoms include urethral irritation and frequency.

Signs:

Females

- Vaginal discharge (varying in consistency from thin and scanty to profuse and thick)
- The classical discharge of frothy yellow occurs in 10-30% of women.
- Approximately 2% of patients will have strawberry cervix appearance to the naked eye.
  5-15% of women will have no abnormalities on examination.

Males

- Urethral discharge - usually small or moderate amounts only.
- Rarely balanoposthitis.
  There may be no signs, even in the presence of symptoms suggesting urethritis.

Complications:

T. vaginalis infection can have a detrimental outcome on pregnancy and is associated with preterm delivery and low birth weight. There is evidence that trichomonas infection may enhance HIV transmission.

Diagnosis:

Laboratory investigations:

Females

- Detection of Trichomonads in a wet mount of vaginal secretions collected from the posterior fornix.

Males

- Detection of Trichomonads in a urethral smear or centrifuged sediment of urine.

Management:

Treatment:

Metronidazole 2g orally in a single dose
or
Metronidazole 400mg twice daily for 5-7 days
The single dose has the advantage of improved compliance and being cheaper; however there is some evidence to suggest that the failure rate is higher, especially if partners are not treated concurrently.

Alternative regimens:

Tinidazole 2g orally in a single dose

Caution:

Patients should be advised not to take alcohol for the duration of treatment and for at least 48 hours afterwards because of the possibility of a disulfiram-like reaction.

Pregnancy and breast feeding:

Meta-analyses have concluded that there is no evidence of teratogenicity from the use of metronidazole in women during the first trimester of pregnancy. High doses (2g) should be avoided in pregnancy and lactation. Patients who fail to respond to first course of treatment often respond to a repeat course of standard treatment. If the patient does not respond to repeat course, seek advice from a consultant.

Management of sexual partners

Current partners should be screened for the full range of STIs and treated for TV irrespective of the results of investigations.

Auditable Outcome Measures

All patients found to have *T. vaginalis* infection should receive treatment with metronidazole, either as a single dose of 2g or 400mg twice daily for at least 5 days.
Contact tracing should be undertaken and all contacts attending should be treated *for T. vaginalis,* regardless of the results of their investigations.

Bacterial Vaginosis

Introduction

Bacterial vaginosis (BV) is the commonest cause of abnormal vaginal discharge in women of childbearing age. Whilst BV is not regarded as a sexually transmitted disease, the prevalence is generally higher amongst sexually active than non-sexually active women.

Aetiology

BV is characterised by an overgrowth of predominantly anaerobic organisms (*Gardnerella vaginalis*, Prevotella species, *Mycoplasma hominis*, Mobiluncus species) in the vagina, leading to replacement of lactobacilli. It has been found to be in association with the use of intrauterine contraceptive devices and the practice of douching.

Clinical features

Symptoms

Spontaneous onset and remission of BV can occur.
Offensive fishy smelling vaginal discharge
Usually not associated with soreness itching or irritation
Many women (approximately 50%) are asymptomatic

Signs

Thin, homogeneous discharge, coating the walls of the vagina and vestibule

Complications

In pregnancy BV is associated with late miscarriage, preterm premature rupture of membranes, preterm birth and postpartum endometritis. The prevalence of BV is high in women with pelvic inflammatory disease (PID). BV has been associated with an increased incidence of vaginal cuff cellulitis and abscess formation following trans-vaginal hysterectomy. In some instances BV may be associated with NGU in male partners.

Diagnosis

Amsel criteria.

At least three of the four criteria should be present for the diagnosis to be confirmed.

(1) Thin, homogeneous and adherent (to vaginal walls) discharge
(2) Clue cells on microscopy of virginal smear
(3) pH of vaginal fluid >4.5
(4) Release of a fishy odour on adding 10% KOH.

A Gram stained vaginal smear, evaluated with the Hay/Ison criteria

The Hay/Ison criteria are defined as follows:

grade 1 (Normal):	Lactobacillus morphotypes predominate
grade 2 (Intermediate):	Mixed flora with some Lactobacilli present, but Gardnerella or Mobiluncus morphotypes also present
grade 3 (BV):	Predominantly Gardnerella and/or Mobiluncus morphotypes. Few or absent Lactobacilli.

Management

General advice

Patients should be advised to avoid vaginal douching, use of shower gel, and use of antiseptic agents or shampoo in the bath.

Treatment

Treatment for BV is indicated for symptomatic women.
If a diagnosis of BV is made in asymptomatic women treatment may be offered.

Recommended treatments

Metronidazole 400 mg orally twice daily for 5-7 days
or
Metronidazole 2 g orally single dose

Alternative treatments

Intravaginal metronidazole gel (0.75%) once daily for 5 days
or
Intravaginal clindamycin cream (2%) once daily for 7 days
or
Clindamycin 300 mg orally twice daily for 7 days
or
Tinidazole 2 G orally single dose

Caution

- With metronidazole treatment alcohol should be avoided because of the possibility of a disulfiram-like action.
- Clindamycin cream can weaken condoms.

Pregnancy and breast feeding

- Meta-analyses have concluded that there is no evidence of teratogenicity from the use of metronidazole in women even during the first trimester of pregnancy. However it is advisable to avoid oral metranidazole during the first trimester.
- Metronidazole enters breast milk and may affect its taste. Small amounts of clindamycin enter breast milk. It is prudent therefore to use an intravaginal treatment for lactating women.
- It is preferable to avoid high (2G single) dose during pregnancy and breast feeding

Sexual partners

Routine screening and treatment of male partners are not indicated.

Follow up

A test of cure is not required.

Recurrent bacterial vaginosis

Metronidazole orally 400 mg bd for 3 days at the start and end of menstruation, combined with fluconazole 150 mg as a single dose if there is a history of candidiasis.

Auditable outcome measures
Diagnosis of BV in clinical practice as per Amsel's criteria.

Candidiasis

Aetiology

Candida albicans - 80-92%
Non-albicans species e.g. *C. glabrata*
Candidiasis is a common fungal infection usually caused by *C. albicans* but occasionally by other candida species. Genital candidiasis is a sexually transmissible disease. Among women candidiasis is presented as vulvovaginal candidiasis. Most women have had at least one symptomatic vaginal infection during their life time. Among men, it causes balanoposthitis.

Clinical features

Symptoms among women

- Vulval itching
- Vulval soreness
- Vaginal discharge
- Superficial dyspareunia
- External dysuria

Signs

- Erythema
- Fissuring
- Discharge (may be curd-like, non-offensive)
- Satellite lesions
- Oedema

Symptoms among men

- Local rash – may be scaly or ulcerated
- Soreness
- Itch
- Odour
- Inability to retract the foreskin
- Discharge from the glans/behind the foreskin

Signs

- Erythema/papules
- Scaling
- Ulceration
- Fissuring
- Crusting
- Exudate
- Oedema
- Odour
- Phimosis

NB: 10-20% women during reproductive years may harbour Candida species in absence of symptoms. These women do not require treatment.

Diagnosis

On many occasions diagnosis will be made on clinical grounds

Investigations

- Gram stain or wet mount with 10% KOH of vaginal discharge collected from lateral vaginal wall or anterior fornix looking for spores/pseudohyphae
- Culture, Sabouraud's media (This should be considered in all symptomatic cases where microscopy is inconclusive or in patients with recurrent candidiasis)

Management

General advice:

- Avoid local irritants e.g. perfumed products
- Avoid tight fitting synthetic clothing

Treatment

Topical Therapies (use one of the following)

- Clotrimazole* Pessary 500mg single dose at night
- Clotrimazole* Pessary 200mg x 3 nights
- Clotrimazole* Pessary 100mg x 6 nights
- Clotrimazole* Vaginal cream (10%) 5g stat
- Miconazole** Ovule 1.2g stat
- Miconazole** Pessary 100mg x 14 nights
- Nystatin Pessary (100,000 units) 1-2 x 14 nights

NB: * Effect on latex condoms and diaphragms not known
** Product damages latex condoms and diaphragms

Oral Therapies

- Fluconazole Capsule 150mg single dose
  or
- Itraconazole Capsule 200mg bd x 1day

NB: Avoid in pregnancy/risk of pregnancy and breast feeding

Pregnancy

Asymptomatic colonisation with *Candida* species is higher in pregnancy (30-40%). Symptomatic candidiasis is more prevalent throughout pregnancy. Treatment with topical azoles is recommended. Longer courses may be necessary. Oral therapy is contraindicated.

Sexual Partner(s)

There is no evidence to support treatment of asymptomatic male sexual partners.

Follow Up

Unnecessary if symptoms resolve. Test of cure is unnecessary.

Recurrent Candidiasis

Definition - Four or more episodes of symptomatic candidiasis annually.
Exclude diabetes mellitus. Other risk factors include underlying immunodeficiency, corticosteroid use, and frequent antibiotic use.

Treatment

Principles of therapy include induction (using one of the above mentioned regimens) followed by a maintenance regime for 6 months. Cessation of therapy may result in relapse.

Regimes for maintenance:

- Fluconazole 100mg weekly x 6 months
  or
- Clotrimazole pessary 500mg weekly x 6 months
  or
- Itraconazole 400mg monthly x 6 months
  or
- Ketoconazole 100mg daily x 6 months
  (Monitor LFTs monthly.)

Auditable Outcome Measures

Microscopy in all women with symptoms suggestive of vulvo-vaginal candidiasis. Target - 100%.

Ophthalmia Neonatorum

Conjunctival inflammation that occurs during the first 28 days of life.

Aetiology – Infective causes can be sexually transmitted agents such as N. gonorrhoeae and chalmydia trachomatis or other nonsexually transmitted agents.

Clinical features

Gonococcal ON	Chlamydial ON
Incubation period – 2-6 daysTypically bilateralPurulent dischargeOedema of eye lids Pseudomembranous and membranous reaction Conjunctival infection	5-12 days UnilateralMuco-purulent / sticky/ serous dischargeFollicular conjuctival reaction diffuse infection milder than GC

Dual infection with N. gonorrhoeae and Chlamydia can occur.

Complications

If not treated promptly GC ON may cause panophthalmitis, perforation of cornea, scarring, leading to blindness. Chlamydia ON can lead to impaired vision.

Diagnosis

Specimens should be obtained from the everted eyelid

- Gram stained smear and gonococcal culture from the conjuctival discharge
- Appropriate chlamydial testing should be done simultaneously. Specimens must contain conjunctival cells
- gonococcal Culture from nasopharynx and rectum

Other causes of neonatal ophthalmia include Moraxella catarrhalis and other Neisseria species that are indistinguishable from N. gonorrhoeae on Gram-stained smear but can be differentiated by culture. Therefore, a positive culture is essential for a definitive diagnosis of gonococcal infection.

Management

- Gonococcal ophthalmia is strongly suspected when intracellular gram-negative diplococci are identified in conjunctival exudate, justifying presumptive treatment for gonorrhea after appropriate cultures for *N. gonorrhoeae* are obtained.
- Presumptive treatment for *N. gonorrhoeae* might be indicated for newborns who are at increased risk for gonococcal ophthalmia and who have conjunctivitis but do not have gonococci in a Gram-stained smear of conjunctival exudate.

Infants who have gonococcal ophthalmia should be managed in consultation with the ophthalmologist.

Recommended treatment for gonococcal ophthalmia neonatorum

One dose of ceftriaxone is adequate therapy for gonococcal conjunctivitis. A chlamydial etiology should be considered for all infants aged <30 days who have conjunctivitis.

Ceftriaxone 50 mg/kg IM in a single dose, not to exceed 125 mg. Ceftriaxone
should be administered cautiously to hyperbilirubinemic infants, especially those born prematurely.
Topical antibiotic therapy is unnecessary.

Alternative regimens -
Spectinomycin 25 mg/kg IM as a single dose to a maximum of 75 mg.
Kanamycin 25 mg/kg IM as a single dose to a maximum of 75 mg.

Recommended treatment for chlamydial ophthalmia neonatorum
Erythromycin base or ethylsuccinate 50 mg/kg/day orally divided into 4 doses daily for 14 days.

Follow-Up

Follow-up of infants is recommended to determine whether initial treatment was effective.
TOC is necessary in gonococcal ON
The efficacy of erythromycin treatment is approximately 80%; a second course of therapy might be required.

If duration of ophthalmia is greater than 3 weeks, the possibility of concomitant chlamydial pneumonia should be considered.

Pelvic Inflammatory Disease

Introduction

PID is usually the result of infection ascending from the endocervix causing endometritis, salpingitis, parametritis, oophoritis, tuboovarian abscess and/or pelvic peritonitis. It may present as a single entity or a combination of the above conditions.

Aetiology

Neisseria gonorrhoeae and *Chlamydia trachomatis* have been identified as common causative agents, whilst *Gardnerella vaginalis*, anaerobes and other organisms associated with bacterial vaginosis may also be implicated. Mycoplasmas including *Mycoplasma genitalium* have also been associated with upper genital tract infection in women.

Clinical Features

PID may be symptomatic or asymptomatic. Even when present, clinical symptoms and signs lack sensitivity and specificity

Symptoms

- lower abdominal pain
- deep dyspareunia
- abnormal vaginal bleeding
- abnormal vaginal discharge

Signs

- lower abdominal tenderness which is usually bilateral
- adnexal tenderness
- cervical motion tenderness
- fever (>38°C)
- Mucopurulent cervical discharge

Diagnosis

- Endo-cervical swab for Gram staining, gonococcal culture and chlamydia testing
- Other general investigations [WBC/DC, ESR, CRP, UFR, urine for culture and ABST- if indicated]
- Laparoscopy (strongly support a diagnosis of PID but is not justified routinely)
- Endometrial biopsy and ultrasound scanning may also be helpful when there is diagnostic difficulty
- Screen for other STIs
- Pregnancy test (if indicated)

The diagnosis of PID is unlikely in the absence of endocervical or vaginal pus cells. However their presence may not always be indicative of PID.

It is important to exclude the following conditions, before arriving at a diagnosis of PID.

- Ectopic pregnancy – pregnancy should be excluded in all women suspected of having PID.
- Acute appendicitis
- Endometriosis

- Complications of an ovarian cyst – often of sudden onset
- Functional pain – may be associated with longstanding symptoms

Management

It is likely that delaying treatment increases the risk of long term sequelae such as ectopic pregnancy, infertility and pelvic pain. Because of this, and the lack of definitive diagnostic criteria, a low threshold for empiric treatment of PID is recommended.

A detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves and their partner(s) should be provided,

General Advice

- Rest is advised for those with severe disease.
- Patients should be advised to avoid unprotected intercourse until they, and their partner(s), have completed treatment and follow-up.

Outpatient therapy is as effective as inpatient treatment for patients with mild to moderate PID as assessed clinically.

Indications for hospitalization

- If a surgical emergency cannot be excluded
- Lack of response to oral therapy
- Clinically severe disease
- Presence of a tubo-ovarian abscess
- Intolerance to oral therapy
- Pregnancy
- When diagnosis is uncertain.

Treatment

Recommended Regimens

All the recommended regimens are of similar efficacy.

Outpatient Regimens

- Ceftriaxone 250mg IM single dose.
  followed by
  oral doxycycline 100mg twice daily plus metronidazole 400mg twice daily for 14 days

Inpatient Regimens

- i.v. cefoxitin 2g three times daily plus i.v. doxycycline 100mg twice daily (oral doxycycline may be used if tolerated)
  followed by

  oral doxycycline 100mg twice daily plus oral metronidazole 400mg twice daily for a total of 14 days
  Parenteral therapy may be discontinued 24hours after the patient improves clinically and oral therapy should be continued for a total of 14 days. Oral doxycycline is as effective as intravenous preparation.

Pregnancy and Breastfeeding

- In pregnancy PID is associated with an increase in both maternal and fetal morbidity, therefore parenteral therapy is advised
- IM ceftriaxone plus oral/IV erythromycin, with the possible addition of oral/IV metronidazole 500mg 3 times daily in clinically severe disease.

Sexual Partners

- Empirical treatment for gonorrhoea and chlamydia is recommended for all current male sexual contacts. Other recent sexual partners may also be offered screening - Tracing of contacts within a 6 month period of onset of symptoms is recommended but this time period may be influenced by the sexual history
- Partners should be advised to avoid intercourse until they and the index patient have completed the treatment course.

Follow Up

Review at 72 hours is recommended, if no substantial improvement in clinical symptoms and signs, refer for inward gynaecological management

Further review to ensure:

- adequate clinical response to treatment
- compliance with oral antibiotics

- appropriate investigations including TOC
  - screening and treatment of sexual contacts
  - awareness of the significance of PID and its sequelae

Complications

- Ectopic pregnancy
- Subfertility
- Septicaemia
- Fitz-Hugh-Curtis syndrome

<u>Important Notes:</u>

- Women with HIV may have more severe symptoms associated with PID but respond well to standard antibiotic therapy. No change in treatment recommendations compared to HIV uninfected patients is required. (TB and other opptunistic infections should be considerd)

- The Fitz-Hugh-Curtis syndrome comprises right upper quadrant pain associated with perihepatitis which occurs in up to 10-20% of women with PID.

Auditable Outcome Measures

Appropriate short term audit outcomes include:

- proportion of women receiving treatment with a recommended regimen – target 95%
- proportion of named male contacts screened for infection and/or treated – target 40% (large urban centres) or 60% (other centres)

Epididymo-orchitis

Aetiology:

In men younger than 35 years of age epididymo-orchitis is most often caused by sexually transmitted pathogens such as *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. In men older than 35 years of age epididymo-orchitis is most often caused by non-sexually transmitted Gram negative enteric organisms causing urinary tract infections. There is crossover between these groups and complete sexual history taking is imperative. Epididymo-orchitis caused by sexually transmitted enteric organisms also occurs in homosexual men who engage in insertive anal intercourse. Gram-negative enteric organisms are more commonly the cause of epididymo-orchitis if recent instrumentation or catheterisation has occurred. Anatomical abnormalities of the urinary tract are common in the group infected with Gram negative enteric organisms and further investigation of the urinary tract should be considered in all such patients but especially in those older than 50 years.

Clinical Features:

Symptoms

- Patients with epididymo-orchitis usually present with unilateral testicular pain
- In sexually transmitted epididymo-orchitis there may be symptoms of a urethritis or a urethral discharge; however the urethritis is often asymptomatic.

Signs

- Tenderness to palpation on the affected side
- Palpable swelling of the epididymis

There may also be:

- urethral discharge
- hydrocoele
- erythema and/or oedema of the scrotum on the affected side
- pyrexia

Torsion of the spermatic cord (testicular torsion) is the main differential diagnosis. It is a surgical emergency. It should be considered in all patients and should be excluded first as testicular salvage becomes decreasingly likely with time.

- Torsion is more likely if:

  the onset of pain is sudden
  the pain is severe
  tests performed during the initial visit show neither the presence of a urethritis nor probable urinary tract infection
- Torsion is more common in men who are younger than 20 years of age (the peak incidence is in adolescents), but can occur at any age.

Diagnosis:

The following should be performed:

- Urethral swab stained by Gram's method and examined microscopically for the diagnosis of urethritis, (≥5 polymorphonuclear leucocytes per high power field x1000)
- Urethral culture for *N gonorrhoeae*
- Antigen detection test for *C trachomatis* of a urethral swab. If available a nucleic acid test amplification test is preferable as it is much more sensitive.
- Microscopy and culture of mid-stream urine for bacteria.

If it can be arranged without delay, ultrasound scanning is useful to help differentiate between epididymoorchitis and torsion of the spermatic cord.

All patients with sexually transmitted epididymo-orchitis should be screened for other sexually transmitted infections.

Management:

General Advice

- Bed rest, scrotal elevation and support, and analgesics are recommended. Non-steroidal anti inflammatory drugs may be helpful.
- Patients should be advised to avoid unprotected sexual intercourse until they and their partner(s) have completed treatment and follow-up.
- Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves and their partner(s). This should be reinforced by giving them clear and accurate written information if available.

Treatment:

- Empirical therapy should be given to all patients with epididymo-orchitis before culture results are available.
  The antibiotic regimen chosen should be determined in light of the immediate tests as well as age, sexual history, any recent instrumentation or catheterisation and any known urinary tract abnormalities in the patient.
- Antibiotics used for sexually transmitted pathogens may need to be varied according to local knowledge of antibiotic sensitivities.

Recommended Regimens

For epididymo-orchitis most probably due to gonococcal infection:

- Ceftriaxone 250mg intramuscularly single dose
  plus
- Doxycycline 100mg by mouth twice daily for 10-14 days

For epididymo-orchitis most probably due to chlamydia infection or other non-gonococcal, non-enteric organisms:

- Doxycycline 100mg by mouth twice daily for 10-14 days

For epididymo-orchitis most probably due to enteric organisms:

- Ofloxacin 200mg by mouth twice daily for 14 days
  or
- Ciprofloxacin 500mg by mouth twice daily for 10 days

Follow-up

If there is no improvement in the patient's condition after 3 days then the diagnosis should be reassessed and therapy re-evaluated. Reassessment is required if signs of swelling and tenderness persist after antimicrobial therapy is completed although in some cases symptoms take longer than this to settle. Surgical assessment may
be appropriate in these cases.

Sexual partners

If the epididymo-orchitis is caused by, or likely to be caused by, a sexually transmitted pathogen such as *N. gonorrhoeae* or *C. trachomatis* then sexual contacts must be evaluated. All partners should be treated epidemiologically.

Differential diagnoses to consider in these circumstances include:

- testicular ischaemia/infarction
- abscess formation and/or scrotal fixation
- testicular or epididymal tumour
- mumps epididymo-orchitis
- tuberculous epididymitis
- fungal epididymitis

Sexually Acquired Reactive Arthritis

Introduction

Reactive arthritis (ReA) is a sterile inflammation of the synovial membrane, tendons and fascia triggered by an infection at a distant site, usually gastro-intestinal or genital. ReA triggered by a sexually transmitted infection (STI) is referred to as sexually acquired reactive arthritis (SARA). This includes sexually acquired Reiter's syndrome, described as the triad of urethritis, arthritis and conjunctivitis, with or without other cutaneous or mucous membrane lesions such as, keratoderma blennorrhagica, circinate balanitis/ vulvitis, uveitis, oral ulceration, cardiac or neurological involvement. Most commonly lower genital tract infections, either urethritis or cervicitis, are associated with SARA with objective features of SARA being present in 0.8-4% of cases.

Aetiology

- Chlamydia trachomatis, the commonest identifiable cause of non-gonococcal urethritis (NGU), has been the micro-organism most strongly linked to SARA.
- Neisseria gonorrhoeae (distinct from its role in septic, gonococcal arthritis).
- Ureaplasma urealyticum may be a cause of SARA in a minority.
- A causal role for other genital tract pathogens and commensals is possible but there is insufficient evidence for evaluation.

SARA appears to occur over ten times more frequently in men compared to women. Possession of the HLA-B27 gene increases susceptibility to SARA by up to 50 fold. It is possible that the persistence of viable micro-organisms intra-articularly is an important factor in the causation and perpetuation of the arthritis.

Clinical Features

Symptoms

- A recent history of urethral discharge and/or dysuria.
- Pain, with or without swelling and stiffness, at one or more (usually less than 6) joints, especially at the knees and feet. Onset of arthritis within 30 days of sexual contact.
- Pain and stiffness at entheses, especially the posterior and plantar aspect of the heels which often results in difficulty in walking.
- Painful movements may also result from tenosynovitis and painful swelling of a toe or finger (dactylitis) may occur.
- Low back pain and stiffness is common in the acute episode and sacro-iliitis may occur in the acute episode.
- Irritable eyes, with or without redness, photophobia or a reduction in visual acquity. Conjunctivitis is common among patients with SARA but iritis is less common.
- Systemic symptoms of malaise, fatigue and fever may occur.

Signs

- Genital infection, manifest in men by urethritis, urethral discharge and/or epididymo-orchitis and in women by muco-purulent cervicitis, with or without easily induced cervical bleeding, and/or abdominal pain.

- Arthritis, almost invariably affecting 1-5 lower limb joints in an asymmetrical distribution. Persistent small joint involvement may be erosive. Upper limb involvement is rare in the absence of psoriasis.
- Enthesopathy - Tenderness, with or without swelling at the sites of tendon or fascial attachments, especially the Achilles tendon and plantar fascia attachments to the calcaneum.
- Tenosynovitis - Tenderness, with or without swelling over tendon sheaths and crepitus on movement. Classical dactylitis may be seen.
- Pain on direct sacral pressure may indicate acute sacro-iliitis.
- Pain and redness of the eye is usually due to conjunctivitis, or rarely iritis. Slit lamp examination is essential to differentiate them. Rarely, corneal ulceration, keratitis and intra-ocular haemorrhage may be seen and optic neuritis and posterior uveitis have been described.
- Psoriasiform rash which may be typical plaque or guttate cutaneous psoriasisn or typical psoriatic lesions of the glans penis or labia (circinate balanitis or vulvitis) tongue (geographical tongue) or pustular psoriasis on the soles of the feet (keratoderma blennorrhagica) The latter may rarely occur on the palms of the hands. Stomatitis and oral ulceration also may occur.
- Heart lesions are almost invariably asymptomatic although tachycardia and rarely pericarditis and aortic valve disease may occur. Electrocardiographic abnormalities, including conduction delay, are recorded in some patients.
- Renal pathology, such as proteinuria, microhaematuria and aseptic pyuria, is seen in half the patients.
- Rare manifestations include thrombophlebitis of the lower limbs, subcutaneous nodules, nervous system involvement including meningoencephalitis and nerve palsies.
- Fever and weight loss occur in a minority of patients.

Complications

In the majority of individuals with SARA the disease is self-limiting with mean first episode duration of 4-6 months. Approximately 50% have recurrent episodes at variable intervals. The complications of SARA are principally due to aggressive arthritis and are more likely if the individual possesses the HLA-B27 gene.

- Chronicity with symptoms persisting for more than one year in approximately 17% of patients.
- Erosive joint damage especially affects the small joints of the feet with 12% exhibiting foot deformities, although severe deformity is rare.
- Persistent locomotor disability occurs in approximately 15%, principally due to erosive damage with deformity of the metatarsophalangeal, ankle or knee joints, or as a consequence of sacro-iliitis or spondylitis.
- Inadequately treated, or recurrent, acute anterior uveitis may lead rapidly to cataract formation and blindness in a minority.

Diagnosis

- Recognition of the typical clinical features of spondyloarthropathy.
- Demonstration of evidence of genito-urinary infection by the identification of: -
  Urethritis in men. Urethral discharge, dysuria and/or epididymo-orchitis may be present. Asymptomatic cases are not infrequent. Microscopic confirmation is by a Gram stained urethral smear demonstrating >= 5 polymorphonuclear leucocytes (PMNLs) per high power (x1000) microscopic field, or >= 10 PMNLs per high power (x1000) microscopic
  field on a first void urine sample.
  Muco-purulent cervicitis in women. A purulent or muco-purulent endocervical exudate, with or without easily induced cervical bleeding, and/or lower abdominal pain may be present. However, cervical infection is frequently asymptomatic.
- The identification of genital pathogens, particularly *C. trachomatis* or *N. gonorrhoeae*.
- Full screening for STIs.

Other useful investigations

- Erythrocyte sedimentation rate (ESR).
- Full blood count.
- Urinalysis.
- Ophthalmic evaluation including slit lamp assessment.
- X-rays of affected joints and sacro-iliac joints.
- Liver and kidney function tests.
- HLA-B27.
- Electrocardiogram.
- Echocardiogram.
- Blood cultures.
- Stool culture (if enteritic ReA is suspected).
- Synovial fluid analysis for cell count, Gram stain, crystals, and culture.
- Synovial biopsy.

Management

General advice

The principles of management are governed by the expectation that SARA is a self-limiting disease in the majority of patients. Patients should be advised to avoid unprotected sexual intercourse until they and their partner(s) have completed treatment and follow-up for any genital infection identified. Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves and their partner(s).

Venereologists are advised to liaise with other specialists including rheumatologists, opthalmologists and dermatologists for all patients with significant involvement of extra-genital systems.

Treatment

- Antimicrobial therapy for any genital infection identified should be as in uncomplicated infection.
- Rest.
- Non steroidal anti-inflammatory drugs (NSAIDs).
- Patients need to be referred to relevant experts for management of arthritis, enthesitis, skin/mucous membrane lesions and eye lesions. Slit lamp assessment is essential to diagnose uveitis, which if untreated may result in irreversible visual loss.

Sexual partners

Partner notification, treatment, and the contact tracing period is dependent on the genital infection identified.

Prophylaxis

In addition to the advice to avoid unprotected sexual intercourse until they and their partner(s) have completed treatment and follow up for any genital infection identified, patients should be advised to avoid potentially 'triggering infections' in the future, either urogenital or enteric. Hence, safer sexual practice should be discussed and the importance of food hygiene stressed.

Prostatitis

Acute Prostatitis

Aetiology

Acute prostatitis is caused by urinary tract pathogens. These include:
- Gram negative organisms ; *Escherichia coli, Proteus* spp, *Klebsiella* spp and *Pseudomonas* spp
- Enterococci
- *Staphylococcus aureus*
- Rarely anaerobes such as *Bacteroides* spp, *Gonorrhoea*, and *Chlamydia*

Clinical features

Symptoms

- dysuria, frequency and urgency
- low back pain, perineal, penile and sometimes rectal pain
- fever and rigors, arthralgia and myalgia

Signs

- an extremely tender, swollen and tense, smooth textured prostate gland which is warm to touch
- pyrexia and tachycardia

Complications

Patients with acute prostatitis may present with acute retention of urine secondary to prostatic oedema

Diagnosis

- Mid-stream urine sample for full report, culture and antibiotic sensitivity.
- Blood cultures for bacteria and antibiotic sensitivity.
  (Prostatic massage should not be performed on patients with acute bacterial prostatitis. This would be extremely painful, could precipitate bacteraemia, and is likely to be of little benefit as pathogens are almost always isolated from urine.)

Further investigations

Screen for other sexually transmitted infections.

Management

Patients suspected to be having acute prostatitis should be managed in a surgical unit.

General Advice

Adequate hydration should be maintained, rest encouraged and analgesics such as nonsteroidal anti-inflammatory drugs could be used.

Treatment

- As acute prostatitis is a serious and severe illness empirical therapy should be started immediately.
- Parenteral or oral treatment should be selected according to the clinical condition of the patient. If there is deterioration or failure to respond to oral therapy urgent admission and parenteral therapy should be arranged.
- If acute retention occurs suprapubic catheterisation should be performed to avoid damage to the prostate.

Recommended Treatments

- A high dose broad spectrum cephalosporin – for example, cefuroxime, cefotaxime or ceftriaxone plus gentamycin
- When clinically improved the therapy can be switched to oral treatment according to sensitivities.
  For patients suitable for oral therapy, quinolones can be used.
- Ciprofloxacin 500mg twice daily for 28 days
  or
- Ofloxacin 200mg twice daily for 28 days

Allergy

For patients intolerant of, or allergic to, quinolones an alternative is:

- Cotrimoxazole (TMP-SMX) 960mg twice daily for 28 days

Sexual partners

Treatment of sexual partners is not required as caused by uropathogens

Follow-up

Follow up in STD clinic is necessary if an associated STI is diagnosed.

Chronic Prostatitis

Introduction

Chronic prostatitis can be differentiated into

- Chronic bacterial prostatitis (CBP)
- Chronic abacterial prostatitis (CAP) - chronic pelvic pain syndrome (CPPS) – inflammatory
- Chronic abacterial prostatitis (CAP) - chronic pelvic pain syndrome (CPPS) - non-inflammatory (Prostatodynia)

  Many experts believe that CAP/CPPS inflammatory and non-inflammatory are variations of one condition. Bacterial prostatitis (acute or chronic) is uncommon compared with CAP

Aetiology

CBP is characterised by the recovery of pathogenic bacteria, in significant numbers, from prostatic fluid in the absence of concomitant urinary infection. Usual causative bacteria are those causing acute bacterial prostatitis, most commonly, E coli. Gram positive organisms -Staphylococcus aureus, Streptococcus faecalis, enterococci.

The aetiology of chronic abacterial prostatitis conditions is unknown. Most evidence suggests that *Chlamydia trachomatis* is not a significant cause of CAP/CPPS.

There is evidence that CAP/CPPS is caused by some form of persistent antigen within the prostate gland. This antigen may be an organism/remnant or could be a constituent of urine which has refluxed into the gland.

Clinical features

Symptoms

Chronic prostatitis has no standardised clinical definition despite being well recognised in clinical practice. It is characterised by a variety of symptoms most of which involve genital pain. These include:

- perineal pain
- lower abdominal pain
- penile pain (especially penile tip)
- testicular pain
- ejaculatory discomfort or pain
- rectal and lower back pain
- dysuria.

Attempts have been made to evaluate the symptoms of chronic prostatitis and reports suggest the first five symptoms listed above are more favourable towards diagnosis. Symptoms should have been present for at least 6 months to diagnose chronic prostatitis although in practice the diagnosis is made after a shorter duration of symptoms.

Signs

There are few objective clinical signs and the prostate gland may, or may not, be locally or diffusely tender to palpation.

Diagnosis

The investigation of chronic prostatitis which has been the standard for evidence based research is the lower urinary tract localisation procedure (Stamey test). Although time consuming this is the most accurate method for differentiating CBP, CAP/CPPS inflammatory and CAP/CPPS-non-inflammatory. When the patient attends for prostatic massage:

- No antibiotics should have been taken for one month.
- The patient should not have ejaculated for two days.
- The patient should have a full but not distended bladder.

Prostatic massage should not be performed if there is evidence of urethritis or urinary tract infection.

Prostatic massage

The foreskin should be fully retracted and the penis well cleaned to prevent contamination.

- A 5-10 ml sample of first-void urine (VB1) should be collected.
- The patient should urinate a further 100-200 ml urine and then a further 5-10 ml sample of mid-stream bladder urine (VB2) should be collected.
- By digital rectal examination a firm massage of the prostate gland should be performed for 1 minute, from periphery towards the midline with a sterile container held over the glans to collect any expressed prostatic secretions (EPS).
- A wet preparation microscopic examination of a sample of expressed prostatic secretions should be made to determine the number of polymorphonuclear leucocytes (PMNL) per high power field (x 400).
- Immediately after the massage another 5-10 ml post-massage urine (VB3) should be collected.

- All three urine samples (VB1 – 3) should have microscopy and quantitative culture.

A dry prostatic massage is reasonably common

Interpretation of results

- To assign an organism to the prostate the colony count in the EPS and VB3 is required to be at least 10 times greater than in VB1-2.
- For prostatic inflammation ≥10 PMNL/high power field (x 400) is considered diagnostic
  In cases of a dry expressate a PMNL count of 10/hpf (x 400) greater in VB3 than VB1 and VB2 is diagnostic of prostatitis.
- If there is significant bacteruria in both VB2 and VB3, three days of nitrofurantoin 50mg four times daily, which is not prostate penetrating, should be given and the procedure then repeated.
- An EPS pH ≥8 suggests prostatitis although it is not diagnostic.
- Clumping of PMNL and presence of lipid laden macrophages suggests prostatitis, although not diagnostic.

Management

General advice

Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for their health.

Treatment of Chronic Bacterial Prostatitis

Treatment should be chosen according to antimicrobial sensitivities.
For patients with CBP first-line treatment is with a quinolone such as :

- Ciprofloxacin 500mg orally twice daily for 28 days
  or
- Ofloxacin 200mg orally twice daily for 28 days
  or
- Norfloxacin 400mg orally twice daily for 28 days

Allergy

For those allergic to quinolones:

- doxycycline 100mg orally twice daily for 28 days or
- Co-trimoxazole (TMP-SMX) 960mg orally twice daily for 28 days

Traetment of chronic abacterial prostatitis/chronic pelvic pain syndrome

There are no universally effective treatments for CAP/CPPS. Treat as for CBP with a quinolone or tetracycine.

- Non-steroidal anti-inflammatory drugs (CAP/CPPS-inflammatory)
- Stress management - No specific therapy has been tested or advocated although referral for psychological assessment may be appropriate in some. Diazepam 5mg twice daily for 90 days has produced symptomatic benefit although benzodiazepines are not recommended in clinical practice because of dependency.

Sexual partner

Partner notification and empirical treatment is not required unless a specific sexually transmitted pathogen is found at initial screening.

Follow-up

Chronic prostatitis is a difficult to manage, relapsing condition and patients are typically followed up for long periods of time. No specific follow-up recommendations can be made.

Chancroid

Aetiology

Haemophilus ducreyi is the microbial agent of chancroid. Chancroid is characterized by ano-genital ulceration and lymphadenitis with progression to bubo formation. The incubation period ranges between 3 to 10 days, and the initial lesion may progress rapidly to form an open sore. There are no prodromal symptoms.

Symptoms and signs

The ulcer is classically described as:

- Single or (often) multiple
- Not indurated ("soft sore")
- With a necrotic base and purulent exudate
- Bordered by ragged undermined edges
- Bleeding easily on contact
- Painful: a distinctive feature, more common in men than in women, depending on the site of inoculation

In males, most ulcers are found on the prepuce near the frenulum or in the coronal sulcus.
In females, most lesions are found at the entrance of the vagina, particularly the fourchette.
Several lesions may merge to form gigantic ulcers.

Painful inguinal adenitis is a characteristic feature of chancroid and may be present in 50% of cases. The adenitis is unilateral in most patients. Buboes form and can become fluctuant and rupture, releasing thick pus, resulting sometimes in extensive ulceration.

Complications

Mostly seen in men, these may include phimosis and partial loss of tissue, particularly on the glans penis (so called "phagedenic" ulcers).

Diagnosis

The combination of a painful genital ulcer and tender suppurative inguinal adenopathy suggest the diagnosis of chancroid.

- *Culture* of material obtained from the ulcer base or from pus aspirated from the bubo.
- *Microscopy* of a Gram stained smear (or other stains) of material from the ulcer base or of pus aspirate from the bubo: demonstration of characteristic gram-negative bacilli grouped in chains or 'school of fish" arrangement. The test has low sensitivity [50%] and is not recommended as a diagnostic test Other investigations
- Screening for other sexually transmitted diseases.
- Biopsy of lymph nodes may be required to exclude neoplasia.

Management

General advice

(1) Patients should be advised to avoid unprotected sexual intercourse until they and their partner(s) have completed treatment and follow-up.

(2) Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves and their partner(s).

Treatment

Successful treatment of chancroid should cure infection, resolve clinical symptoms, and prevent transmission to sexual partners.

Recommended Regimens:

- Erythromycin base 500 mg orally four times a day for 7 days
  or
- Azithromycin 1 g orally in a single dose
  or
- Ceftriaxone 250 mg intramuscularly (IM) in a single dose
  or
- Ciprofloxacin 500 mg orally two times a day for 3 days

Treatment for pregnant or lactating mothers and children

The safety of azithromycin for pregnant and lactating women has not been established. The erythromycin or ceftriaxone regimens should be used. No adverse effects of chancroid on pregnancy outcome or on the fetus have been reported.

Special considerations

HIV infection
Patients co-infected with HIV should be closely monitored.
Single dose ceftriaxone and azithromycin regimens should be used among persons known to be infected with HIV only if follow-up can be assured; if not, the full-dose erythromycin 7-day regimen is recommended.

Management of buboes

The classic strategy has been to needle-aspirate fluctuant buboes from adjacent healthy skin. The procedure is simpler and safer than incision, which is prone to complications (sinus formations). This procedure should always be performed under effective antibiotic cover.

Follow-up

The time required for complete healing is related to the size of the ulcer (and perhaps HIV-related immunosuppression); large ulcers may require more than 2 weeks.
Clinical resolution of fluctuant lymphadenopathy is slower than that of ulcers and may require frequent needle aspiration (or drainage).

Sexual partner(s) management

Persons who have had sexual contact with a patient who has chancroid within the 10 days before the onset of the patient's symptoms should be examined, and treated even in the absence of symptoms, as asymptomatic carriage of *H. ducreyi* has been proven to occur [epidemiological treatment].

Lymphogranuloma Venereum (LGV)

Introduction:

Lymphogranuloma venereum (LGV) is a systemic disease caused by *Chlamydia trachomatis*. Since 2003 there have been a series of LGV outbreaks reported in several European cities.

Aetiology:

Lymphogranuloma venereum (LGV) is a systemic disease caused by one of three invasive serovars L1, L2, or L3 of *Chlamydia trachomatis*. *Chlamydia trachomatis* serovars L1-L3 are lymphotropic.

Symptoms and signs:

The incubation period is extremely variable (range 3-30 days) from time of sexual contact with an infected individual. The clinical course of LGV is classically divided into three stages.

PRIMARY LESION

The primary lesion is transient and often imperceptible, in the form of a painless papule or pustule or shallow erosion; it is found on the coronal sulcus of males and on the posterior vaginal wall, fourchette or on the vulva, and occasionally on the cervix of females. Extra-genital lesions have been reported such as in the oral cavity (tonsil) and extra-genital lymph nodes.

SECONDARY LESIONS, LYMPHADENITIS, OR LYMPHADENOPATHY OR BUBO

- The most common clinical manifestation of LGV is tender inguinal and/or femoral lymphadenopathy that is typically unilateral (two thirds of cases). It may involve one lymph node or the entire chain, which can become matted. with considerable periadenitis and bubo formation, may ulcerate and discharge pus from multiple points, creating chronic fistulae. Regional dissemination will be characterised by inflammation and swelling of lymph nodes and surrounding tissue.

- When both inguinal and femoral lymph nodes are involved, they may be separated by the inguinal ligament leading to the so-called "groove sign". Though considered pathognomonic of LGV, the "groove sign" only occurs in 15-20% of cases.

- Lymphadenopathy commonly follows the primary lesion by a period of a few days to weeks (10-30 days, rarely months).
  The systemic spread of *Chlamydia trachomatis* may be associated with fever, arthritis, pneumonitis, splenomegaly and rarely perihepatitis (Fitz-Hugh-Curtis syndrome).

TERTIARY STAGE OR THE GENITO-ANO-RECTAL SYNDROME

- The vast majority of patients recover after the secondary stage without sequelae, but in a few patients the persistence or progressive spread of *Chlamydia trachomatis* in anogenital tissues will incite a chronic inflammatory response, and destruction of tissue in the involved areas, including: proctitis, acute proctocolitis mimicking Crohn's disease, fistulae, strictures and chronic granulomatous disfiguring condition of the vulva ("esthiomene", Greek word meaning "eating away"). These conditions occur most frequently among women and among homosexual men.

LONG TERM COMPLICATIONS

- The destruction of lymph nodes may result in lymphoedema of genitals (elephantiasis) with persistent suppuration and pyoderma.

Diagnosis

The diagnosis of LGV is often differential, after other causes of genital ulcerations or inguinal lymphadenopathy have been ruled out. Even when LGV is suspected, investigations for other potentially co-existing sexually transmitted infections must be undertaken, in particular for syphilis.

Positive diagnosis of LGV is difficult, requiring a combination of good clinical acumen and supportive investigations. LGV can be suspected on positive chlamydial serology, isolation of *Chlamydia trachomatis* either from the infected site or histological identification of chlamydia in infected tissue.

COLLECTION OF GENITAL SPECIMENS

Chlamydiae are intracellular organisms therefore samples must contain cellular material which can be obtained:
- from ulcer base exudate or from rectal tissue.
- by aspiration from fluctuant lymph nodes or buboes.

MAIN DIAGNOSTIC TECHNIQUES

- *Detection of nucleic acid (DNA)* by amplification techniques (NAATs) such as the ligase chain reaction (LCR) or the polymerase chain reaction (PCR); Positive samples should be confirmed by real-time PCR for LGV specific DNA.
- *Culture* on cycloheximide-treated McCoy cells of material from suspected LGV lesion is the most specific method.
- *Chlamydia trachomatis serology*. Three types of techniques have been used. In general a four-fold rise of antibody (both IgM and IgG) in the course of suspected illness is diagnostic of active infection. Alternatively, single point titres of >1/64 and >1/256 have been considered positive.

Other investigations:

Lymph node biopsy may be used to make differential diagnoses with atypical infections and neoplasia. Screen for other sexually transmitted diseases.

Management

General Advice

(1) Patients should be advised to avoid unprotected sexual intercourse until they and their partners(s) have completed treatment and follow-up.

(2) Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves and their partners(s).

Treatment

Prolonged treatment (at least 3 weeks) is the norm and more than one course of therapy, alternating some of the antibiotics listed below may be necessary for chronic cases.

Recommended Regimens

Doxycycline 100mg twice daily orally for 21 days
or
Erythromycin 500mg four times daily orally for 21 days.

Alternative Regimens

The activity of azithromycin against *Chlamydia trachomatis* suggests that it may be effective in multiple doses over 2-3 weeks.

Treatment for pregnant or lactating mothers

Pregnant and lactating women should be treated with the erythromycin regimen.

Follow-up

Patients should be followed clinically until signs and symptoms have resolved. This may occur within 3-6 weeks.

Management of complications

Fluctuant buboes should be aspirated through healthy adjacent skin and surgical incision is usually contra-indicated.
Patients with fibrotic lesions or fistulae are beyond the stage where chemotherapy can be used and surgical repair, including reconstructive genital surgery, often must be considered.

Sexual partner/s management

Persons who have had sexual contact with a patient who has LGV within the 30 days before onset of the patient's symptoms should be examined, tested and treated, or receive presumptive treatment (eg. azithromycin 1.0g orally or doxycycline 100mg twice daily for 7 days have been used).

LGV and HIV

Latent LGV may be reactivated in patients with HIV infection with development of multiple abscesses. HIV infected patients should be treated following the regimens previously cited. It had been suggested that prolonged therapy may be required and delay in resolution may occur. However, data from the recent LGV epidemics in Europe and data from South Africa showed that HIV-1 co-infection was not associated with a decreased response to treatment.

Auditable Outcome Measures

- Sexual partners should be treated.
- HIV and syphilis serological testing should be offered, as well as screening for concomitant STI (eg. gonorrhoea).

Donovanosis (granuloma inguinale)

Introduction

Donovanosis is a sexually transmitted infection that usually manifests itself as genital ulceration. There have been no recent reports of donovanosis in Sri-Lanka. However it is endemic in India, PNG, Caribbean, Brazil, Guana, South Africa, Zambia, Vietnam and Australia.

Aetiology

The causative organism formerly, *Calymmatobacterium granulomatis* has recently been officially redesignated as *Klebsiella granulomatis*.

Symptoms and signs

- At site of primary inoculation: one or more papules/nodules developing into friable ulcers or hypertrophic lesions which gradually increase in size. Lesions tend not to be painful.
- Regional lymph nodes: initially swelling of the nodes, followed particularly in case of inguinal nodes, by spread of infection into overlying tissues, resulting in either abscess formation (pseudobubo) or ulceration of the overlying skin.

Untreated infections may either resolve spontaneously or persist and slowly spread.

Complications:

- haemorrhage,
- genital lymphoedema,
- genital mutilation and cicatrisation,
- squamous cell carcinoma [rare]

Diagnosis:

The main method of diagnosis is the demonstration of Donovan bodies in either:

- cellular material taken by scraping/impression smear/swab crushing of pinched off tissue fragment onto glass slide
  or
- tissue sample collected by biopsy.

Smears can be stained with Giemsa, Wright's stain, or Leishman stain. Biopsies are best stained with silver stains (for example, Warthin-Stary) or Giemsa.

Donovan bodies appear as cocobacilli within large vacuoles in the cytoplasm of histiocytes and occasionally in other cells. The organisms are blue-purple in colour and surrounded by a prominent capsule. Typical bacteria resemble "closed safety pins".

<u>Other investigations</u>

Screen for other sexually transmitted diseases

Management

All patients with active lesions shown to contain Donovan bodies should receive antimicrobial treatment. Patients with a clinical diagnosis of the disease should be given presumptive treatment. Duration of treatment should be until lesions have healed. Healing times vary greatly between patients. CDC recommends a minimum of 3 weeks' treatment.

Recommended Regimens

- Doxycycline 100 mg twice daily or
- Erythromycin 500 mg four times daily or
- Azithromycin 1 g weekly or 500 mg daily orally or
- Ceftriaxone 1 g daily IM/IV or
- Co-trimoxazole 960 mg twice daily or
- Norfloxacin 400 mg twice daily or

Treatment for pregnant or lactating mothers

Doxycycyline, co-trimoxazole, and norfloxacin are not recommended for pregnant or lactating women. Erythromycin has been used successfully in pregnant women with donovanosis. Children born to mothers with untreated genital lesions of donovanosis are at risk of infection and a course of prophylactic antibiotics should be considered.

Follow up

Patients should be followed until symptoms have resolved.

Partner management

Any person with a history of unprotected sexual contact with a patient with active donovanosis or within 40 days before the onset of lesions should be assessed clinically for evidence of infection and offered treatment.

Balanitis

Aetiology

Balanitis and posthitis refer to inflammation of the glans penis and mucosal surface of the prepuce respectively. When both conditions coexist, it is referred as balanoposthitis. This is a condition with varying aetiologies. (see table 1)

Table 1 Factors causing balanitis

Infectious	**Skin disorders**	**Miscellaneous**
Candida albicans *Trichomonas vaginalis*	Circinate balanitis Lichen sclerosus (balanitis xerotica obliterans)	Trauma Irritant
Streptococci (Group A and B)	Zoon's balanitis	Poor hygiene
Anaerobes	Erythroplasia of Queyrat	Contact allergy
Gardnerella vaginalis	Pemphigus	Fixed drug eruption
Staphylococcus aureus	Lichen planus	Stevens- Johnson syndrome
Mycobacteria	Bowen's disease	
Entamoeba histolytica	Psoriasis	
Syphilis		
Herpes simplex		
Human papillomavirus		

Clinical Features

Symptoms

Local rash - may be scaly or ulcerated
Soreness, itch, odour
Cracks on the prepuce, inability to retract the foreskin
Discharge from the glans or underneath the foreskin

Signs

Genital:

Erythema, reddish papules, scaling, ulceration, fissuring, crusting, exudates, oedema, leukoplakia, sclerosis, purpurae, odour, phimosis

General:

Lymphadenopathy (local or general), non-genital rash, oral ulceration, arthritis

Complications

Phimosis
Meatal stenosis
Malignant transformation

Diagnosis

Appearance may be pathognomonic in some situations and a clinical diagnosis can be made.

The following investigations may be useful in the diagnosis:

- Sub preputial smear for Candida
- Sub preputial swab for bacterial culture if facilities available
- HSV- culture, Elisa, giant cells,
- DG and syphilis serology if ulceration present.
- Wet smear for *Trichomonas vaginalis* - particularly if a female partner has an undiagnosed vaginal discharge
- If circinate balanitis is present, screen for *Chlamydia trachomatis* infection
- Urine/ blood analysis for glucose - if candidal infection is suspected.

Biopsy is indicated if the diagnosis is uncertain or if the condition persists in spite of treatment.

Management

General Advice

Advice the patient to maintain good preputial hygiene by taking daily baths. Wash with a weak salt solution twice daily while symptoms persist. Avoid soaps and other irritants while inflammation is present. Avoid synthetic and other tight fitting clothing.

Advise about the effect on condoms if creams are being applied.

Infective balanitis

Candidal balanitis

Symptoms

Erythematous rash, with soreness and /or itch

Signs

Blotchy erythema with small papules which may be eroded, or dry
Dull red areas with glazed appearance.

Investigations

Sub-preputial smear – dry smear or KOH wet smear
Culture for candida

Treatment

Recommended regimens
Clotrimazole cream 1% or miconazole cream 2% Apply twice daily until symptoms resolve.

Alternative regimens
Fluconazole 150mg stat orally - if symptoms are severe

Clotrimazole or miconazole with 1% hydrocortisone - if marked inflammation is present

If resistance suspected culture and sensitivity testing should be considered where facilities are available
or
Nystatin cream 100 000 units/gm can be used in cases of resistance or allergy to azoles.

Sexual partners

Offer screening for partners if they are symptomatic

Follow up

As necessary

Anaerobic balanitis

Symptoms

foul smelling discharge, swelling and inflammation of glans

Sign

preputial oedema, subpreputial dischare , superficial erosions, inguinal adenitis. Milder forms also occur.

Investigations

Sub-preputial culture if facilities available (to exclude other causes)

Treatment

Recommended regimen
Metronidazole 400mg twice daily for 1 week

Alternative regimen
Co-amoxiclav 375mg three times daily for 1 week

Sexual partners

Screening of sexual partners not required

Follow up

As necessary

Aerobic balanitis

Streptococci Group A, Staphylococcus aureus and *Gardnerella vaginalis* have all been reported as causing balanitis. Other organisms may also be involved.

Investigations

Sub-preputial culture if facilities available

Treatment

Co-amoxiclav 375mg three times daily for 1 week
plus
Metronidazole 400mg twice daily for 1 week

Sexual partners

Screening of sexual partners not required

Follow up

As necessary

Diagnosis and treatment of balanitis due to genital HSV infection, trichomonas vaginalis and syphilis is as per specific guidelines

Lichen sclerosus (previously known as balanitis xerotica obliterans)

Symptoms

Itching, irritation, burning and prickling sensation in the prepuce and glans penis, haemorrhagic vesicles mostly after sexual exposure, difficulties in micturition, non retractile prepuce

Signs

Typical Appearance: white plaques on the glans, often with involvement of the prepuce. There may be haemorrhagic vesicles and rarely blisters and ulceration. The prepuce may become phimotic, and there may be associated meatal stenosis. There may be a perimeatal erythematous area becoming whitish in few weeks.

Diagnosis

Definitive diagnosis is following biopsy

Treatment

Recommended regimen

Soap and other irritants should be avoided
Emollients - aqueous cream can be used as a soap substitute.
Potent topical steroids (e.g. Clobetasol proprionate or Betamethasone valerate) applied once or twice daily until remission, then gradually reduced. Intermittent use(e.g. once weekly) may be required to maintain remission.

Alternative treatment
Circumcision if phimosis develops
Surgery for meatal stenosis

Follow up

Patients should be followed up regularly. The frequency will depend on the disease activity and symptoms of the patient but all patients should be reviewed at least once in 6 months due to the small risk of malignant transformation.

Sexual partners

Screening of sexual partners not required

Zoon's (plasma cell) balanitis

This is a benign condition which can recur. But Erythroplasia of Queyrat which is a premalignant condition can present similar to this and biopsy is advisable to confirm the diagnosis of Zoon's balanitis.

Symptoms

Pain, irritation, sub preputial discharge

Sign

Typical appearance: well circumscribed orange-red glazed areas on the glans with multiple pinpoint red spots - "cayenne pepper spots".

Diagnosis

Definitive diagnosis by biopsy

Treatment

Recommended regimens
Mild to moderately potent topical steroid preparations applied once or twice daily till the lesions resolve

In recurrent cases or if there is poor response to topical treatment, circumcision might lead to the resolution of lesions

Follow up

Assess the response to topical steroids treatment and resolution of lesions. If topical steroids are being used long term look for the presence of side effects.

If poor response or diagnosis is uncertain, penile biopsy should be performed.

Circinate balanitis

Symptoms

Presence of lesions in the glans penis. Usually associated with other symptoms of Reiter's syndrome

Signs

Typical Appearance: greyish white areas on the glans which coalesce to form "geographical" areas with a white margin. Usually it is associated with features of Reiter's syndrome.

Screen for other STIs

Treatment

Recommended Regimen
1% Hydrocortisone cream applied twice daily for symptomatic relief.
(More potent topical steroids may be required in some cases).

Treat any underlying infection

Sexual partners

If an STI is diagnosed the partner(s) should be screened and treated.

Follow up

As necessary

Fixed drug eruptions

A drug history is essential. Common precipitants include sulphanomides, tetracyclines, salicylates, barbiturates.

Symptoms

Burning, pain, ulcers and /or bullous lesions that tend to recur in the same site

Signs

Typical Appearance: is variable but lesions are usually well demarcated and erythematous, but can be bullous with subsequent ulceration.

Treatment

Discontinue the offending drug.
Warm salt water washes if ulcerated
Topical steroids - e.g. 1% hydrocortisone applied twice daily until resolution.
Systemic steroids may be required if the lesions are severe
Antihistamines.

Follow up

As required.
Patients should be advised to avoid the precipitant.

Irritant / allergic balanitis

Symptoms

Itching, irritation, soreness, burning, redness. In severe cases- discharge, erosions, ulceration may be seen. In irritant balanitis symptoms usually appear shortly after contact with an irritant where as in allergic balanitis symptoms occur within 2- 4 days after contact with the offending substance.

Signs

Mild erythema to widespread oedema, erosions and ulceration of the penis.

Treatment

Avoidance of precipitants
Saline or warm salt water washes twice daily

Hydrocortisone 1% applied once or twice daily until resolution of symptoms
Emollients - Aqueous cream: applied as required and used as a soap substitute.

Follow up

As required.
Patients should be advised to avoid the precipitant.

Premalignant conditions

Erythroplasia of Queyrat

Typical Appearance: red, velvety, well circumscribed area on the glans. May have raised white areas, but if indurated suggests frank squamous cell carcinoma.

Bowen's Disease

Scaly, discrete, erythematous plaque. Up to 20 % will develop into frank squamous carcinoma.

Bowenoid papulosis

Lesions range from discrete papules to plaques.

Diagnosis of the above premalignant conditions

Definitive diagnosis is by biopsy

Treatment

Refer to a dermatologist.
Local excision is usually adequate and effective.

Range of other skin conditions may affect the glans penis. These include psoriasis, lichen planus, seborrheic dermatitis, pemphigus and dermatitis artefacta. These patients should be referred to a dermatologist .

Scabies infestation

Aetiology

- The infestation is caused by the mite *Sarcoptes scabiei*.
- Any part of the body may be affected, and transmission is by skin-to-skin contact.

Clinical features

Symptoms

- Symptoms may appear 4 to 6 weeks after exposure.
  The main symptom is generalised itch – more intense at night.

Signs

- Characteristic lesions may be seen in the skin where mites have burrowed.
- Common sites include the interdigital folds, the wrists and elbows, and around breast nipples in women.
- Papules or nodules that may result from itching often affect the genital area.
- In HIV infection, crusted lesions teeming with mites (Norwegian scabies) pose a significant risk of transmission to others.

Complications

- Secondary infection of the skin lesions can occur following repeated scratching.

Diagnosis

- The clinical appearance is usually typical , but there may be diagnostic confusion with other pruritic conditions such as eczema.
- Scrapings taken from burrows may be examined under light microscopy to reveal mites.

Management

General advice

- Patients should be advised to avoid close body contact until they and their partner(s) have completed treatment.
- Patients should be given a detailed explanation of their condition, and clear and accurate information on applying the treatment.

Further investigations

- Screening for other STIs should be undertaken.

Treatment

Recommended regimens

- Benzyl benzoate 25% - 3 consecutive days
- Permethrin 5% cream – 8-12 hours - should be applied to the whole body from the neck downwards and washed off after 12 hours usually overnight.
- Malathion 0.5% aqueous lotion – Washed off after 24 hours.

Itch may persist for several weeks. Application of crotamiton cream may give symptomatic relief and antihistamines may also be helpful.

Potentially contaminated clothes and bedding should be washed at high temperature (>50°C) if possible.

Mites separated from the human host die within 72 hours.

Crusted (Norwegian) scabies may be treated with oral Ivermectin in a dose of 200 mcg/kg.

Allergy

- Treatments to which there is known hypersensitivity should be avoided.

Pregnancy and breastfeeding

- Permethrin is safe during pregnancy and breastfeeding.

Sexual partners

- Current sexual partners as well as other members of the household should be examined and treated.

Follow-up

- The appearance of new burrows at any stage post-treatment is indicative of a need for further therapy, although in re-infection symptoms of pruritus may recur before typical burrows have developed.
- Pruritus persisting more than 2-4 weeks after treatment may reflect treatment failure, reinfection or drug allergy to anti-scabetics in addition to hypersensitivity to dead mite.

Phthirus pubis infestation

Aetiology

- The crab louse, *Phthirus pubis* is transmitted by close body contact.
- The incubation period usually ranges from 5 days to several weeks, although occasional individuals appear to have more prolonged, asymptomatic infestation.

Clinical features

Symptoms and signs

- Adult lice infest coarse hairs of the pubic area, body hair and rarely eyebrows and eyelashes.
- Eggs (nits) are laid which adhere to the hairs.
- The patient may be asymptomatic or may present with itching due to hypersensitivity to feeding lice.
- Blue macules (*maculae caeruleae*) may be visible at feeding sites.

Diagnosis

- This is based on finding adult lice and/or eggs. Magnifying lens may be helpful in visualizing.
- Examination under light microscopy can confirm the morphology if necessary.

Management

General advice

- Patients should be advised to avoid close body contact until they and their partner(s) have completed treatment and follow-up.
- Patients should be given a detailed explanation of their condition, and clear and accurate information on applying the treatment.

Treatment

Lotions are likely to be more effective than shampoos, and should be applied to all body hair including the beard and moustache if necessary.
A second application after 3-7 days is advised.

Recommended treatments

- Malathion 0.5%. Apply to dry hair and wash out after at least 2 hours and preferably 12 hours ie: overnight
- Permethrin 1% cream rinse. Apply to damp hair and wash out after 10 minutes
- Permethrin 5% cream. Leave for 8-12 hours.
- Phenothrin 0.2%. Apply to dry hair and wash out after 2 hours
  Removal of nits and lice with forceps.

Alternatively, an inert ophthalmic ointment with a white or yellow paraffin base such as simple eye ointment BP may be applied to the eyelashes twice daily for 8-10 days. This works by suffocating lice and avoids any risk of eye irritation by topical insecticide.

Allergy

• T reatments to which there is known hypersensitivity should be avoided.

Pregnancy and breastfeeding

• Permethrin is safe during pregnancy and breastfeeding.

Further investigations

• Screening for other STIs should be undertaken.

Sexual partners

• Current sexual partners should be examined and treated.

Follow-up

• Patients should be re-examined for absence of lice after 1 week.
• Treatment failures should be given an alternative from the above list.

Molluscum Contagiosum

Molluscum contagiosum (MC) is a benign viral skin infection most commonly seen in children. However, sexual contact in adults may lead to the appearance of lesions in the genital area. It is important to reassure the patient that the condition is harmless.

Aetiology

- Molluscum contagiosum is caused by a pox virus.
- The virus is probably passed on by direct skin-to-skin contact, and may affect any part of the body.
- Sexual contact may lead to the appearance of lesions in the genital area.
- There is anecdotal evidence associating facial lesions with HIV-related immunodeficiency.

Clinical features

Symptoms and signs

- After an incubation period of three to twelve weeks, discrete, pearly, papular, smooth or umbilicated lesions appear.
- In immunocompetent individuals the size of the lesions seldom exceeds 5 mm and if untreated, there is usually spontaneous regression after several months.

Complications

- Secondary bacterial infection may result if lesions are scratched.
- In the immunocompromised, eg: in HIV infection, lesions may become large and exuberant, and secondary infection may be problematic.

Diagnosis

- This is usually based on characteristic clinical appearance.
- The main differential diagnosis is with genital warts, which are neither smooth nor umbilicated.

Management

General advice

- As the natural history is of spontaneous regression of lesions, treatment is offered for cosmetic reasons only.

Recommended treatment

- Expression of the pearly core, either manually or using needles, forceps.
- Cryotherapy – apply liquid nitrogen until a halo of ice surrounds the lesion. Weekly applications may be necessary.
- Chemical cauterization with TCA or Podophyllin.
- Podophyllotoxin cream (0.5%) or Imiquimod 5% can be self-applied.
- Curettage or diathermy may be carried out under local anaesthesia.
- In patients with HIV infection, the introduction of highly active antiretroviral therapy may lead to resolution of lesions.

Allergy

Treatments to which there is known hypersensitivity should be avoided

Pregnancy and breastfeeding

- Cryotherapy and other purely destructive methods are safe.
- Podophyllin and Podophyllotoxin are contraindicated. Imiquimod should be used with caution.

Further investigations

- As other STIs may co-exist, screening for other STIs including HIV should be undertaken.

Sexual partners

- Contact tracing of partners is unnecessary.

Hepatitis B and C infections

Aetiology :

Caused by a picorna (RNA) virus.

Transmission:

- Faeco-oral (via food, water, close personal contact).
- Sexual contact (mainly anal sex) with an infectious partner.
- Patients are infectious for approximately two weeks before and one week after the jaundice.

Clinical Features :

Incubation Period: 15-45 days

Symptoms

Most children and up to half of adults are asymptomatic or have mild non-specific symptoms with little or no jaundice. In the more 'typical' case there are two phases of symptoms -

- *The prodromal illness*: flu-like symptoms (malaise, myalgia, fatigue), often with right upper abdominal pain. This phase lasts for 3-10 days. This is followed by -
- *The icteric illness:* jaundice (mixed hepatic and cholestatic) associated with anorexia, nausea and fatigue which usually lasts for 1-3 weeks. It can persist for 12 or more weeks in a minority of patients who have cholestatic symptoms (itching and deep jaundice). Fever is not found in this phase.

Signs

- None specific in the prodromal phase.
- Icteric phase - jaundice with pale stools and dark urine. Liver enlargement/tenderness and signs of dehydration are also common.

Complications are rare (Fulminant hepatitis complicates approximately 0.4% of cases).

Diagnosis

Serology

- Confirmed by a positive serum Hepatitis A virus - specific IgM (HAV-IgM)
  HAV-IgG does not distinguish between current or past infection

Other tests

- Liver function tests

Management

General Advice

- Patients should be advised to avoid food handling and unprotected sexual intercourse until they have become non-infectious

    - Mild to moderate cases - managed as out-patients with bed rest, proper hydration and supportive care.
    - Severe cases – admit to hospital and manage accordingly.

Prevention

- Hepatitis A vaccine schedule: doses at 0 and 6-12 months. Booster doses not indicated after the primary course in immunocompetent patients.

- There is a combined Hepatitis A+B vaccine given on the same schedule as the hepatitis B vaccine.

Hepatitis B virus infection

Aetiology :

Caused by a hepadna (DNA) virus.

Transmission :

- Sexual transmission

- Other routes are: parenteral (blood, blood products, drug-users sharing needles and syringes, needle-stick, acupuncture) and vertical (infected mother to infant)

Clinical Features: Incubation period 40-160 days.

Symptoms

- Virtually all infants and children have asymptomatic acute infection. Asymptomatic infection is also found in 10-50% of adults in the acute phase and is especially likely in those with HIV co-infection.

- The prodromal and icteric phases are very similar to hepatitis A, but may be more severe and prolonged.

Signs

- As for hepatitis A in the acute phase.

- If chronic infection occurs there are often no physical signs. After many years of infection, depending on the severity and duration, there may be signs of chronic liver disease.

Complications

- Fulminant hepatitis occurs in less than 1% of symptomatic cases but carries a worse prognosis than that caused by hepatitis A.

- Chronic infection (>6 months) occurs in 5-10% of symptomatic cases. Almost all (>90%) of infants born to infectious (HBeAg +ve) mothers will become chronic carriers unless immunised.

- Concurrent hepatitis C infection can lead to fulminant hepatitis, more aggressive chronic hepatitis and increased risk of liver cancer. Concurrent HIV infection increases the risk of progression to cirrhosis and death.

Diagnosis

Stage of infection	Surface antigen (HBsAg)	'e' antigen (HBeAg)	IgM anti-core antibody	IgG anti-core antibody	Hepatitis B virus DNA	Anti-HBe	Anti-HBs
Acute (early)	+	+	+*	+	+	-	-
Acute (resolving)	+	-	+	+	-	+/-	-
Chronic (high activity)	+	+/-	-	+	+	+/-	-
Chronic (low activity)	+	-	-	+	-	+/-	-
Resolved (immune)	-	-	-	+	-	+/-	+/-
Successful vaccination	-	-	-	-	-	-	+

Other tests

Liver function tests (LFT)
HBV-DNA levels
Screening for other sexually transmitted diseases where relevant
Ultrasound scan
Liver biopsy (for assessment of chronic disease)

Management

General Advice

- Patients should be advised to avoid unprotected sexual intercourse, including oro-anal and oro-genital contact until they have become non-infectious or their partners have been successfully vaccinated.
- Patients should be advised not to donate blood, semen or organs.
- Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves and their partner(s), routes of transmission of infection (see below) and advised not to donate blood.
- Hepatitis B is a notifiable disease

Treatment

• Treatment should be given by physician experienced in the management of liver disease.

Pregnancy and Breastfeeding

- Vertical transmission (mother to infant) of infection occurs in ninety percent of pregnancies where the mother is hepatitis B e antigen positive and in about ten percent of surface antigen positive, e antigen negative mothers. Most (>90%) of infected infants become chronic carriers.

- Infants born to infectious mothers are vaccinated from birth

- Infected mothers should continue to breast feed as there is no additional risk of transmission.

Sexual and Other Contacts

- Partner notification should be performed to include any sexual contact (penetrative vaginal or anal sex or oro/anal sex) or needle sharing partners.

- Specific hepatitis B immunoglobulin 500iu intramuscularly (HBIG) may be administered to a non-immune contact after a single unprotected sexual exposure or parenteral exposure/needle-stick injury if the donor is known to be infectious. This works best within 48 hours and is of no use after more than seven days.

- An accelerated course of recombinant vaccine should be offered to those given HBIG plus all sexual and household contacts (at 0, 7 and 21 days or 0, 1, 2 months with a booster at 12 months in either course)

- Avoid sexual contact, especially unprotected penetrative sex, until vaccination has been successful (anti-HBs titres >10iu/l).

Follow-up.

- Acute infection: as for hepatitis A. In view of the possibility of chronic infection, serology should be repeated after six months even if the LFT is normal.

- Chronic infection (HBeAg+ve or HBV-DNA >10^5 iu/ml): If untreated, patients should be regularly reviewed at intervals of one year or less, ideally by a physician with expertise in this disease (IV, C) [54, 68].

- Immunity after recovery from infection (surface antigen negative) is lifelong in over 90%.

Prevention

Hepatitis B testing in asymptomatic patients should be considered in men who have sex with men, sex workers (of either sex), intravenous drug users, HIV-positive patients, sexual assault victims, needle-stick victims and sexual partners of positive or high-risk patients. If non-immune, recommend vaccination (see below). If found to be chronic carriers refer for therapy.

- Vaccination should be offered to non-immune patients in most of the above groups.

- HIV positive patients show a reduced response rate to the vaccine (approximately 40%) and become anti-HBs negative more quickly

Vaccination Schedules for Hepatitis B using monovalent vaccine or combined A+B vaccine

Vaccination Schedule	Advantages	Disadvantages
0, 7, 21 days, 12 months	- Rapid immunity, - Short duration, - High antibody titres at 12 and 13 months - Potential for better uptake	- Little information on HIV or other immune-compromised patients - Low antibody titres in the first year (but current evidence suggests that protection is still adequate in the immune-competent)
0, 1, 2, 12 months	- Shorter time to early immunity than the 0, 1, 6 course - High antibody titres at 12 and 13 months	- Antibody titres lower than the 0, 1, 6 regimen in the first year
0, 1, 6 months	- Higher antibody titres at 7 months than the other two regimens although this may not be clinically important - Long established regimen - Most researched in HIV	- Poor uptake of the 6 month dose in the clinical setting

Hepatitis C virus (HCV) infection

Aetiology

An RNA virus in the flaviviridae family.

Transmission

- Parenteral spread accounts for the majority of cases through shared needles/syringes in IVDUs, transfusion of blood or blood products (pre-1990s), renal dialysis, needle-stick injury or sharing a razor with an infected individual [130-135].
- Sexual transmission occurs at a low rate (approximately 0.2-2% per year of relationship, or 1-11% of spouses in long-term relationships)
- Vertical (mother to infant) spread also occurs at a low rate (5% or less)

Clinical Features

Incubation period

Four to 20 weeks for the uncommon cases of acute hepatitis.

Symptoms

- The majority of patients (>80%) undergo asymptomatic acute infection.
- The uncommon cases of acute icteric hepatitis are similar to hepatitis A.

Signs

- Acute icteric hepatitis similar to hepatitis A.
- Chronic hepatitis similar to hepatitis B

Complications

- Acute fulminant hepatitis is rare (<1% of all hepatitis C infections)

- Approximately 50-85% of infected patients become chronic carriers - a state which is normally asymptomatic but may cause non-specific ill health. Once established, the chronic carrier state rarely resolves spontaneously (0.02%/year). Symptoms/signs are worse if there is a high alcohol intake or other liver disease.
- Mortality in acute hepatitis is very low (<1%) but 1-30% of chronic carriers will progress to severe liver disease after 14-20 years infection, with an increased risk of liver cancer (approximately 1-4% of all patients and up to 33% of those with cirrhosis). HIV co-infection worsens the prognosis.
- Pregnancy- Complications of acute icteric hepatitis: as for hepatitis A. For risk of vertical transmission see "transmission".

Diagnosis

- Antibody test (ELISA)
- HCV-RNA

Chronic infection is confirmed if an HCV-RNA assay is positive for more than six months

Management

General Advice

- Patients should be told not to donate blood, semen or organs and given advice on other routes of transmission.
- Patients should be given a detailed explanation of their condition with particular emphasis on the long-term implications for the health of themselves and their partner(s).

Treatment

Treatment should be given by a physician experienced in the management of liver disease.

Pregnancy and Breast feeding

- There is at present no known way of reducing the risk of vertical transmission.
- Breast feeding: there is no firm evidence of additional risk of transmission except, perhaps in women who are symptomatic with a high viral load.

Management of Adult Victims of Sexual Assault

These recommendations are limited to the management of victims of sexual assault within a STD clinic setting and include screening for and treatment of sexually transmitted infections (STIs) and addressing the need for psychological support. The documentation of a forensic examination and the collecting of specimens for evidential purposes is beyond the scope of these recommendations and should not be attempted by a Physician untrained in forensic medicine. The recommendations relate to female victims of sexual assault but the principles are similar in the management of male victims.

- It is exceptional that the identification of a sexually transmitted infection (STI) assumes evidential importance, as prior acquisition would have to be excluded. Indeed the presentation of positive STI findings in court may hurt rather than help a victim's case. The finding of a STI may however, influence the level of criminal injuries compensation.

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General advice

Service Availability and staffing

- Need to maintain training in communication skills amongst all staff groups
- If identified as sexual assault victim- give suitable appointment-minimum waiting
- If a patient does not wish to report, the examination should be conducted and the findings documented with the thought in mind that occasionally the doctor may be asked to produce a medical report at a later date.
- The orifices used in the assault, the timing of the assault, prior and subsequent consenting sexual intercourse, use of condoms by the assailant, and whether or not ejaculation had occurred should be documented.

History taking

- Unrushed and sensitive manner.
- Orifices involved in the assault should be clarified- many women will not disclose forced oral or anal penetration without direct questioning .
- The sexual history both before and after the assault.
- Past medical history, gynaecological, menstrual and contraceptive history.

Examination

- If the assault is recent, accurately document the injuries found on genitals (diagrams may be useful). Petechial haemorrhages on the palate should be sought with a history of forced oral penetration. Anal examination including proctoscopy should be performed if there is a recent history of forced anal penetration, noting any trauma.

A full STI screening at presentation is recommended as research suggests a significant incidence of pre-existing STI amongst women who allege rape and a smaller yet significant incidence of acquisition of STI resulting from the rape.

Initial investigations

- Cultures for *Neisseria gonorrhoea* and tests for *Chlamydia trachomatis* from any site of penetration or attempted penetration. Gram stained slides of urethral, cervical and rectal specimens. (Although *C trachomatis* culture is the only test currently accepted in court, many laboratories no longer provide culture and the sensitivity of this test is suboptimal. Nucleic acid amplification tests (NAAT) offer greater sensitivity but their medico-legal use has not been established.
- Vaginal slides for microscopy for yeasts, Bacterial Vaginosis and *Trichomonasvaginalis* (TV). Ideally, if available, culture for TV.
- Serological tests for syphilis, hepatitis B, HIV and, if indicated, hepatitis C testing should be offered, as the patient may have a pre-existing risk for infection.

Treatment

Antibiotic Prophylaxis

In situations where the patient may default requires prophylactic treatment that would cover both chlamydia and gonorrhea.

Cefuroxime axetil 1g orally stat and doxycycline 100mg orally twice daily for seven days

Pregnancy or Breastfeeding

Cefuroxime axetil 1g orally stat and erythromycin 500mg four times daily for 7 days
The efficacy of antibiotic regimes in preventing gonorrhoea or chlamydia infections after sexual assault has not been studied.
Many patients prefer prophylactic therapy to repeat examination. They should abstain from sexual intercourse until treatment has been completed.

- Hepatitis B vaccine should be offered to all victims of sexual assault, however, it is not known for how long after the assault it may still be efficacious. As Hepatitis B has a long incubation period it may be of value up to 3 weeks after the event. It can be given as an accelerated course at 0,1 and 2 months or as a 0, 1 and 6 month regime with the last dose coinciding with final serologic testing.

HIV Prophylaxis

A discussion about HIV infection should form part of the initial interview with the patient even if she/he has not raised the subject as this is often a concern. Although HIV seroconversion has followed sexual assault, the risk of HIV acquisition from heterosexual sexual assault in Sri Lanka is low. An individual risk assessment will inform any decision about the offer of PEP. This involves several factors, including the background prevalence of HIV in the area where the assault occurred, any knowledge of the risk behaviour of the assailant, stranger rape versus known assailant, presence of other STI and the type of assault (e.g. forced anal penetration, being a greater risk than penile-vaginal rape by an HIV infected assailant). If PEP is to be given then it is recommended that this should be started no later than 72 hours after a high risk exposure, the regimen being in line with the post exposure prophylaxis guidelines for occupational exposure. The patient needs to be aware of the unproven efficacy and potential toxicity of the treatment.

Pregnancy prevention

If there is risk of pregnancy, post-coital oral contraception can be issued if within 72 hours of the assault and no risk of pre-existing pregnancy.

Counselling

- Post traumatic stress disorder is common following sexual assault, however there is no evidence that brief psychological debriefing reduces this. The counsellor can discuss the patient's need for optional emotional support.
- As psychological sequelae may develop months or years later; continuity of care should be encouraged.

Sexual partners

Arrangements need to be made to see and treat the regular sexual partners of patients found to have a STI, if they may be infected. Patients and partners should abstain from sexual intercourse until treatment is completed.

Follow up

If prophylaxis was not given after the initial examination then a repeat STI screening at two weeks after the assault is advisable and should detect infections acquired at the time of the assault that were not detected on the initial examination. This is also an ideal time to review the emotional support needs of the patient. Serologic tests for syphilis, Hepatitis B and HIV should be offered (with counselling) at 12 weeks and, in high risk cases 24 weeks, as seroconversions of Hepatitis B and HIV have occasionally been documented outside the 12 week period. Although the risk from sexual assault is likely to be very low, Hepatitis C can be transmitted sexually and testing can be offered, particularly if the assailant is high risk (eg IVDU history) at 3 and 6 months.

Timing of investigations
At presentation, 2 weeks, 1 month, 3 months and 6 months of post assault

Investigations

Chlamydia
Gonorrhoea
TV/BV
Syphilis
HIV/HepB Abs
Hepatitis C antibody

Auditable Outcome Measures

- STI screen performed at initial visit — target-90%
- Offer of emergency contraception if applicable — target -90%
- Offer of emotional support made at initial visit.— target -90%

Sexually transmitted infections in children

STIs in children less than 3 years, vertical transmission is a possibility but sexual abuse has to be considered. In children above 3years sexual abuse is the most likely mode of transmission but perinatal transmission should be excluded as far as possible. In older children the possibility of sexual abuse or consensual sexual activity has to be considered.

History taking:

Care should be taken not to cause any undue psychological disturbance to the child. History should be taken either from child alone or child and parent/guardian; whichever is appropriate according to the situation. Child and the parent/guardian should be assured of confidentiality.
Clearly identify and record the reason/s for attendance:
Symptomatic – attended voluntary, brought by parents or guardian
Asymptomatic - attended voluntary, brought by parents or guardian for a checkup
Referral – OPD, hospital ward, general practitioner, court, prison, medico-legal purpose
Contact of a STD clinic attendee

Presenting complaint

Ano-genital symptoms
- vulval pain, swelling, soreness, ulcers, itching, irritation
- vaginal discharge, bleeding vulval pain, swelling, soreness, ulcers, itching, irritation
- anal pain, swelling, soreness, ulcers, itching, irritation, discharege, bleeding
- pain on defecation
- dysuria,frequency

Nature, duration, severity of symptom/s, involvement of other relevant sites, similar episodes earlier, details of any treatment taken, partner/s been symptomatic at present or past has to be recorded.
Presence of psychosomatic symptoms, emotional and behavioural disturbance indicates the possibility of child abuse.

Social history

Family background, substance abuse, possibility of prostitution, neglect, physical and emotional abuse

Sexual history

The details of sexual history that could be obtained depend on the age and mental state of the child. Attempts should be made to assess the risk of ongoing sexual abuse and physical abuse. Need to explain the older children, parents and guardians the reasons for asking sensitive questions.

In all children details of sexual exposure /s should be recorded eg; date/s and time, place/s, age and gender of the partner/s, type of sexual activity-penetrative or non penetrative, site of exposure, frequency of exposure.
In symptomatic patients, attempts should be made to get accurate details of all sexual partners during the incubation period of STIs that may be the cause of the presenting symptom/s. This facilitates effective partner notification and management.

Examination

Assure privacy
Explain the examination procedure to the child and the parent or guardian and get the consent
Carry out a thorough general physical examination
Do a complete genital examination including the perineal and peri-anal area
Take the appropriate specimens during examination

Genital examination of prepubertal and pubertal girls

Genital examination is done in the supine position.

Inspection

Vulva and anus - swelling, abrations, vesicles, warts, discharge, bleeding, ulcers, other injuries,
Labia majora should be gently separated to view the hymenal orifice. Gentle traction at the posterior edge of the labia majora between the thumb and index finger, allows clearer visualization of the hymen.

Genital examination of boys

Inspection

Shaft of the penis – any structural abnormality, swelling, rash, ulcers, warts
Prepuce – fissuring, ulcers, warts, phimosis, paraphimosis
Glans penis – oedema, ulcers, warts
Urethral meatus – warts, ulcers, discharge. If no discharge, milk the urethra and look for discharge at the meatus
Scrotum – tenderness, palpate both testes
Anal area – patulous anus, fissures, discharge, bleeding, ulcers, warty lesions
Rectum if indicated – proctoscopic examination to look for oedema, erythema of the rectal mucosa, presence of ulcers, warty lesions, pus, blood

Investigations of prepubertal and pubertal girls

Vaginal samples are taken without speculum examination
Swabs from the posterior vaginal wall or discharge for Gram stained smear (for Gram negative intra-cellular diplococci, clue cells, candida spores and hyphae) and GC culture
Swabs from the posterior vaginal wall for Chlamydia – if positive recommend confirmation
Wet smear for TV

Investigations of boys

Site/s to be sampled depend on the type of sexual exposure
Gram stained smear from urethral and rectal swabs are done if the child is symptomatic related to the site.
Urethral, oropharyngeal and rectal swabs for GC culture and Chlamydia should be taken separately depending on the site of exposure
In all children if genital ulcers present – dark ground examination
giant cells, HSV culture
serological tests for syphilis
HIV testing with consent whenever possible

In cases of sexual abuse if initial exposure is recent, a follow up visit approximately 2 weeks after the last sexual exposure will be needed to repeat the physical examination and to collect additional specimens in order to allow sufficient time for infections to incubate.

Management

- Parents should be offered full STI screening to exclude vertical transmission in children below 3 years.
- Siblings should be offered screening for STIs depending on the situation
- Where sexual abuse is suspected or disclosed in addition to STIs; pregnancy, psychological and psychosexual issues should be considered. Options for protection in the future should be explored. A comprehensive medical management could be considered involving a paediatrician, obstretician and psychiatrist.

Treatment

<table>
<tr><td>Infection</td><td colspan="4">1-12 years</td><td colspan="4">> 12years</td></tr>
<tr><td>Gonorrhoea</td><td colspan="4">Ceftriaxone 125mg intramuscularly in a single dose</td><td colspan="4">Ceftriaxone 125mg intramuscularly in a single dose. If weight is > 45Kg – treat with one of the regimens recommended for adults</td></tr>
<tr><td>Chlamydia</td><td colspan="4"><12 years
Erythromycin 50mg/kg/day in 4 divided doses orally x 14 days (maximum dose 500mg 6 hourly)</td><td colspan="4">>12 years
Doxycycline 100mg orally twice daily x7 days or
Erythromycine 500mg twice daily x 14days
or
Erythromycine 500mg 6 hourly x 7 days
or
Azithromycin 1 g orally in a single dose</td></tr>
<tr><td rowspan="2">Trichomoniasis</td><td>Child 1- <3 years</td><td>Child 3- <7 years</td><td>Child 7- <10 years</td><td>Child >10 years</td><td colspan="4" rowspan="2"></td></tr>
<tr><td>Metranidazole 50mg orally tds x 7days</td><td>Metranidazole 100mg orally bd x 7days</td><td>Metranidazole 100mg orally tds x 7days</td><td>Metranidazole 400mg orally bd x 7days</td></tr>
<tr><td>Genital Herpes</td><td colspan="4">Child < 2 years
Aciclovir 100mg orally 5 times a day x5days</td><td colspan="4">Child > 2 years
Aciclovir 200mg orally 5 times a day x5days</td></tr>
<tr><td>Anogenital warts</td><td colspan="8">Observation period for minimum of 3 months unless symptoms of pain, bleeding or irritation. If so consider - cryotherapy, electrosurgery or surgical excision under general anaesthesia.
If the child is > 2yrs podophyllatoxin ,or imiquimod can be used</td></tr>
</table>

Emergency Contraception

Emergency contraception (EC) or emergency postcoital contraception, refers to contraceptive measures taken after sex to prevent pregnancy.

Forms of EC include:

- Emergency contraceptive pills (ECPs) - act both to prevent ovulation or fertilization and possibly post-fertilization implantation of the blastocyst.
- Intrauterine devices (IUDs) - acts by preventing implantation of the zygote.

ECPs are generally recommended for backup or "emergency" use, rather than as the primary means of contraception. They are intended for use when other means of contraception have failed - for example, if a woman has forgotten to take a oral contraceptive pill or when a condom is damaged during sex.

Emergency contraceptive pills (ECPs) – (Levonogestrol 750 µg)

Emergency contraceptive pills are taken after unprotected sexual intercourse to prevent pregnancy. It is effective if taken within 72 hours of unprotected sexual intercourse and taking ECP as soon as possible increases the efficacy. It may also be used between 72 and 120 hours after the unprotected sexual intercourse but efficacy decreases with time. The progestin-only regimen (using levonorgestrel) is reported by the US FDA to have 89% effectiveness and the combined (Yuzpe) preparation to be 74%.

Types of ECPs:

The progestin-only method uses the progestin, levonorgestrel in a dose of 1.5 mg, preferably as a single dose or two 750 µg doses, 12 hours apart. If a woman vomits within 2 hours of taking a levonorgestrel-only ECP, she should take a further dose as soon as possible.

The combined or Yuzpe regimen uses large doses of both estrogen and progestin, taken as two doses at a 12 hour interval. It is possible to obtain the same dosage of hormones, and therefore the same effect, by taking 4 regular combined oral contraceptive pills as a single dose within 72 hours of unprotected sexual intercourse followed by another 4 OCP twelve hours later.

Side effects

The most common side effects reported were nausea and vomiting. But anti-emitics are not routinely recommended with levonorgestrel-only ECPs.
Other common side effects - fatigue, headache, dizziness, and breast tenderness. Side effects usually do not occur for more than a few days after treatment, and they generally resolve within 24 hours.

When prescribing ECPs, the Medical Officer should explain that:

1. The next menstruation may be early or late
2. A barrier method of contraception needs to be used until the next menstruation
3. The need to seek medical support promptly, if any lower abdominal pain occurs because this could signify an ectopic pregnancy.
4. The need to return promptly if she does not get her next menstrual period or if menstruation is abnormally light, heavy or short.
5. The importance of the routine STI screening
6. The importance of practising a regular contraceptive method

Counselling for STIs and HIV

Counselling is an important component in comprehensive management of patients with STIs. Main aim of counselling is further prevention of STIs and HIV. Counselling helps the patient to assess their risk behaviours and take informed decisions regarding future protection.Counsellor should maintain privacy, assure confidentiality, have empathy and non judgemental attitudes towards the client.

Counselling for STIs

Issues to be addressed in counselling a patient with STIs

- Nature of the STI, importance of complying with treatment and follow up
- Learning about, and coming to terms with, worrisome complications of STIs, such as infertility and congenital syphilis
- Dealing with recurring conditions like herpes genitalis , genital warts which may be transmitted to the partner(s) or spouse
- Importance of partner notification and disclosure related issues (options: either the patient or the health care provider inform the partner/s or spouse)
- Confidentiality, disclosure and the risk of violence or stigmatizing reactions from spouse, partner(s), family or friends and ways to overcome
- Assessing the patient's risk for HIV and assisting patient's decision on HIV testing
- Helping the patient to practice responsible behavior in order to prevent acquisition of STIs in the future. Promote condom use.

Pre test counselling for voluntary confidential testing for HIV

Assure confidentiality

This is an important responsibility of all STD care providers and is essential for establishing and maintaining client's trust. Confidentiality should be assured for all information shared between the STD care provider and client. Personal and medical information may be disclosed to another health care provider ***only when it is necessary*** for further management of the client . Even in such situations only those who are directly involved in client's care will be informed .

Steps in carrying out pre test counselling

- Check client's knowledge on HIV/AIDS and the HIV test
- Depending on client's knowledge explain the client what is HIV infection , the difference between HIV infection and AIDS
- Explain the ways which HIV can be transmitted and how STIs can facilitate HIV transmission.
- Explain how HIV is not transmitted.
- Discuss the details of client's sexual exposure/s, other risky behaviours and when did they happen?
- Work with the client to get a self assessment of risk of acquiring HIV.

- Discuss safe sex and risk reduction in future and promote condom use
- Check whether the client is in the window period and explain what is meant by window period and implication of the window period on HIV test results
- Explain the importance and benefits of HIV testing
- Address barriers for testing
- Assess the ability to cope up with a positive result and support available
- Explain procedure of HIV testing and possible results - positive, negative, indeterminate
- Explain available services, support and referral system
- Obtain **informed consent** for HIV testing

Informed Consent

Once accurate and adequate information on HIV/AIDS and testing procedure is provided client will make an informed decision about accepting or declining the test. If the client decline the test t the decision should be respected and leave the option open for testing in future.

Post-test counselling

Steps in carrying out post test counselling

- Cross-check test results against client's number to ensure that the correct result is provided.
- Provide results to the client in person.
- Check whether client is in a suitable state to get the result, particularly the positive result
- Give the test results in a neutral tone of voice and wait for the client to respond before proceeding.

Negative results

- Explain that a negative result means there is no evidence of HIV infection
- However check for possible exposure in the window period, one that was undisclosed in pretest counselling or that may have occurred since then. If so provide with a date for retesting.
- Some clients who have engaged in high-risk behaviour without becoming infected may think they are immune . Explain that this negativity is not life long and they could become positive if they continue to practice risk behaviors.
- Reinforce information on HIV transmission, prevention strategies and personal risk reduction measures.
- Review and explore any constraints on practicing safe sex and support them.

Positive result

- Explain that a positive result means the client is infected with HIV.
- Reinforce confidentiality

- Give the client time to absorb the information before proceeding. Make sure that the client understood the test results and absorbed the information.
- Assess the client's ability to cope with the diagnosis and check the support available to the client immediately
- If possible discuss the value of disclosing to the partner or family.
- Provide brief information on available HIV treatment and care services and advice on healthy living and responsible sexual behavior to prevent further transmission. Most clients will be too distressed for a detailed discussion and will not be able to absorb information at this point.
- Provide information on support services available and link the client with other HIV-positive individuals for support if they wish
- Check whether the client has any questions
- Ensure client's safety in travelling home.
- Make arrangements for follow-up counselling sessions to assist the client in adapting to the diagnosis as soon as possible.
- Provide information on how to contact you if the client need

Follow up counseling

During follow up conselling sessions following important aspects have to be discussed as early as possible.

- Details of HIV care and treatment
- Diet, health, rest, exercise
- Disclosure to partner, family
- Partner testing
- Responsible sexual behavior, safe sex and condom use
- Family planning and contraception in women
- Testing children when indicated
- Infection control at home and in other social gatherings

Laboratory diagnosis of sexually transmitted infections

Laboratory Diagnosis of Syphilis

Tests for syphilis:

- Direct microscopic examination to demonstrate *Treponema pallidum*
- Non-treponemal serological tests, used for screening
- Treponemal serological tests used for confirmation

No cultural methods are available. T. pallidum subsp. pallidum cannot be cultivated in artificial media or on tissue culture, and cannot be easily stained.

Demonstration of TP

Darkfield microscopy

This method is used when lesions are present.
Darkûeld microscopy is used to demonstrate *Treponema pallidum* in material from lesions or lymph nodes. The demonstration of *T. pallidum* indicates a deûnitive diagnosis of syphilis

Characteristic morphology and motility of *Treponema pallidum:*

- spiral shape, length 6-15µ, breadth 0.15µ
- characteristic movements- rotatory, angular flexion, back-and-forth
  Since *T. pal-lidum* is identiûed by characteristic morphology and motility, the preparation must be fresh.

False negative results in dark field microscopy are seen when lesions are old, when anti treponemal treatment has been given or when the sample has not been collected properly. Sensitivity of darkfield microscopy reaches 80% when performed correctly.

Dark-field microscopy should NOT be used for the examination of samples from oral lesions as it is difficult to differentiate *T. pallidum* from *saprophytic spirochetes* in the mouth.

Collection of specimen for DG microscopy:

- clean the ulcer surface with saline and remove any crusts, if present
- Squeeze the base of the ulcer between the thumb and index fingers
- Wipe away the first few drops of fluid, especially if blood stained
- Collect the sample of serous exudate by pressing a clean cover slip on to the lesion
- Place the cover slip on a clean slide
- Examine immediately under the dark-field microscope
  (if the lesion is not accessible, serous exudate may be aspirated from the lesion using a sterile syringe/ pipette)

In the case of secondary syphilis or early congenital syphilis, specimens may be collected from condylomata lata or mucous patches.

Serological Tests

Non-specific non-treponemal antibody tests:

These tests are moderately speciûc for syphilis (false-positives occur), but highly sensitive.

The two commonly used tests are:
VDRL- Venereal Disease Research Laboratory
RPR – Rapid Plasma Reagin

The VDRL test is performed either as a qualitative test used for screening or, as a quantitative test used to detect disease activity and response to therapy.
A 4-fold rise in the titer is suggestive of a new infection, re-infection or relapse in sero-fast persons.

Specific treponemal antibody tests:

These treponemal tests measure antibody speciûc for *T. pallidum*. They are highly speciûc and highly sensitive.

Tese tests are used to

- conûrm a positive VDRL/ RPR test (to identify false-positive diagnoses)
- diagnose late syphilis when reagin tests may be nonreactive.

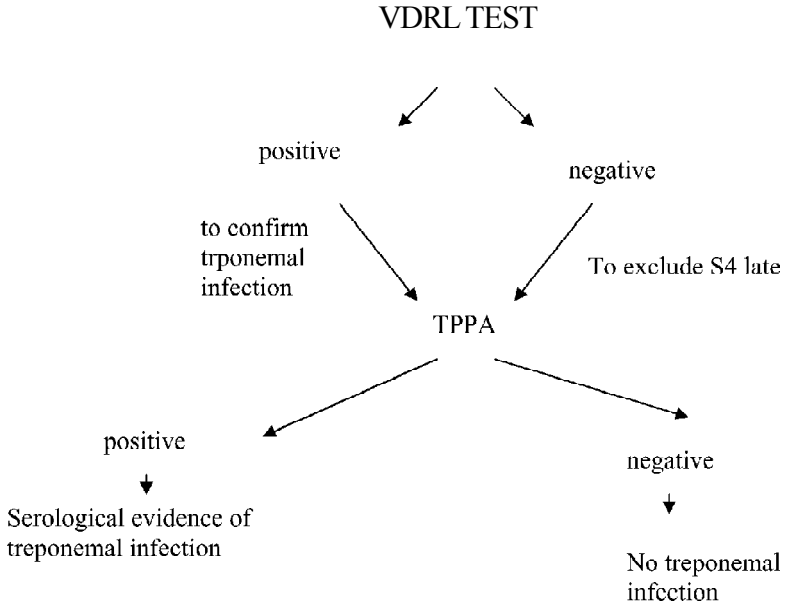
Commonly used tests are:

TPHA	-	T.pallidum haem- agglutination test
TPPA	-	T.pallidum particle - agglutination test
ELISA	-	Enzyme Linked Immuno-sorbent Assay

It has been shown that 1%of general population will have false positive treponemal tests. However iftwo trponemal tests are reactive, the sample is most likely (95%) from a person who has or has had syphilis.

THE FINAL DECISION SHOULD REST WITH CLINICAL JUDGEMENT.

Protocol for serological tests for syphilis



Biological False Positive (BFP) reaction

In the absence of any clinical symptoms or a history of treponemal infection, a positive nontreponemal result but a negative specific test result is known as a biological false positive (BFP) reaction. The titre of the nonspecific test is usually low, rarely more than 1:8.

Biologically false positive results may occur due to damage to host tissue by infection, immunization or auto immune disease.

Acute BFP reactions usually occur in:

- Acute infections
- After vaccination
- In pregnancy and
- In frequent blood transfusions

A chronic BFP reaction lasting more than 6 months may occur in many instances including :

- Auto immune disease
  - Lupus erythematosis
  - Haemolytic anemia
  - Rheumatoid arthritis
- Drug Addicts
- Aging
- Cancer
- Tuberculosis
- Leprosy

NEUROSYPHILIS:

Antibody tests in serum
- VDRL may or may not be positive
- TPHA / TPPA positive

Antibody tests in CSF
- CSF VDRL test should be performed only when patient's serum treponemal test is positive
- VDRL test is positive in 30-70% and is almost 100%- specific. A positive CSF VDRL test is nearly always proof of neurosyphilis in the ***absence of visible contamination of CSF*** by peripheral blood.
- TPHA - is sensitive, but not specific. A positive TPPA alone is not diagnostic of neurosyphilis because transudation of IgG through the blood – brain barrier cannot be excluded. However it has been shown that TPPA titre of >1:640 and TPHA titre of >1:320 could be considered diagnostic

CONGENITAL SYPHILIS:

Both VDRL and TPPA tests can be positive due to the placental transfer of maternal IgG even in the absence of fetal infection. However the presence of anti treponemal IgM in the blood of the new-born, indicates active treponemal infection.
A negative IgM test should be repeated at 4, 8 and 12 weeks after birth since IgM response might be delayed or suppressed.

Anti treponemal IgM in serum is thought to disappear from the circulation within 9 months after adequate treatment.

HIV COINFECTION IN SYPHILIS

- Generally tests are performed in the same way as in immunocompetent patients
- Test results can be unpredictable
- False negative tests and delayed appearance of sero-reactivity have been reported
- In secondary syphilis positive test results may be delayed
- Like in many chronic infections biological false positive reactions may be seen in non- specific tests
- Positive reactions may be missed due to prozone phenomenon

Laboratory Diagnosis of Gonococcal Infection

The definitive diagnosis is established by the identification of *N. gonorrhoeae* at an infected site.

Collection of Specimens

Appropriate sites for specimen collection depend on the sex, age and sexual practices of the individual as well as the clinical manifestations of the infection.

women: The primary collection site in women is the endocervical canal. The secondary sites include the urethra, rectum and oropharynx.

heterosexual men: In heterosexual men, material should be collected from the urethra.

homosexual men: The primary sites in homosexual men are the urethra, rectum and oropharynx.

Sterile cotton swabs should be used for specimen collection.
Endocervix – The use of antiseptics, analgesics and lubricants should be avoided
when collecting specimens. Use a vaginal speculum, which may be moistened with water. After inserting the speculum, clean the ecto-ocervix with a large cotton swab. Insert the sterile cotton swab about 2cm into the cervical canal. Rotate and move the swab gently from side to side for 5-10 seconds to allow absorption of the exudate.

Urethra – If discharge is evident collect directly on to a swab. If not, milk the urethra to evacuate exudate. Still if no discharge collect urethral specimens 4 hours after the patient has passed urine , by inserting a thin swab 2-3 cm in to the urethra and gently rotating the swab for 5-10 seconds to allow absorption of the exudates.
.

Rectum – In symptomatic patients rectal specimens should be obtained under direct vision following insertion of a proctoscope. If asymptomatic samples may be obtained by blindly inserting a cotton swab 3cm into the anal canal and rotate it for 10 seconds to collect exudates from the crypts just inside the anal ring. Use lateral pressure to avoid fecal contamination. If faecal contamination occurs, discard the swab and use another to obtain the specimen.

Vagina – Vaginal specimens are recommended for prepubertal girls. Discharge can be collected with a swab **without** the use of a speculum.

For women who have had a hysterectomy - urethral swab for culture offers a better yield than high vaginal culture.

Oropharynx – Swab the region of the tonsillar crypts and the posterior pharynx.

Before inoculating on to the culture medium, a smear for microscopy should be made. To obtain a thin homogenous film, roll the swab on to a clean slide, and allow the smear to air dry. Carefully roll the swab on the slide to avoid disrupting cells as rubbing may destroy cellular morphology. Smear should cover only a small area of the slide.

The highest yield of gonococci is obtained when specimens are inoculated directly on to a culture medium in the examination room. Roll the swab containing the specimen over a small area of the surface of the culture plate. When rolling the swab, care should be taken not to dig into the medium. Inoculated plate should be sent to the laboratory immediately for further streaking and incubation.

Transport of Specimens

If culture facilities are not available, the swabs should be inserted into a transport medium (Amies) and transported at room temperature, to reach the laboratory within 24-48 hours.

Microscopy

Sensitivity and specificity of a gram stained smear of urethral discharge from a symptomatic male are 95% and 97%, respectively. Therefore a Gram stain of a male urethral specimen that shows polymorphonuclear leucocytes with intracellular gram negative diplococci can be considered diagnostic in ***symptomatic men***.

In females, however, Gram stained smears of cervical secretions detect only 40-60% of culture positive specimens.

In asymptomatic patients of both sexes, the sensitivity of Gram stained smear is extremely low and it should therefore not be considered as a diagnostic test.

Direct microscopic examination is not recommended for rectal and pharyngeal smears.

Culture

Culture offers a reliable, sensitive (>95%) and relatively cheap diagnostic test that also allows antimicrobial sensitivity testing. Selective culture media such as Thayer Martin (TM), modified Thayer Martin (MTM) and New York City(NYC) containing antimicrobials are often used for routine isolation of gonococci.

A presumptive identification of colonies can be made by a Gram stain and an oxidase test. It is necessary to confirm the identification with carbohydrate degradation tests. Culture confirmed by carbohydrate degradation tests is considered the gold standard for the diagnosis of infection with *N. gonorrhoeae* in genital as well as non genital sites.

NUCLEIC ACID AMPLIFICATION TESTS (NAAT)

Several types of NAAT are available for the detection of *N. gonorrhoeae*. These include poly-merase chain reaction (PCR), ligase chain reaction (LCR).
Key general points regarding these tests are as follows:

- NAAT exhibit equal or slightly greater sensitivities for detection of *N. gonorrhoeae* than that of culture, and all have excellent speciûcity as well (e"99.6%).
- NAAT can be performed on traditional swab specimens collected from the urethra and cervix.
- Most importantly, NAAT can be performed on urine. It is important that first catch urine (FCU) be collected. Midstream urine should not be used.
- None of the NAAT are approved for use on rectal or pharyngeal detection of *N. gonorrhoeae*
- Since there is no culture isolate from NAAT determination of antibiotic susceptibility is not possible

Tests for Chlamydia infection need to be done if available, as co-infection with Chlamydia is common.

Laboratory Diagnosis of *Chlamydia trachomatis* (CT)

Specimen Collection

Viable chlamydial organisms are found within urethral, cervical, and rectal epithelial cells, but not in exudate or pus. Thus, a specimen containing purulent discharge is not adequate. The type of swab used for specimen collection is critical to the success of chlamydia detection, so use only a swab provided or recommended by the laboratory. *Do not use eekel shafted swabs.*

The following techniques provide optimum specimen collection.

Cervical swab:

- Clean the cervical os to remove debris and secretions.
- Insert the sterile cotton swab about 2cm into the cervical canal.
- Rotate and move the swab gently from side to side for 15-30 seconds to obtain an adequate number of cells.
- Remove swab, taking care not to contaminate it with material from the vaginal walls and place in transport medium
  Urethral swab may be used in women who have undergone hysterectomy.

Note: If specimens are obtained for other tests (eg. gonorrhea), they should be taken before the swab for chlamydia test.

Urethral swab in men:

- Insert a swab 2 to 3 cm into the urethra and rotate, making sure the swab is in contact with the urethral wall to obtain an adequate number of cells.
- Remove the swab and place it in transport medium.

Laboratory tests to diagnose Chlamydia:

- Antigen detection by ELISA
- Culture
- Direct Immunofluorescence
- NAAT

} presently not available in Sri Lanka

Antigen detection by ELISA:

Advantages of this method include ease of transport and rapid results. Endocervical, urethral, or conjunctival specimens are collected on swabs provided by the manufacturer and are held in the refrigerator (4-8℃) until sent to the laboratory. Collection techniques are the same as for culture
These tests have a relatively good sensitivity and speciûcity in high-risk populations, but less satisfactory results have been found in low-risk popula-tions.

Direct Immunofluorescence:

Several kits are available for the rapid detection of chlamydial elementary bodies in urethral, cervi-cal, conjunctival, and rectal smears directly stained with speciûc ûuorescein-labeled antibody (FA). Specimen

collection techniques are the same as those described for culture, except that the specimen swab is smeared onto the glass slide provided by the test kit manufacturer, allowed to dry, ûxed in methanol, and sent to the laboratory.
Low sensitivity of the test has been reported in low risk populations when the number of elementary bodies may be very small, but the test is relatively sensitive and quite speciûc in high-risk populations.

Nucleic acid amplification tests (NAAT):

Several types of NAAT are available for the detection of *C. trachomatis.* These include polymerase chain reaction (PCR), ligase chain reaction (LCR)

- All exhibit considerably greater sensitivities for detection of *C. trachomatis* than that of EIA, or DFA-based tests, and to a lesser extent, greater sensitiv-ity than that of culture. All have excellent speciûcity as well (e"99.6%).
- All can be performed on traditional swab specimens collected from the urethra and cervix.
- Most importantly, all can be performed on urine. It is important that first catch urine (FCU) be collected. Midstream urine should not be used.
- None of the NAAT are approved for use on rectal or pharyngeal detection of *C. trachomatis.*

Laboratory diagnosis of Herpes simplex virus

Culture:

Specimen collection

The stage of the lesion and the quality of the specimen collected signiûcantly affect culture sensi-tivity. Sensitivity decreases with increasing lesion age. Thus, herpes simplex virus (HSV) is recovered most frequently from vesicular lesions and infrequently from crusted lesions. Primary lesions are also more likely to yield virus than are recurrent lesions.
Note: When collecting the specimen, emphasis is on collection of cells from the base of the le-sion

Sensitivity of culture according to stage of lesion:

Vesicle	90% +
Pustule	80-90%
Ulcer (< 5 days)	60-75 %
Ulcer (> 5 days)	50%
Crust	20-30%

Vesicular or pustular lesion:

1. Unroof the vesicle with an 18-gauge needle..
2. Using a moistened swab, abrade the base of the lesion in order to obtain a good sample of cells.
3. Immediately place the swab in viral transport media.

Crusted lesion

1. Remove the crust
2. Scrape the base of the lesion with a moistened swab. Avoid making the lesions bleed
3. Immediately place the swab in viral transport media

Specimen Transport:

The specimen should be refrigerated until transported to the laboratory.
When transporting:

- Deliver to the lab on wet ice or a coldpak within 72 hours.
- When delivery to the lab is delayed >72 hours, maintain the specimen on dry ice or at -70°C. (Normal freezer temperature of -20°C will not preserve the virus.)

Tzanck smear

This method is used to demonstrate cellular changes caused by the herpes group of viruses . Infection by the herpes group of virus can be rapidly and reliably diagnosed by a Tzanck smear. It may, however, be impossible to distinguish between these conditions based on cytodiagnostic features. Ideally, a vesicle less than 3 days old should be selected for the smear since older lesions may get crusted or secondarily infected and the characteristic cytomorphology may no longer be present.
Tzanck smear is a very simple and rapid technique. Samples should be taken from a fresh vesicle, rather than a crusted one, to ensure the yield of a number of virus infected cells. The vesicle should be unroofed or the crust removed, and the base gently scraped with a swab. The material thus obtained is smeared onto a microscopic slide, allowed to air dry, and stained with Giemsa stain. The slide should be clean, since cells will not adhere to an unclean slide. The stained nuclei may vary in color from reddish blue to purple to pink. The cytoplasm stains bluish.
The typical features include characteristic multinucleated syncytial giant cells. The cells appear as if they have been inflated ("ballooning degeneration"). Syncytial giant cells contain multiple nuclei (many with 8 or more) that exhibit nuclear molding, so that the nuclei fit together in a jigsaw puzzle like fashion. The nuclei show great variation in shape and size. Intra nuclear inclusion bodies surrounded by subtle clear halo are characteristic of herpetic infection, but are often difficult to find.

Direct Immunofluorescent:

This method is used to demonstrate viral antigen in a direct smear made from an external genital lesion.
Collect cells from the base of the lesion as described above, roll the swab on the slide provided by the manufacturer, add ûxative, and send to the laboratory.
Sensitivity of the test varies with the age of the lesion and the number of cells collected. This test should not be used for detecting viral shedding from the cervix.

Serological Tests;

Enzyme immunoassay (EIA)

Accurate type specific HSV serologic assays are based on the HSV specific glycoprotein G2 (for HSV 2) and glycoprotein G1 (for HSV 1).

Type specific HSV serologic assays might be useful in the following scenarios:

- Symptomatic Patients - serologic tests on paired samples alone (acute- and convalescent sera drawn 3 to 4 months later) is a reasonable backup test when viral detection is not available.
- Asymptomatic Patients -the most significant potential application of serology is to detect silent carriers of HSV-2, especially in high-risk settings such as STD clinics
- Patients at risk of HIV Infection
- Pregnant women
- Discordant couples

DIAGNOSIS OF CHANCROID CULTURE

Isolation of *Hemophilus ducreyi* from a genital lesion or lymph node provides a deûnite diagnosis of chancroid. However, it is difficult to isolate the organism and culture of *H. ducreyi* may not be of-fered by all laboratories.
Request media from the laboratory in advance so the specimen can be plated immediately after collection. Gonococcal agar base supplemented with bovine hemoglobin, fetal calf serum and vanco-mycin is recommended.

Specimen collection

1. Clean the lesion thoroughly with sterile saline.
2. Then moisten a cotton-tipped swab with saline and swab the lesion.
3. Press and roll the swab on the agar plate and immediately deliver to the laboratory.

DIRECT GRAM STAIN

Gram stain of a lymph node aspirate may be helpful in making the diagnosis of chancroid when tiny, chaining Gram-negative rods are seen. Gram stain of a lesion is generally not recommended because of the frequent polymicrobial nature of these lesions.

DIAGNOSIS OF LYMPHOGRANULOMA VENEREUM (LGV) SEROLOGICAL TESTS

Lymph node aspirate may be sent for chlamydia culture. Isolation of the LGV immunotypes (Ll, L2, or L3) is diagnostic.

CULTURE

Serological testing, by microimmunoûuorescence (MIF) or the more widely available LGV complement ûxation test, is used to establish the diagnosis of LGV. A fourfold rise in titer by comple-ment ûxation indicates active infection, while a single titer of 1:64 or greater supported by clinical ûnding suggests infection. Speciûc antibody to the LGV immunotypes of *Chlamydia trachomatis* can be demonstrated by MIF.

DIAGNOSIS OF GRANULOMA INGUINALE (GI) (Donovanosis) SMEAR

A touch prep of a lesion biopsy or tissue smear stained with Giemsa or Wright's stain is used to demonstrate infection with *Klebsiella granulomatis*. Large mononuclear cells with charac-teristic intracytoplasmic Donovan bodies are diagnostic.

Trichomoniasis is usually diag-nosed by visualization of motile trichomonads on saline microscopy of vaginal ûuid. This method has an estimated sensitivity of 60% relative to culture.

- Saline microscopy should be performed immediately on fresh specimens of vaginal ûuid from anterior and posterior fornices to enhance the likelihood of detection. Even with appropriate performance, sensitivity of this test generally does not exceed 60% to 65%.

Direct microscopy is performed on wet mount using light microscope, phase contrast or dark field. A dried smear stained with Giemsa or acridine orange or fluorescent staining could be used.

- Culture for *T. vaginalis* can be performed using various media, the most widely available being the InPouch system which is inoculated with the swab used to collect the specimen. This system can be used to culture the urethra in men and women as well as vaginal ûuid.

- PCR is available for T. vaginalis, and can be applied to vaginal, urethral, or urine specimens.

- Antigen detection assays for T. vaginalis are under evaluation.

DETECTION OF TRICHOMONAS VAGINALIS

Signs and symptoms are predictive but insufficient to establish diagnosis

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PREPARATION OF SALINE WET PREP

Use either of the following two methods of preparation:

Method I	Method II
1. Place approximately 0.5 ml of normal saline (i.e.0.85 %) in a small test tube. The saline must be at room temperature or warmer. 2. Collect vaginal material on a swab by rubbing the swab against the vaginal walls, and emulsify in the saline to make a heavy suspension. 3. Leave the swab in the tube and go to the microscope *within 15 minutes.* 4. Place a drop of specimen on a slide and cover with a cover-slip. Be careful not to trap air bubbles under the cover-slip. 5. Read the slide immediately. 6. Save the test tube suspension for repeat wet preps or Gram stain if necessary.	1. Place a large drop of saline on a microscope slide. 2. Collect the vaginal specimen on a swab as described in Method I, and emulsify in the drop of saline on the slide to make it turbid. 3. Carefully add a cover-slip without trapping air bubbles. 4. Read the slide immediately.

PREPARATION OF KOH SLIDE

1 Collect the vaginal specimen on a swab, then roll the swab on a small area of the slide.
2 Add a large drop of 10% KOH (potassium hydroxide) and mix with a wooden applicator or swab.
3 Sniff for a "ûshy" odor.
4 Cover with a cover-slip; avoid trapping air bubbles.
5 Read the slide as soon as possible.

MICROSCOPIC EXAMINATION

1. Saline prep: read before KOH. Examine under low power (10X) to focus and detect rapidly moving trichomonads or large pseudohyphae. Then examine on high power (40X) to evaluate the presence or absence of PMNs, "clue" cells, trichomonads, yeast buds, or pseudohyphae.

2. KOH prep: Scan for pseudohyphae on low power. Conûrm presence of pseudohyphae and locate yeast buds on high dry.