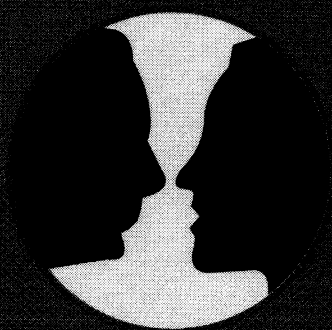


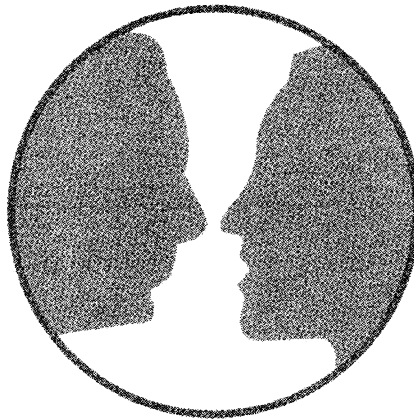
MALAYSIAN GUIDELINES
in the treatment of
SEXUALLY TRANSMITTED INFECTIONS



THIRD EDITION
2008



MALAYSIAN GUIDELINES
in the treatment of
SEXUALLY TRANSMITTED INFECTIONS



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FOREWORD

I would like to congratulate the participating doctors for producing the third edition of the Malaysian Guidelines in the Treatment of Sexually Transmitted Infections. I believe the Guideline will be of tremendous use to all health care workers involved in the management of patients with Sexually Transmitted Infections (STIs), especially those serving at health centres and polyclinics.

If left untreated, STIs may lead to severe physical and psychosocial morbidity and even mortality. More importantly, such infections have been shown to enhance the transmission and / or acquisition of HIV infection. With the recent rise of STIs, especially genital herpes, this may lead to an increase in the number of patients infected with HIV. Early diagnosis and prompt and effective treatment of STIs are therefore of paramount importance in the prevention of further morbidity and related complications.

The main aim of this Guideline is to make available to all practicing doctors in Malaysia a concise and current reference for the best possible treatment options of STIs. However, it must be emphasized that management of STIs also includes early diagnosis, an awareness of the possibility of coexistent infections, effective management procedures including the location and treatment of contacts and patient education, all of which play a crucial role in limiting transmission of these infections.

The prevention and control of sexually transmitted infections is an issue of national importance, which warrants a collaborative effort from all sectors contributing to health care and these include, amongst others, the Ministry of Health, the Ministry of Education and the Ministry of Women, Family and Community Development.

Finally, I would like to wish the authors of this Guideline every success in furthering the health of the Malaysian community and providing them with a better quality of life. I am confident that all readers and users of this Guideline will find it most useful and invaluable.

Thank you.



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FOREWORD

I wish to take this opportunity to congratulate the committee members of this Guideline for taking the initiative to review the Malaysian Guidelines in the Management of Sexually Transmitted Infections (STIs). It is timely that the previous guidelines be reviewed to meet the current challenges of managing STIs in Malaysia today.

The control of STIs is critical to the global improvement of the reproductive health of all people. The serious impact of STIs on women and children in particular, and the linkage between STIs and HIV prevention are of profound concern to public health professionals worldwide. Better STI prevention and control programmes mean that there should be improvements in reproductive health, including HIV prevention.

It is my sincere wish that the publication of this Guideline would be valuable to all stakeholders in particular, public health physicians, family physicians, dermatologists, general practitioners, nurses, medical assistants and health planners. The publication of this Guideline is indeed timely.

I hope that this Guideline would be a source of reference not only to the medical community in this country, but also around the region. Inevitably, this will lead to gains in STI and HIV prevention and care, and ultimately contribute to a high-level of reproductive healthcare for women, men and children.

Thank you and best wishes,



DATO' DR. HASAN BIN ABDUL RAHMAN, MPH
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FOREWORD

Guidelines are important documents that facilitate consistency and quality in a health professional's daily practice. For it to be continuously relevant and to keep up with new knowledge, it must be regularly updated.

It is for this reason that the STI Guidelines for Malaysia has been revised for the third time. The working committee has worked hard and diligently to produce this third edition, under the able chairmanship of Dr. H. B. Gangaram of the Department of Dermatology, Hospital Kuala Lumpur.

I would like to thank the members of this working committee for their efforts and contributions, without whom this document would not be a success. Our appreciation also goes to the Ministry of Health for their total support in this endeavour. It is my hope that this Guideline will be used wisely by health professionals for the benefit of patients.



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The authors would like to thank Dr. Baskaran T.P., consultant obstetrician and gynaecologist, Dr. Joseph Alagaratnam, consultant ophthalmologist from Hospital Kuala Lumpur for reviewing the topics on pelvic inflammatory disease and ophthalmia neonatarum respectively. We would like to record our sincere thanks to Puan Sri Datuk Dr. Suraiya H Hussein for her invaluable advice on this Guideline, the AIDS/STD Division, Ministry of Health, Malaysia for funding this project and the Dermatological Society of Malaysia for their support.

PREFACE

Since the second edition was published in 1997, there have been many changes, some minor some major in the management of STIs. This is unavoidable as medicine is advancing rapidly and the specialty of genitourinary medicine has similarly progressed. I am fortunate to have a highly experienced and multi-talented team to help me in revising this guideline.

Accurate diagnosis and effective treatment are of utmost importance in managing patients with sexually transmitted infections (STIs). This will help to not only prevent spread to the partners but also prevent any physical, social and/or psychological sequelae and more importantly in preventing HIV transmission and acquisition. Counseling and education is an essential package of this management to effect behavior modification (from “risky” to “safe”) and to prevent the spread of STI in the community.

Successful case management of STIs requires careful history taking, a thorough physical examination, appropriate investigations and early and effective treatment at the first encounter. In history taking, being non judgemental, sympathetic and ensuring confidentiality is of immense importance in order to gain confidence of the anxious patient.

To reach the larger target population in the rural areas where facilities are inadequate, syndromic management of STIs has been shown to provide an acceptable alternative mode of STI care. We have adopted and adapted the syndromic approach to STI management as recommended by the WHO in this Guideline. The use of new and rapid diagnostic tests in the clinic may help to support the syndromic management of STIs where the high-cost laboratories and skilled personnel are not accessible.

The laboratories will play an increasingly important role in the management of STIs, especially with the availability of new and rapid diagnostic tests (e.g. rapid treponemal tests for syphilis) as well as the rapidly changing antimicrobial sensitivity of *Neisseria gonorrhoeae* and the other STI microorganisms. Increasing antimicrobial resistance has led to problems in the treatment of gonorrhoea, and the regimens recommended have changed. Regional reference laboratories may need to be set up to provide support for both the laboratory-based and syndromic management of STIs in order to provide quality care for all the patients.

In view of recent world-wide increase in early infectious and congenital syphilis, it is important that we re-familiarise ourselves with the features of this disease and the

serious consequences of missing this diagnosis and other concurrent STIs such as HIV. Routine antenatal clinic testing for syphilis has to be consolidated and rigidly reinforced. Increasing number of early syphilis is also seen in both heterosexual men and men who have sex with men (MSM).

Viral STIs such as genital herpes and genital warts have also shown a steady rise in recent years in Malaysia. In the absence of a cure, genital herpes may cause much morbidity, both physical and psychological. The role of the *human papilloma virus* (HPV) in cervical intraepithelial neoplasia is well established. With the introduction of the HPV vaccines, Quadrivalent vaccine (Gardasil, MSD) in October 2006 and the Bivalent vaccine (Cervarix, GSK) in December 2007 in Malaysia, it is hoped that the burden of HPV infection will be reduced.

HIV infection may affect the clinical course of the older sexually transmitted infections. Understanding such interactions is important as diagnosis may be missed with disastrous consequences.

Finally, I would like to thank all who have in one way or another helped in making this Guideline a success. We hope this Guideline in STI management will be useful to all doctors practicing in and outside of Malaysia.

GANGARAM HEMANDAS BELANI, FRCP

Chairman

2008

THE EPIDEMIOLOGY AND CHALLENGES OF STIs

Epidemiology

Sexually transmitted infections (STIs) are among the most common cause of illness in the world and have far reaching health, social and economic consequences. In addition to their sheer magnitude, STIs are a major public health problem for two additional reasons; their serious sequelae and the fact that they facilitate transmission of Human Immunodeficiency Virus (HIV).

The World Health Organisation (WHO) estimated that the global incidence of STIs in 2006 was more than 300 million cases. Nearly a million people acquire STIs, including HIV, every day. The consequences of these infections include acute symptoms, chronic infection, and serious delayed consequences such as infertility, ectopic pregnancy, cervical cancer and the untimely deaths of infants and adults. The presence in a person of other STIs such as syphilis, chancroid ulcers or genital herpes simplex virus infection greatly increases the risk of acquiring or transmitting HIV. New research suggests an especially potent interaction between very early HIV infection and other STIs. This interaction could account for 40% or more of HIV transmission.

Prevention and control of STIs should be an integral part of comprehensive sexual and reproductive health services in order to contribute towards the attainment of the Millennium Development Goals (MDG) and respond to the call for improved sexual and reproductive health. This strategy deals with methods to promote healthy sexual behaviour, protective barrier methods, effective and accessible care for STIs, and to upgrade the monitoring and evaluation of STI control programmes.

More than 30 bacterial, viral and parasitic pathogens are transmissible sexually. While STIs are mostly transmitted through sexual intercourse, transmission can also occur from mother to child during pregnancy and childbirth, through blood products or tissue transfer, as well as occasionally through other non-sexual means.

Given the social, demographic and migratory trends, the population at risk for STIs will continue to grow dramatically. The burden from STIs is greatest in the developing world, but industrialised nations can also be expected to experience an increased burden of the disease because of the prevalence of non-curable viral STIs, trends in sexual behaviour and increased travel. Care for the sequelae of STIs accounts for a large proportion of tertiary health-care costs in terms of screening and treatment of cervical cancer, management of liver disease, investigation of infertility, care for perinatal

morbidity, childhood blindness, pulmonary disease in children and chronic pelvic pain in women. The social cost of STIs would include conflict between sexual partners and domestic violence. The costs escalate further when the cofactor effect of other STIs on HIV transmission is taken into consideration.

In Malaysia, the exact size of the problem is unknown which is partly due to underreporting, underdiagnosis, and asymptomatic manifestation of the disease. The reported incidence rate of syphilis decreased from 7.68 per 100,000 population in 2000 to 6.03 in 2001 to 3.44 in 2005 and 2.76 in 2006. Gonorrhoea also recorded a decreasing trend from 5.74 per 100,000 population in the year 2000 to 2.06 and 1.64 in 2005 and 2006 respectively. However, recent data from individual Genitourinary Medicine Clinics in Malaysia showed an increasing trend of STIs especially early syphilis, herpes genitalis and genital warts.

Even though the trend of reported notifiable STIs in Malaysia is decreasing, the incidence of sexually transmitted HIV infection especially amongst women is on the rise.

Challenges of STI control

STI control depends on a synergistic relationship between numerous elements which, when combined with improved clinical case management, hold out the promise of a highly effective approach.

1. Behaviour change, a key to STI prevention, is the end result of health messages that have been absorbed by community members through mass media and interpersonal strategies.
2. Condom promotion requires good quality and affordable condoms.
3. The syndromic approach to STI management is pragmatic in that it does not require laboratory facilities, and patients are treated when they come in and are therefore, not lost to follow-up.
4. Effective, available and affordable drugs are a major condition for successful STI management.
5. Partner management is not implemented fully because of the social stigma.
6. Screening asymptomatic individuals, especially women, is limited by the unavailability of inexpensive, accurate and rapid diagnostic tests.
7. Special efforts should be made towards core and marginalized groups who are disproportionately infected with STIs.
8. Good STI management involves a clear delineation of staff responsibilities and ongoing staff training as well as coordination with related programmes.

9. Laboratories play an essential role in epidemiological and microbiological surveys.
10. Surveillance, monitoring and evaluation are the basis for sustaining STI case management programmes and keeping it relevant and effective.
11. Research in epidemiological, behavioural and operations are needed for planning and revising STI case management programmes.

GENERAL SCREENING

Sexually transmitted infections are recognized worldwide as important causes of morbidity in both maternal and child health. They also pose a major threat to reproductive health.

Sexually transmitted bacterial infections can be cured by accurate diagnosis and prompt and effective treatment rendering the patient non-infectious. Complications and further transmission can be prevented by contact tracing and effective therapy of infected contacts.

Currently available therapy for sexually transmitted viral diseases does not ensure a cure and exerts a much less, if any, effect on transmission. All the viruses remain latent for long periods. Sexually transmitted viral infections usually follow a clinical course of remissions and relapses, and therapy does not always render the patient non-infectious. Asymptomatic infected persons can be infectious to their partners. Education, counseling and positive behavioural change are the main ways to prevent transmission of sexually transmitted viral infections, including human immunodeficiency viral (HIV) infection.

This Guideline is issued with the hope that at least the sexually transmitted bacterial infections are managed effectively and every opportunity is taken to educate and counsel patients in order to promote a lifestyle devoid of careless sexual activity and condom usage if the lifestyle is not adhered to. Prevention and control of STIs is of utmost importance in this HIV era since it is well-known that the presence of a STI, whether ulcerative or non-ulcerative, may enhance both the acquisition and transmission of HIV.

GENERAL GUIDELINES

All patients requesting evaluation of STI should undergo the following as part of their routine health care:

- History
- Medical & behavioural risk assessment
- Laboratory investigations
- Diagnosis
- Curative or palliative therapy

- Counseling & education
- Management of present episode of STI
- Prevention of future episodes
- Reporting of a case*
- Sex partner identification, notification and evaluation
- Clinical follow-up where appropriate

* Only Syphilis, Chancroid, Gonorrhoea & HIV infections are notifiable in Malaysia to date.

ROUTINE LABORATORY TESTS

1. All patients are subjected to the following screening tests:

- a. Blood tests
 - i. HIV antibody test
 - ii. Syphilis serology (both VDRL/RPR & TPHA or TPPA)
 - iii. HBs Ag
 - iv. Anti HCV Ab
- b. Dark-field microscopy for *T. pallidum* and HSV antigen detection for all genital ulcers
- c. Lumbar puncture is indicated
 - i. If neurosyphilis is suspected
 - ii. For late latent syphilis and syphilis of unknown duration only in HIV-infected patients
 - iii. For ocular syphilis

2. Male patients

- a. Urethral swabs
 - i. Gram stain for pus cells and intracellular Gram-negative diplococci
 - ii. Culture for *N. gonorrhoeae*
 - iii. Antigen / NAAT test for *C. trachomatis*

- iv. HSV antigen detection
 - v. Wet mount for *T. vaginalis*
 - b. Sub-preputial swab
 - i. Gram stain for Candida yeast
- 3. Female patients
 - a. Endocervical swabs
 - i. Gram stain for pus cells, intracellular Gram-negative diplococci
 - ii. Culture for *N. gonorrhoeae*
 - iii. Antigen / NAAT test for *C. trachomatis*
 - iv. HSV antigen detection
 - v. Pap smear
 - b. Vaginal swabs
 - i. Wet mount from posterior fornix for *Trichomonas vaginalis*
 - ii. Gram stain for pus cells, yeasts and clue cells
 - iii. Candida culture - swab from lateral fornix

SYPHILIS

AETIOLOGY

Treponema pallidum

EARLY SYPHILIS

Early syphilis is defined as infection during the first 2 years and includes primary, secondary and early latent syphilis.

PRIMARY SYPHILIS

INCUBATION PERIOD: 9-90 days

PRESENTATION / FINDINGS

Primary syphilis presents classically as a solitary, non-tender, indurated and well-circumscribed ulcer (chancre) with regional lymphadenopathy. The chancre is commonly located in the anogenital region. However, chancres may be multiple, painful, purulent and extragenital (most frequently oral). It may present as syphilitic balanitis of Follman.

Any anogenital ulcer should be considered to be due to syphilis unless proven otherwise.

INVESTIGATIONS

- Dark-field microscopy for *T. pallidum* from ulcer
- Direct immunofluorescent test (DFAT) for *T. pallidum*
- PCR for *T. pallidum*
- Non-specific serology with reaginic tests (VDRL / RPR) - if negative, repeat at week, 1 month & 3 months
- Specific treponemal tests (TPHA / TPPA) are less sensitive than reaginic tests in early primary syphilis
- The syphilis EIA is reported to be more sensitive than other specific treponemal tests in early syphilis
- Rapid treponemal tests (mostly line chromatography or particle agglutination tests with results available within 5-20 min.) validated by the W.H.O. are recommended for patients who are unlikely to return for follow-up.

SECONDARY SYPHILIS

INCUBATION PERIOD: 6 weeks-6 months

PRESENTATION / FINDINGS

The commonest presentation is a generalised non-irritating skin lesion involving the palms and soles with or without generalised lymphadenopathy. Condylomata lata, mucocutaneous lesions and patchy alopecia are seen less commonly. The rash is classically non-itchy but may be itchy, particularly in dark-skinned patients.

Secondary syphilis is a stage of bacteraemia and hence, patients can present with symptoms and/ or signs referable to any system in the body for example anterior uveitis, meningitis, cranial nerve palsies, hepatitis, splenomegaly, periosteitis and glomerulonephritis.

INVESTIGATIONS

- All serological tests for syphilis are expected to be positive in secondary syphilis
- RPR/ VDRL titres in untreated cases are often > 1:8 (VDRL) and > 1: 16 (RPR)
- If a reaginic test (RPR/ VDRL) is used for diagnosis, confirm a positive result with a specific treponemal test (TPHA / TPPA / EIA / Rapid treponemal tests)
- If a specific treponemal test is used for diagnosis and is found to be positive, use the VDRL/ RPR test to determine disease activity, and to monitor response to therapy
- Dark-field microscopy / DFAT from mucocutaneous lesions

EARLY LATENT SYPHILIS

Latent Syphilis in the first 2 years of infection diagnosed by a **POSITIVE SEROLOGY** without symptoms and signs in:

- A person known to be sero-negative in the previous 2 years
- A contact of known early syphilis
- Retrospectively, in a patient whose sero-negativity is achieved within 6 months of treatment

TREATMENT

Treatment of Early Syphilis (Primary, Secondary and Early Latent Syphilis)

Recommended

- Procaine penicillin G, 600,000 to 1.2 mega units I.M. daily for 10 days or
- Benzathine penicillin, 2.4 mega units I.M. 1 week apart for 2 consecutive weeks

Alternative

These may be required for those with penicillin allergy or refusing parenteral treatment.

- Doxycycline 100 mg b.d. P.O. for 14 days or
- Azithromycin 2 g single dose P.O. or
- Erythromycin 500 mg q.i.d. P.O. for 14 days or
- Erythromycin ethyl succinate 800 mg q.i.d. P.O. x 14 days or
- Ceftriaxone 500 mg I.M. daily for 10 days (if no anaphylaxis to penicillin)

ADVICE

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

CONTACT TRACING

Examine and investigate all sex partners and treat epidemiologically. 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.

All patients should be offered patient and provider referral as a method of contacting any sexual partner. The method agreed upon with the patient should be clearly documented. Epidemiological treatment for asymptomatic contacts of early syphilis is recommended.

INCUBATING SYPHILIS / EPIDEMIOLOGICAL TREATMENT

Recommended

- Benzathine penicillin 2.4 MU I.M. single dose

Alternative

- Doxycycline 100 mg b.d. P.O. for 14 days or
- Azithromycin 1 g single dose P.O.

FOLLOW-UP

Patients should be reexamined with serological (VDRL or RPR) follow-up at months 1, 2, 3, 6 and 12, then 6 monthly until VDRL/ RPR negative or sero-fast at low titre (RPR 1:8 or less).

LATE SYPHILIS

Late syphilis is defined as syphilis occurring 2 years after infection and includes late latent syphilis, benign tertiary syphilis (Gumma), cardiovascular syphilis and neurosyphilis.

LATE LATENT SYPHILIS

Syphilis of more than 2 years duration, diagnosed by positive serology without any symptoms and signs. All patients should have a thorough clinical examination.

INVESTIGATIONS

- Chest X-ray
- Lumbar puncture for
 - HIV patients with late syphilis or syphilis of unknown duration
 - All those with neurological or ophthalmic signs or symptoms
 - CSF should be sent for biochemical analysis, WBC count and VDRL test

Patients with neurological symptoms or signs should be referred to a neurologist for a thorough neurological examination to rule out other causes or for further management.

GUMMA (BENIGN TERTIARY SYPHILIS)

INCUBATION PERIOD: 3-12 years

PRESENTATION / FINDINGS

Gumma is a destructive granulomatous lesion, commonly presenting with skin or bone lesions. Liver, heart, brain, stomach and the respiratory tract may be affected.

Treponemes can be demonstrated in the tissues by silver impregnation staining or PCR.

CARDIOVASCULAR SYPHILIS

INCUBATION PERIOD: 15–30 years

PRESENTATION / FINDINGS

Although syphilis may affect any large vessel, it is characterized by an aortitis affecting the proximal aorta. The aortitis may cause aortic incompetence (which may be complicated by heart failure), coronary ostial stenosis (presenting as angina), and aortic medial necrosis causing aortic aneurysm.

TREATMENT OF LATE LATENT SYPHILIS, GUMMA OR CARDIOVASCULAR SYPHILIS

Recommended

- Benzathine penicillin 2.4 MU I.M. weekly for three weeks (three doses)
or
- Procaine penicillin 600 mg (600,000 units) I.M. daily for 17 days

Alternative

- Doxycycline 100 mg b.d. P.O. for 28 days or
- Tetracycline 500 mg q.i.d. P.O. for 28 days

CONTACT TRACING

Examine and investigate sex partner. Treat if indicated.

FOLLOW-UP

Examine clinically and serologically at 6 monthly intervals for 2 years and thereafter annually till seronegative or stable at a low titre (VDRL/RPR 1:4 or less).

NEUROSYPHILIS

Central nervous system disease may occur during any stage of syphilis. Clinical evidence of neurological involvement warrants CSF examination. Late neurosyphilis includes meningovascular and parenchymatous syphilis.

INVESTIGATIONS

- CSF protein concentration, cell count, VDRL test, *T. pallidum* PCR
- The CSF VDRL test has a low (< 50%) sensitivity but high specificity (with no documented false positives)
- Serum specific treponemal tests should be positive in neurosyphilis

MENINGOVASCULAR SYPHILIS

INCUBATION PERIOD: 5 to 10 years

PRESENTATION / FINDINGS

Headache, vertigo and cranial nerve involvement.

PARENCHYMATOUS NEUROSYPHILIS

INCUBATION PERIOD: 10-20 years

PRESENTATION / FINDINGS

Patients may present with general paresis of the insane (brain syndrome) characterized by gradual personality change, ataxia, stroke or ophthalmic symptoms or with tabes dorsalis (spinal cord syndrome) presenting with lightning pain, sensory impairment and mobility problems. Both syndromes are important differential diagnosis in dementia, psychiatric disorders and mobility problems.

TREATMENT

Recommended

- Aqueous crystalline penicillin G, 12 - 24 mega units per day, administered 2 - 4 mega units every 4hourly I.V. for 17 days or
- Procaine penicillin, 2.4 mega units I.M. daily and Probenecid, 500 mg q.i.d. P.O. for 17 days

Alternative

- Doxycycline 200 mg b.d. P.O. for 28 days or
- Ceftriaxone 2 g I.M. (with Lidocaine as diluent) or I.V. (with water for injection as diluent NOT Lidocaine) for 10-14 days (if no anaphylaxis to penicillin)

CONTACT TRACING

Examine and investigate sex partners. Treat if indicated.

FOLLOW-UP

- Lumbar puncture 6 monthly till CSF cell count is normal
- VDRL / RPR yearly for life

SYPHILIS IN PREGNANCY

Antenatal screening for syphilis with non-treponemal tests (VDRL/ RPR) should be routinely performed on first visit and at 28 weeks of gestation. Positive results must be confirmed with treponemal tests (TPHA/ TPPA/ EIA /Rapid tests).

Rapid treponemal test, if available, can be used for screening antenatal mothers. RPR/ VDRL have to be performed on all patients with positive rapid treponemal tests to determine disease activity and to monitor response to therapy.

TREATMENT

Penicillin regimen appropriate for the woman's stage of syphilis is recommended.

Doxycycline and tetracycline are contraindicated in pregnancy. Erythromycin should not be used because of the high risk of failure to cure the foetus. If erythromycin is used, paediatricians must be alerted and babies have to be treated prophylactically with penicillin and monitored.

Pregnant women with a history of penicillin allergy should be meticulously interviewed regarding the validity of the history. Skin testing and desensitization can be done if necessary. Women who are treated in the second half of pregnancy are at risk of premature labour and/ or fetal distress if their treatment precipitates a Jarisch-Herxheimer reaction.

They should be advised to seek medical attention if they notice any change in foetal movements or have any increased contractions following treatment.

FOLLOW-UP

Monthly clinical and serological examination till delivery and thereafter follow-up is as in non-pregnant patients.

CONGENITAL SYPHILIS

Infants should be evaluated if they were born to sero-positive women who:

- Have untreated syphilis
- Were treated for syphilis less than 1 month before delivery
- Were treated for syphilis during pregnancy with a non - penicillin regimen
- Did not have the expected decrease in VDRL / RPR titre after treatment
- Were treated but had insufficient serologic follow-up during pregnancy to assess disease activity

EVALUATION OF FETUS

- A thorough physical examination
- Dark-field or DFA examination of suspicious lesions
- *T. pallidum* PCR on body fluids
- Serum quantitative RPR/ VDRL test (to be compared with mother's titre)
- CSF analysis for cells, protein and VDRL (in infants with highly probable disease)
- X-ray of long bones (and other clinical investigations where indicated)

THERAPY DECISIONS

Regardless of the evaluation results, all infants should be treated at birth if they are born to women who:

- Have untreated syphilis
- Were treated for syphilis less than 1 month before delivery
- Were treated for syphilis during pregnancy with a non - penicillin regimen
- Did not have the expected decrease in VDRL titre after treatment
- Were treated but had insufficient serologic follow-up during pregnancy to assess disease activity

In addition, infants should be treated if they have:

- Any physical findings consistent with congenital syphilis
- A reactive CSF-VDRL
- An abnormal CSF finding (WBC > 5/ mm³ or protein > 50 mg / dl*) regardless of CSF serology, in the absence of another possible cause
- Serum VDRL / RPR titre at birth that is at least 4 times higher than their mother's titre**
- Positive EIA-IgM antibody**

- * Normal CSF values differ by gestational age and are higher in preterm infants
- ** Negative serology at birth does not exclude congenital syphilis; false negatives can occur when the mother's titre is low or the mother has late latent syphilis

TREATMENT OF CONGENITAL SYPHILIS

- Aqueous crystalline penicillin G, 100,000 - 150,000 units/kg daily (administered as 50,000 units/kg I.V. 8-12 hourly) for 10 days or
- Procaine penicillin, 50,000 units/ kg daily I.M. for 10 days

Infants who should be evaluated but whose follow-up cannot be assured should be treated with a single dose of Benzathine penicillin, 50,000 units/ kg I.M.

FOLLOW-UP

Sero-positive untreated infants must be closely monitored at 1, 2, 3, 6, and 12 months of age. VDRL should decrease by 3 months of age and usually disappear by 6 months of age.

Treat if :

- VDRL / RPR titre increases fourfold or more by 3 months of age
- VDRL / RPR still positive by 6 months of age
- TPHA still positive by 1 year of age

Treated infants must be monitored clinically and serologically at 1, 3, 6, 12, 18, and 24 months. Lumbar puncture should be repeated 6 monthly till normal.

THERAPY OF OLDER INFANTS AND CHILDREN

After the newborn period, children discovered to have syphilis should have a CSF analysis to rule out congenital syphilis. Any child with congenital syphilis or with neurologic involvement should be treated with Aqueous crystalline penicillin, 200,000-300,000 units/kg/day administered as 50,000 units/kg 4-6 hourly for 10 to 14 days.

SYPHILIS IN HIV - INFECTED PATIENTS

Neurosyphilis should be considered in the differential diagnosis of neurologic disease in HIV-infected persons. When clinical findings suggest that syphilis is present but serologic tests are negative or confusing, alternative tests such as biopsy of lesions or dark-field examination should be used. Treatment is the same as for non-HIV infected patients but HIV patients with syphilis should be reevaluated clinically and serologically at 3, 6, 9, 12 and 24 months after therapy to detect any treatment failure.

TREATMENT FAILURE

Treated patients should be considered for retreatment if:

- Clinical symptoms or signs persist or recur as a result of inadequate treatment
- An initially high VDRL / RPR (1:16 or more) fails to decrease fourfold by 1 year
- There is a sustained fourfold rise in VDRL / RPR titre

JARISCH - HERXHEIMER REACTION (JHR)

An acute febrile illness with headache, myalgia, chills and rigors and resolving within 24 hours.

This is common in early syphilis but is usually not important unless there is neurological or ophthalmic involvement or in pregnancy when 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 (coronary ostia, larynx, nervous system). Prednisolone can reduce the reaction.

Treatment

In early syphilis

Treat with Paracetamol

In Neurosyphilis,
Cardiovascular,
certain cases of
benign tertiary
and late latent syphilis

Treat with Prednisolone 10 mg t.d.s.
for 3 days: Begin 24 hours before
treatment and for 2 days after starting

PROCAINE REACTION

This is due to an inadvertent intravenous injection of procaine penicillin. It is characterised by fear of impending death and may cause hallucinations or fits immediately after injection and lasting less than 20 minutes. Calm and verbal reassurance is required and restraint may be necessary. If fits occur, give Diazepam 10 mg rectally.

- Anaphylactic shock: Facilities for treatment of anaphylaxis should be available as penicillin is amongst the commonest cause.
 - Epinephrine (Adrenaline) 1:1000 I.M. 0.5 ml followed if necessary by I.M./I.V. antihistamine e.g. chlorpheniramine 10mg and I.M./I.V. hydrocortisone 100 mg
- Allergy: Penicillin desensitisation may be considered for patients with penicillin allergy.

MANAGEMENT OF PATIENTS WITH HISTORY OF PENICILLIN ALLERGY

Currently, no proven alternative therapies to penicillin are available for treating neurosyphilis, congenital syphilis or syphilis in pregnancy. Therefore, skin testing, with desensitisation, if indicated, should be done for these patients.

Desensitisation should be done in a hospital setting because serious IgE-mediated allergic reactions may occur. The following protocol is recommended. Oral penicillin in increasing concentration is administered every 15 minutes. Sensitisation is completed within 4 hours with a cumulative dose of 1.3 million units of penicillin V.

ORAL DESENSITISATION PROTOCOL

Dose	Penicillin V Suspension (units/ml)	Amount		Cumulative dose (units)
		ml	units	
1	1000	0.1	100	100
2	1000	0.2	200	300
3	1000	0.4	400	700
4	1000	0.8	800	1500
5	1000	1.6	1600	3100
6	1000	3.2	3200	6300
7	1000	6.4	6400	12700
8	10000	1.2	12000	24700
9	10000	2.4	24000	48700
10	10000	4.8	48000	96700
11	80000	1.0	80000	176700
12	80000	2.0	160000	336700
13	80000	4.0	320000	656700
14	80000	8.0	640000	1269700

LABORATORY DIAGNOSIS OF SYPHILIS

Demonstration of *Treponema pallidum* from lesions or infected lymph nodes

1. Dark-ground / Dark-field microscopy

- Should be performed by an experienced laboratory technician or doctor
- If the initial test is negative, repeat daily for three days

2. Polymerase Chain Reaction (PCR)

- Due to limited availability and the time taken to obtain a result, this is not a replacement for dark-field microscopy in the clinic setting.
- In certain circumstances, PCR may be helpful in diagnosis by demonstrating *T. pallidum* in tissue samples, vitreous fluid and CSF.

3. Direct Fluorescent Antibody Test (DFAT)

SEROLOGICAL TESTS

Recommended screening

- Both non-treponemal (VDRL / RPR) and treponemal tests should be routinely performed for
 - All GU medicine clinic attendees
- Antenatal screening with non-treponemal tests (VDRL/ RPR) should be routinely performed
 - on first visit and at 28 weeks of gestation
 - confirm positive results with treponemal tests (TPHA/TPPA)
- EIA (both IgG and IgM) is ideal screening test for blood bank/transfusion services since it is automated and specific.
 - A quantitative VDRL / RPR should be performed for positive tests to classify/stage the disease, determine the need for and monitoring of treatment
 - A VDRL / RPR titre of >1:16 and/or a positive IgM test indicate active disease and the need for treatment, although serology must be interpreted in the light of the treatment history and clinical findings
- Rapid treponemal tests (Rapid tests)

GONORRHOEA

AETIOLOGY

Neisseria gonorrhoeae

INCUBATION PERIOD: 2-5 days

PRESENTATION / FINDINGS

Men

- Urethral discharge (>80%) and dysuria (>50%)
- Anal discharge (12%) or perianal pain (7%)
- Testicular swelling and pain
- Fever, petechial or pustular skin lesions, asymmetrical arthralgia, septic arthritis, tenosynovitis, and very rarely, meningitis or endocarditis, caused by disseminated gonococcal infection (DGI)
- Asymptomatic infection can occur: urethral < 10%, rectum > 85%, pharynx > 90%

Women

- Altered vaginal discharge, mucopurulent endocervical discharge or contact bleeding, caused by cervicitis
- Lower abdominal pain and tenderness, caused by pelvic inflammatory disease (PID)
- Fever, petechial or pustular skin lesions, asymmetrical arthralgia, septic arthritis, tenosynovitis, and very rarely, meningitis or endocarditis, caused by disseminated gonococcal infection (DGI)
- Asymptomatic infection is common: endocervix > 50%, rectum > 85%, pharynx > 90%
- Transluminal spread of *N. gonorrhoeae* may occur from the urethra or endocervix to involve the epididymis and prostate in men and the endometrium and pelvic organs in women respectively
- Haematogenous dissemination may also occur from infected mucous membranes, resulting in skin lesions, arthralgia, arthritis and tenosynovitis. Disseminated gonococcal infection is uncommon (<1%)
- Right hypochondrium pain due to perihepatitis (Fitz-Hugh-Curtis syndrome) is a rare but recognized complication

INVESTIGATIONS

Gram stain of urethral, cervical or rectal exudates

- Gram-negative intracellular diplococci in leucocytes (Gram stain is not appropriate for pharyngeal specimens)

Culture on modified Thayer Martin culture medium performed on all samples

- offers a high sensitivity, confirmation of diagnosis, and antibiotic sensitivity testing

Nucleic acid amplification tests (NAATs) and nucleic acid hybridization tests

- more sensitive than culture
- can be used as diagnostic / screening tests on non-invasively collected specimens (urine and self-taken vaginal swabs)
- caution is required in interpretation of positive results as specificity of NAATs is not 100%

TREATMENT

Recommended

Uncomplicated anogenital infection in adults:

- Ceftriaxone 250 mg I.M. as a single dose or
- Cefixime 400 mg single dose P.O.

Alternative

May be used when an infection is known to be sensitive to these antimicrobials or when the regional prevalence of resistance to them is less than 5%:

- Cefotaxime 500 mg I.M. as a single dose or
- Spectinomycin 2 g I.M. as a single dose

Penicillin and tetracyclines are no longer recommended for treatment of gonorrhoea owing to high resistance rates to these antibiotics, worldwide. High dose azithromycin

(2 g as a single dose) has shown acceptable efficacy in clinical trials, but is associated with a high gastrointestinal intolerance. The emergence of azithromycin resistant *N. gonorrhoeae* has been reported and clinical efficacy does not always correlate with in-vitro sensitivity testing. Azithromycin is not a recommended treatment for gonorrhoea.

Clinicians using alternative regimens are recommended to regularly review local sensitivity data with their microbiology colleagues.

B-LACTAM ALLERGY

Recommended

- Spectinomycin 2 g I.M. as a single dose

PREGNANCY AND BREASTFEEDING

Pregnant women should not be treated with quinolone or tetracycline antimicrobials.

Recommended

- Ceftriaxone 250 mg I.M. as a single dose or
- Spectinomycin 2 g I.M. as a single dose

PHARYNGEAL INFECTION

Recommended

- Ceftriaxone 250 mg I.M. as a single dose
- Single dose treatment using ampicillin or spectinomycin has a poor efficacy in eradicating gonococcal infection of the pharynx

DISSEMINATED GONOCOCCAL INFECTION (DGI)

Recommended management is based on expert opinion and accumulated clinical experience.

Hospitalize patient and treat with:

- Ceftriaxone 1 g I.M. or I.V. every 24 hours or
- Cefotaxime 1 g I.V. every 8 hours or
- Spectinomycin 2 g I.M. every 12 hours

Therapy should continue for at least 7 days.

CO-INFECTION WITH *CHLAMYDIA TRACHOMATIS*

Up to 20% of men and 40% of women with gonorrhoea have co-infection with *C. trachomatis*.

Screening for *C. trachomatis* should routinely be performed on adults with gonorrhoea or treatment given to eradicate possible co-infection.

Combining effective antimicrobial therapy against *C. trachomatis* with a single dose therapy for gonococcal infection is particularly appropriate when there is doubt that a patient will return for follow-up evaluation.

ADVICE

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

CONTACT TRACING

- Male patients with symptomatic urethral infection should notify all partners with whom they had sexual contact within the preceding 2 weeks.
- Patients with infection at other sites or asymptomatic infection should notify all partners within the preceding 3 months.
- Sexual partners should be treated for gonorrhoea preferably after evaluation for sexually acquired infection.

FOLLOW-UP

Patients should be assessed after treatment:

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

CHLAMYDIA TRACHOMATIS GENITAL TRACT INFECTION

- *Chlamydia trachomatis* is the commonest bacterial STI and the prevalence is highest in persons aged ≤ 25 years.
- Asymptomatic infection is common among both men and women.

AETIOLOGY

Chlamydia trachomatis serovars D to K

INCUBATION PERIOD: 7-21 days

PRESENTATION / FINDINGS

In women

- Asymptomatic (60-70%)
- Muco-purulent discharge (30-40%)
- Hypertrophic ectopy (oedematous, congested cervix which bleeds easily, especially post-coital bleeds 20%)
- Lower abdominal pain
- Dysuria
- Acute and chronic symptoms and signs of Pelvic Inflammatory Disease

In men

- Asymptomatic (50-60%)
- Urethral discharge, particularly in young men 16-30 years of age
- Post-gonococcal urethritis
- Dysuria
- Signs of epididymitis and prostatitis
- Rectal symptoms in MSM
- Pharyngeal infections in MSM

In both gender

- Conjunctivitis
- Ano-rectal discomfort
- Arthralgia

INVESTIGATIONS**Specimens for testing**

In men: urethral smear and or first void urine
 In women: endocervical smear and or first void urine

Laboratory tests**Gram stain**

- Increased PMNs (average of ≥ 5 per high power field in urethral smear and ≥ 20 per high power field in endocervical smear)
- To exclude Gram-negative intracellular diplococci

Cell culture

- Cell culture is highly specific but has a sensitivity of 40-80%

Direct Fluorescent Antibody Test (DFAT) for chlamydial antigen**Enzyme Immunoassays (EIA)**

- Sensitivity of 20-75%. EIA's are being replaced by NAAT's.

Nucleic acid amplification tests (NAAT's)

- These tests are highly sensitive and specific and are suitable for non-invasive samples such as urine and low vaginal swabs.
- Multiplex PCR assays are available for the simultaneous detection of chlamydia and gonorrhoea.

The table below shows the relative sensitivities of different laboratory tests for the diagnosis of chlamydial infections in females by specimen type:

	Cervix	Urine	Vulva
Culture	50-70%	5-20%	20-30%
DFA	45-55%	NA	NA
EIA	40-50%	NA	25-40%
NAAT	85-93%	80-90%	80-90%

* NA: not available

TREATMENT

Uncomplicated urethral, endocervical, or rectal chlamydial infections :

Recommended

- Doxycycline 100 mg b.d. P.O. for 7 days or
- Azithromycin 1 g single dose P.O.

Alternative

- Ofloxacin 300 mg b.d. P.O. for 7 days or
- Erythromycin 500 mg q.i.d. P.O. for 7 days or
- Erythromycin ethyl succinate 800 mg q.i.d. P.O. for 7 days

For Pregnant Women

- Erythromycin 500 mg q.i.d. P.O. for 7 days
- Erythromycin ethyl succinate 800 mg q.i.d. P.O. for 7 days

Chlamydial Infections among Infants

- Prenatal screening of pregnant women may prevent chlamydial infection among neonates.
- Pregnant women aged <25 years are at high risk for infection.
- *C. trachomatis* infection of neonates results from perinatal exposure to the mother's infected cervix.
- Initial *C. trachomatis* perinatal infection involves the mucous membranes of the eye, oropharynx, urogenital tract, and rectum and may be asymptomatic in these locations.
- *C. trachomatis* infection in neonates is most frequently manifested as conjunctivitis that develops 5-12 days after birth.
- *C. trachomatis* may cause a subacute, afebrile pneumonia with onset at 1-3 months of age.

CONTACT TRACING

- Sexual partners of patients with chlamydial infection within the past 30 days must be tested and if positive must be treated likewise.
- If testing is not available, or if the partners are unwilling for examination, they must be treated epidemiologically
- If there are neonates in the family, they should also be screened.
- Patient-delivered partner therapy is not routinely recommended for MSM because of a high risk for coexisting infections, especially undiagnosed HIV infection, in their partners.
- Evidence is building that expedited partner therapy (EPT) may be just as effective as or more effective than standard partner referral and epidemiological treatment.

ADVICE

Patients should be instructed to abstain from sexual intercourse until they and their sex partner/s have completed treatment.

NON-SPECIFIC GENITAL INFECTION (NSGI)

AETIOLOGY

Urethral discharge may be due to sexually transmitted infections caused by nearly 30 diverse pathogens that include bacteria, viruses, protozoa, fungi and ectoparasites. In the past, infections with urethral discharge showing an increased number of PMN's but no intracellular Gram-negative diplococci, were called non-gonococcal urethritis (NGU) or post-gonococcal urethritis (PGU) respectively. Mucopurulent cervicitis is the female equivalent. These infections have been found to be caused by:

- *C. trachomatis* 30-50%
- *Mycoplasma genitalium* 15-20%
- *Ureaplasma urealyticum* 5-10%
- *Trichomonas vaginalis* 1-10%
- Other etiologies implicated in non-gonococcal, non-chlamydial urethritis (NGNCU) are candidal infection, genital warts, foreign bodies, and infection by enteric bacteria following insertive anal sex.

PRESENTATION / FINDINGS

- Dysuria
- Urethral discharge
- Meatitis
- Penile irritation
- Frequency of micturition
- Asymptomatic
- The discharge in men may be muco-purulent or mucoid, and in some patients, is only observed on milking the urethra.

Other clinical signs include balanitis, balanoposthitis, epididymo-orchitis, SARA or Reiter's syndrome.

INVESTIGATIONS

Gram stain of urethral or endocervical smear

- Increased PMNs (average of ≥ 5 per high power field in urethral smear and ≥ 20 per high power field in endocervical smear)
- To exclude Gram-negative intracellular diplococci

2 glass-urine test (for male patients only)

- Pass the first 20 ml of urine into the first glass and the rest into the second glass; add 5% acetic acid to dissolve any sulphate or phosphate crystals
- Haziness in the first glass only is indicative of anterior urethritis
- Haziness in both glasses is indicative of infection throughout the urinary tract

Urethral /endocervical smear for gonococcal and chlamydial culture

Urine NAAT for Chlamydia and Mycoplasma

Culture or PCR for HSV if any ulcers seen

Microscopy and culture for *T. vaginalis*

NB: For men who have sex with men (MSM)

- Culture for *N. gonorrhoeae* from urethra, oro-pharynx and rectum
- NAAT on urethral discharge and urine for *C. trachomatis* and *N. gonorrhoeae* and *Mycoplasma genitalium*

TREATMENT

Recommended

- Azithromycin 1 g single dose P.O. or
- Doxycycline 100 mg b.d. P.O. for 7 days

Alternative

- Erythromycin base 500 mg q.i.d. P.O. for 7 days or
- Erythromycin ethyl succinate 800 mg q.i.d. P.O. for 7 days or
- Ofloxacin 300 mg b.d. P.O. for 7 days or
- Levofloxacin 500 mg o.d. P.O. for 7 days

CONTACT TRACING

Persons with NSGI should refer for evaluation and treatment all sex partners within the preceding 60 days.

ADVICE

- Patients should be advised to return for evaluation if symptoms persist or recur after completion of therapy.
- Patients should be advised to abstain from sexual intercourse until 7 days after therapy is initiated, provided their symptoms have resolved and their sex partners have been adequately treated.
- Persistence of pain, discomfort, and dysuria of more than 3 months should alert the clinician to the possibility of chronic prostatitis/chronic pelvic pain syndrome in men.

PERSISTENT URETHRITIS IN MALE PATIENTS

- Retreat with the initial regimen if they did not comply with the initial treatment or if they were reexposed to an untreated sex partner or a new partner
- Otherwise, a wet mount for *T. vaginalis* should be performed using an intraurethral swab or a first-void urine specimen
- In some patients, it may be due to tetracycline-resistant *U. urealyticum*

TREATMENT

- Metronidazole 2 g single dose P.O. or Tinidazole 2 g single dose P.O.
PLUS
- Azithromycin 1 g single dose P.O. (if not used for initial episode)

NON - SPECIFIC CERVICITIS

- Cervicitis is frequently asymptomatic
- Two major diagnostic symptoms/signs characterize cervicitis:
 - Purulent or mucopurulent endocervical exudate
 - Contact bleeding

TREATMENT

- Azithromycin 1 g single dose P.O. or
- Doxycycline 100 mg b.d. P.O. for 7 days

Treat for trichomoniasis if indicated

HIV INFECTION

- Patients who have cervicitis and are HIV infection positive 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.

PELVIC INFLAMMATORY DISEASE (PID)

AETIOLOGY

Pelvic inflammatory disease (PID) comprises a spectrum of inflammatory disorders of the upper female genital tract, including any combination of endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis.

The aetiology of PID is often polymicrobial

- Sexually transmitted organisms especially *Neisseria gonorrhoeae* and *Chlamydia trachomatis*
- Non-sexually transmitted pathogen (e.g., anaerobes, *Gardnerella vaginalis*, *Haemophilus influenzae*, enteric Gram-negative rods, and *Streptococcus agalactiae*), Cytomegalovirus (CMV), *Mycoplasma hominis*, and *Ureaplasma urealyticum*

INCUBATION PERIOD: varies with the causative organism

PRESENTATION / FINDINGS

- Acute PID is difficult to diagnose because of the wide variation in the symptoms and signs
- Many women with PID have mild symptoms
- Many episodes of PID go unrecognized

Nonspecific symptoms or signs include

- Lower abdominal pain
- Abnormal bleeding - abnormal menses, inter-menstrual bleeding
- Deep dyspareunia
- Increased vaginal discharge

DIAGNOSTIC CRITERIA

Empiric treatment of PID should be initiated in sexually active young women and other women at risk for STDs if they have pelvic or lower abdominal pain, if no cause for the illness other than PID can be identified, and if one or more of the following minimum criteria are present on pelvic examination:

- Cervical motion tenderness or uterine tenderness or adnexal tenderness

The following additional criteria can be used to enhance the specificity of the minimum criteria and support a diagnosis of PID:

- Oral temperature >101° F (>38.3° C)
- Abnormal cervical or vaginal mucopurulent discharge
- Presence of abundant numbers of white blood cells (WBCs) on saline microscopy of vaginal secretions
- Elevated erythrocyte sedimentation rate
- Elevated C-reactive protein, and
- Laboratory documentation of cervical infection with *N. gonorrhoeae* or *C. trachomatis*

The most specific criteria for diagnosing PID include the following:

- Transvaginal sonography or magnetic resonance imaging techniques showing thickened, fluid-filled tubes with or without free pelvic fluid or tubo-ovarian complex, or Doppler studies suggesting pelvic infection (e.g., tubal hyperemia); and
- Endometrial biopsy with histopathologic evidence of endometritis
- Laparoscopic abnormalities consistent with PID

MANAGEMENT

- Screen patient for all STIs
- Refer gynaecologist for further management

OPHTHALMIA NEONATORUM

DEFINITION

Conjunctivitis which occurs in the first 4 weeks of life in a neonate

ETIOLOGY

- i) *Chlamydia trachomatis* (the commonest causative organism)
- ii) *Neisseria gonorrhoeae*
- iii) Other bacterial agents : *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Pseudomonas* and Enteric gram negative organism
- iv) Viral (HSV 1 & 2)

INCUBATION PERIOD

C. trachomatis conjunctivitis presents at 5-14 days of life

Gonococcal conjunctivitis presents at 2-5 days of life (range 0-28 days)

PRESENTATION / FINDINGS

An initial watery conjunctival exudate may rapidly become purulent, thick and blood stained. The conjunctiva and eyelid are oedematous. If untreated, there may be development of keratitis, iridocyclitis, corneal ulceration, perforation, pannus formation, scarring, and eventually blindness.

In some infants with Chlamydia-associated conjunctivitis, the infection persists for a longer period and the babies later develop pharyngitis and pneumonia if left untreated.

INVESTIGATIONS

- Gram stain smear of conjunctival discharge or scrapping
- Culture for *N. gonorrhoeae*
- Direct Immunofluorescent test for *C. trachomatis*
- Check VDRL / RPR of the infant to exclude associated congenital syphilis

TREATMENT

Gonococcal Ophthalmia

Systemic : Ceftriazone 50mg/kg I.V. or I.M. daily for 3-7 days or
Cefotaxime 50mg/kg/day I.V. or I.M. in two divided doses for 3-7 days

Local : Irrigate eyes with sterile normal saline at least hourly to eliminate discharge
Topical antibiotics are optional

Chlamydial Ophthalmia

Systemic

First week of life

Erythromycin 20 mg/kg 6 hourly P.O. for 14 days (< 2 kg)
Erythromycin 30 mg/kg 6 hourly P.O. for 14 days (> 2 kg)
(Erythromycin ES 50mg/kg b.d. P.O. for 14 days)

More than 1 week of life

Erythromycin 40 mg /kg 6 hourly P.O. for 14 days

Local

Tetracycline 1% ointment 6 hourly for 7-14 days

Systemic treatment is essential. Refer to ophthalmologist to assess for ocular complications.

ADVICE

Careful handling of neonate to prevent direct spread to others.

CONTACT TRACING

The mother should be treated on epidemiological grounds. Screen both parents for other STIs.

FOLLOW-UP

On discharge, infants should be seen at 2 weeks to have a repeat eye swab gram stain and culture.

GENITAL HERPES

AETIOLOGY

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

INCUBATION PERIOD: 2–21 days

PRESENTATION

- No symptoms – 20%
- Minor symptoms (unrecognized) – 60%
- Painful sores – 20%

Symptoms

- Painful ulceration, dysuria, vaginal or urethral discharge
- Systemic symptoms e.g. fever and myalgia
- Patient may be asymptomatic, and the disease unrecognized
- Rarely, systemic symptoms may be the only evidence of infection
- Systemic symptoms are much commoner in primary than in initial or recurrent disease

FINDINGS

- Blistering and ulceration of the external genitalia (\pm cervix/rectum)

First episode - primary
- non-primary

Recurrent

Atypical

- Inguinal lymphadenopathy
- Complications
 - Autonomic neuropathy, resulting in urinary retention
 - Aseptic meningitis

FIRST EPISODE PRIMARY

- First noted outbreak with no previous exposure to HSV and sero-negative for HSV-1 & HSV-2
- Lesions usually heal within a month
- Following primary infection, the virus becomes latent in local sensory ganglia, periodically reactivating to cause symptomatic lesions or asymptomatic, but infectious, viral shedding
- Median recurrence rate after a symptomatic first episode is 0.34 recurrences / month for HSV-2 and 0.08 recurrences / month for HSV-1
- Recurrence rates decline over time in most individuals, although this pattern is variable

	First episode primary
Symptoms & signs	<ul style="list-style-type: none"> • Vesicular-ulcerative lesions • Lesions multiple, bilateral, different stages • Tender adenopathy (90% & bilateral)
Complications	<ul style="list-style-type: none"> • Occur in 40-70% <ul style="list-style-type: none"> - Difficulty urinating (10-15%) - Systemic illness (25%) e.g. headache, photophobia, neck stiffness, pharyngitis • Rarely disseminate

FIRST EPISODE NON - PRIMARY

- First noted outbreak, previous exposure to HSV, sero-positive to other HSV type
- Symptoms and signs less severe as compared to first episode primary

RECURRENT HERPES GENITALIS

- An outbreak of HSV that follows a recognized outbreak of HSV
- Milder than primary infection
- Certain factors may precipitate an attack such as trauma, menstruation, concurrent infection or fever, immune suppression, stress, and UV light
- Lesions usually heal within 1-2 weeks

	Symptomatic recurrent episode
Symptoms & signs	<ul style="list-style-type: none"> • Prodromal symptoms (itching, tingling, neuralgia) may occur hours or days before episode (70%) • Lesions localised and unilateral • Tender adenopathy (25% & unilateral)
Complications	<ul style="list-style-type: none"> • Systemic symptoms uncommon

ATYPICAL HERPES GENITALIS

- Atypical recurrent genital herpes is frequently encountered
- Misdiagnosis is common as a consequence
- Present as excoriation marks, folliculitis, fissure, or erythema over the genital region

ASYMPTOMATIC HERPES

- 80% of patients have no symptoms following infection
- Shedding of virus may occur from intact epithelial surface in the absence of symptoms

- Virus is shed intermittently 5 – 20% days per year (17 to 72 days per year by PCR testing)
- Responsible for transmission of HSV in majority of cases (70%)
- Majority of individuals with asymptomatic HSV-2 infection subsequently develop symptomatic lesions

INVESTIGATIONS

Laboratory tests (essential as it influences management, prognosis and counseling)

Virus antigens

HSV nucleic acid (DNA) by PCR

Virus culture (culture live virus from lesion)

Tzanck test

Biopsy

Serology (Group specific antibodies / type specific antibody)

Virus antigens

- Direct examination of fluid from (early & atypical) blister for HSV Ag using IFAT or IPA
- Differentiate HSV-1 from HSV-2
- Sensitivity 49–80%
- Specificity High (if type specific reagents used)
- False negative may occur e.g. due to inadequate smear collection or due to anti-viral therapy

HSV nucleic acid by polymerase chain reaction

- Useful for all stages but not widely available
- Detects HSV DNA, type specific
- Test of choice for the diagnosis of HSV infection of the CNS / deep seated infections e.g. lung

Virus culture

- Gold standard for diagnosing HSV infection (early & atypical)
- Fluid & cells from base of lesion with pre-moistened swab in viral transport medium
- Sensitivity Highest in vesicular stage
70–80% in first episode
50% in ulcers of recurrent lesions
25% in crusted lesions

- Specificity Virtually 100% (if typing performed)
- Negative culture does not exclude infection

Viral isolation & stage of disease in genital HSV infection (% HSV culture-positive lesions)

Maculopapular (N=9)	Vesicle (N=136)	Pustule (N=68)	Ulcer (N=132)	Crust (N=93)
25	94	87	70	27

Tzanck test / smear

- Easy and rapid bedside test in the presence of classical clinical features
- However, it is subjective and not a definitive test
- Specimen obtained from base of ulcer, not vesicle fluid
- Air dry, fix in 95% ethanol & apply Giemsa stain
- Look for multinucleated giant cells
- Sensitivity 40 – 60%
- Does not differentiate HSV from VZV
- Insensitive & nonspecific & should not be relied on for diagnosis of HSV infection

Biopsy

- For persistent ulcers and verrucous lesions in immunosuppressed patients
- Typical histological changes

Serology

Antibodies of IgG class persist indefinitely

Group specific antibodies

- Most commercial tests for HSV antibodies are not type specific (e.g. CFT and many EIAs)
- Do not reliably distinguish type 1 & type 2 (Both HSV types exhibit 45% DNA sequence homology)

Type specific serology tests (TSSTs)

- Assays for HSV antibodies (since 1999)
- Type-specific immune response can take 8-12 weeks to develop following primary infection
- Uses type-specific EIAs based on glycoprotein G (gG1, gG2) or western blot assays
- Detects HSV-specific glycoprotein
 - G2 for HSV2
 - G1 for HSV1
- Has a sensitivity of 80-98% and a specificity of 96% or more
- Caution is needed in interpreting results because even highly sensitive and specific assays have poor predictive values for **low prevalence** populations

Comparison of detection methods for HSV in clinical lesions

	Tzanck smear	Virus culture	Antigen detection (IFAT or EIA)	PCR
Sensitivity	Low	High	High	Highest
Specificity	Low	High	High	Highest
Viral typing	No	Yes	Yes (IFAT)	Yes
Comments	Show giant cells; presumptive evidence of infection Unreliable in patients with incompetent CMI	Ideal test sensitivity declines as lesions heal	Rapid but sensitivity declines as lesions heal	Rapid but expensive. Useful even in late lesions. Test of choice in examination of CSF body aspirates

TREATMENT

FIRST EPISODE OF GENITAL HERPES

General advice

- Saline bathing
- Analgesia (systemic or local e.g. lidocaine gel)
- Treat any secondary infection

Specific antiviral therapy

- Oral antiviral drugs indicated within 5 days of the start of the episode and while new lesions are still forming
- Acyclovir, valaciclovir and famciclovir all reduce severity & duration of clinical attacks
- Antiviral therapy does not alter the natural history of the disease
- None eradicate infection or latent virus
- Topical agents are less effective than oral agents
- Intravenous therapy indicated when patient cannot swallow or tolerate oral medication because of vomiting
- Combined oral and topical treatment is of no benefit
- BASHH guidelines recommend > 5 days of treatment if :
 - New lesions continue to form
 - Symptoms & signs are severe, or
 - Patient also has HIV

Recommended treatment for first episode of genital herpes - all for 5 days

- Acyclovir 200 mg 5 times/day or 400 mg t.d.s P.O.
- Valaciclovir 500 mg to 1g b.d. P.O.
- Famciclovir 250 mg t.d.s. P.O.

Extend beyond 10 days if healing incomplete

Management of complications

- Hospitalization may be required for urinary retention, meningism, and severe constitutional symptoms.
- If catheterization is required, suprapubic route 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 recatheterizations

HIV positive patients

- Some clinicians advocate a 10-day course of treatment
- Lesions unresponsive to therapy may be due to drug resistant HSV and drug susceptibility testing of the virus isolate should be considered

RECURRENT GENITAL HERPES

- Recurrences are self-limiting and generally cause minor symptoms
- Management decisions should be made in partnership with the patient
- Strategies include
 - Supportive therapy only
 - Episodic antiviral treatment
 - Suppressive antiviral therapy

General advice / Supportive therapy

- Saline bathing
- Analgesia (systemic or local e.g. lidocaine gel)
- Treat any secondary infection

Episodic antiviral therapy

- If severe &/or prominent prodromal symptoms
- Patient provided with a supply of antiviral drug and to initiate during prodrome or early in attack (within 1 day)
- Reduces severity & duration by a median of 1-2 days

Recommended treatment for episodic therapy

- Acyclovir 400 mg t.d.s. P.O. for 5 days or
200 mg 5 times / day P.O. for 5 days or
800 mg b.d. P.O. for 5 days or 800 mg t.d.s. P.O. for 2 days
- Valaciclovir 500 mg b.d. P.O. for 3 – 5 days or
1 g daily P.O. for 5 days
- Famciclovir 125 mg b.d. P.O. for 5 days or
1 g b.d. P.O. for 1 day

Suppressive antiviral therapy

- If very frequent (≥ 6 per year), severe, prolonged, or with psychosocial problems
- Choice of treatment depends on patient compliance and cost
- Reduce (by 70-80%) the number of recurrences with improvement of QOL
- Patients with lower rates of recurrences will probably also have fewer recurrences with treatment
- Does not eliminate subclinical viral shedding
- Discontinue after 12 months to assess ongoing frequency of recurrences because outbreaks diminish with time. The minimum period of assessment should include two recurrences. Patients who continue to have unacceptably high rates of recurrence may restart therapy
- Safety and resistance data on patients on long-term therapy with acyclovir now extend to over 13 years of continuous surveillance

- Daily suppressive treatment with valaciclovir 500mg daily decreases the rate of HSV-2 transmission in discordant, heterosexual couples in which the source partner has a history of genital HSV-2 infection. Such couples should be encouraged to consider suppressive antiviral therapy as part of a strategy to prevent transmission, in addition to consistent condom use and avoidance of sexual activity during recurrences (Corey L et al. N Eng J Med 2004;350(1):11-20).

Recommended treatment for suppressive therapy

- Acyclovir 400 mg b.d. P.O. or
 200 mg q.i.d P.O. or
- Valaciclovir 500 mg once daily P.O. or
 1 g once daily P.O. or
- Famciclovir 250 mg b.d. P.O. or
 500 mg daily P.O.

Severe disease / complication that needs hospitalization (disseminated infection, pneumonitis, hepatitis, or CNS complication e.g. meningitis or encephalitis)

- IV acyclovir 5-10mg/kg 8 hourly for 2-7 days or until clinical improvement followed by oral to complete at least 10 days total treatment.

ASYMPTOMATIC VIRAL SHEDDING

- Occurs in individuals with genital HSV-1 and HSV-2 infection
- Occurs most commonly in
 - Patients with genital HSV-2 infection
 - In the first year after infection
 - In individuals with frequent symptomatic recurrences
- Is an important cause of transmission
- May be reduced by acyclovir 400 mg twice daily

COUNSELING

- To both the infected person and partner
- Help cope with infection and prevent sexual and perinatal transmission
- Should cover
 - Natural history of genital herpes
 - Use of antiviral drugs for symptom control
 - Risks of transmission by sexual and perinatal means
 - Abstain 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 & prevent onward transmission
 - Efficacy of condoms to prevent sexual transmission has not been formally assessed
 - Pregnancy issues for both men and women

MANAGEMENT OF GENITAL HERPES IN PREGNANCY

- Categorized into management of first episodes and recurrent episodes
- Accurate clinical classification is difficult. Viral isolation, typing & testing of paired sera may be helpful

FIRST EPISODE GENITAL HERPES

First and second trimester acquisition

- Acyclovir is not licensed for use in pregnancy; however, there is substantial clinical experience supporting its safety i.e. the benefits of antiviral therapy outweigh the risk of withholding treatment
- Management is in line with clinical condition using either oral or intravenous acyclovir in standard doses

- Vaginal delivery should be anticipated
- Continuous acyclovir in the last 4 weeks of pregnancy reduces risk of both clinical recurrence at term and delivery by caesarean section (CS)

Third trimester acquisition

- If a true first episode is confirmed, CS should be considered for all women, particularly those developing symptoms after 34 weeks of gestation, as the risk of viral shedding is very high
- CS for the prevention of neonatal herpes has not been evaluated in randomized controlled trials and may not be completely protective against neonatal herpes
- If vaginal delivery is unavoidable, acyclovir treatment of mother and baby may be indicated

RECURRENT GENITAL HERPES

- Sequential cultures during late pregnancy do not predict viral shedding at term
- If there are no genital lesions at delivery, CS to prevent neonatal herpes should not be performed
- Symptomatic recurrences during the third trimester are likely to be brief; vaginal delivery is appropriate if no lesions are present at delivery
- Continuous acyclovir in the last 4 weeks of pregnancy may modestly reduce the risk of clinical recurrence at term but not of CS. Acyclovir reduces, but does not eliminate, viral shedding
- Continuous acyclovir in the last 4 weeks of pregnancy may be cost-effective compared with no therapy or with CS.

GENITAL LESIONS AT THE ONSET OF LABOUR

- Current practice in the UK is for delivery by CS, despite lack of evidence for its effectiveness
- The risks of vaginal delivery for the fetus are small and must be set against risks to the mother of CS

PREVENTION OF ACQUISITION OF INFECTION

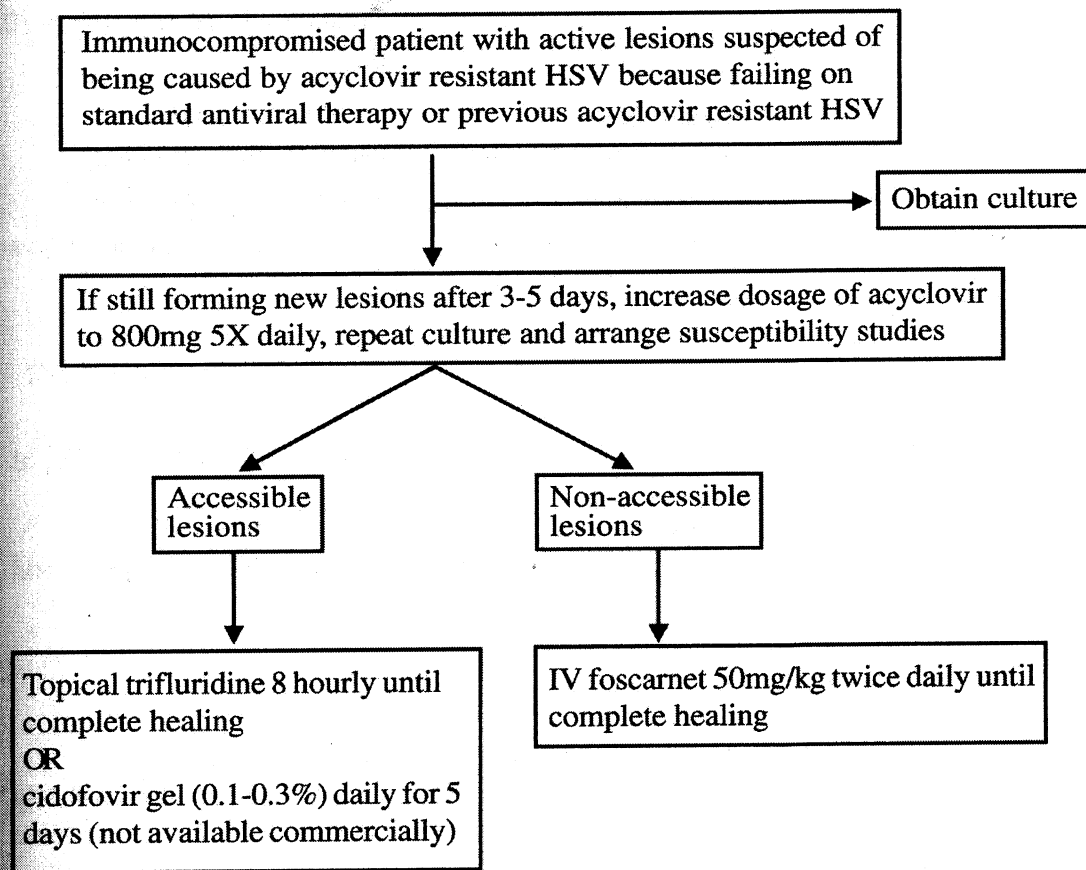
- Maternal risk of HSV acquisition in pregnancy varies geographically and local epidemiological surveillance should guide strategy for prevention
- All women should be asked at their first antenatal visit if their partner/s have ever had GH
- Asymptomatic female partners of men with GH should be strongly advised not to have sex during recurrences. Conscientious use of condoms throughout pregnancy, especially the third trimester, may reduce the risk of acquisition, but this is unproven
- Pregnant women should be advised of the risk of acquiring HSV-1 as a result of oro-genital contact
- Identifying susceptible women by means of type-specific antibody testing has not been shown to be cost-effective
- All women, not just those with a history of GH, should undergo careful vulval inspection at the onset of labour to look for clinical signs of herpes infection
- Mothers, staff, and other relatives/friends with active oral lesions should be advised about the risk of postnatal transmission

GENITAL HERPES AND PERINATAL INFECTION

Infants exposed	- at birth	Follow-up Some physicians culture mucosa but if asymptomatic, the risk is low
	- near term	Risk of neonatal herpes Treat with acyclovir
Neonatal herpes	IV ACV 20mg/kg 8hrly	21 days for disseminated / CNS disease 14 days for disease limited to skin & mucous membranes

GENITAL HERPES IN IMMUNO COMPROMISED PATIENTS

- HSV infection unusually severe / frequently recurrent / prolonged / unusual site / multi-focal
- Genital herpes caused by HSV-2 doubles risk of HIV infection through sexual transmission
- Management of herpes in immunocompromised individuals (Guideline on consensus symposium on management of acyclovir resistant HSV – 1994)



Suppressive antiviral therapy

A standard suppressive regimen should be used for immunosuppressed patients who have frequently recurring genital herpes

Treatment guidelines for HIV infected patients

Condition	Recommended	Alternatives
Genital HSV infection		
HIV	Episodic Acyclovir 400mg tds for 5-10days	Acyclovir 200 mg 5X per day for 5-10 days Famciclovir 500 mg b.d. for 5-10 days Valaciclovir 1g b.d. for 5-10 days
	Suppressive Acyclovir 400-800mg 2-3X per day	Famciclovir 500 mg b.d. Valaciclovir 500 mg b.d.
Resistant to acyclovir (lesions persist or recur)	Foscarnet 40mg/kg IV 8hrly until healed	Topical cidofovir gel for 5days

ADVICE

- ▀ Detailed explanation of condition with long term implications for health of themselves and partner
- ▀ Reinforced with clear and accurate written information
- ▀ Use of condoms may prevent transmission of HSV to uninfected partners and should be encouraged

CONTACT TRACING

- ▀ Effective way of detecting individuals with unrecognized disease
- ▀ May clarify whether a partner is infected or not (using type-specific antibody testing if necessary). This may help reduce anxiety about transmission or reinforce need to reduce the risk of transmission
- ▀ Awareness of diagnosis in a partner or ex-partner may prevent further onward transmission

FOLLOW -UP

Weekly until ulcers are healed

GENITAL WARTS

AETIOLOGY

- Benign squamous epithelial tumour caused by *Human papilloma virus* (HPV)
- Genotypes 6 & 11 causes > 90% of cases
- Genotypes 16 & 18 – usually leads to subclinical lesions associated with intraepithelial neoplasia (IN) and anogenital cancer
- HPV types infecting anogenital region can be divided into 2 groups :

High risk HPV (Oncogenic)

16,18,26,31,33,35
39,45,51,52,53,56
58,59,66,73,82

Low risk HPV

6,11,40,42,43,44
54,61,72 & 81

INCUBATION PERIOD: 2 weeks – 8 months (usually 3 months)

PRESENTATION

- Very infectious – more than 75% of sexual partners develop warts when exposed
- The life time risk of developing genital warts / HPV infection is 10 & 50% respectively
- **Transmission of genital HPV infection**
 - Sexual contact - most common
 - partner with clinical/subclinical infection
 - Perinatal - may be transmitted
 - leads to laryngeal papillomas
 - Other means
 - digital lesions - usually in children
 - fomites - no good evidence
- **Symptoms**
 - Majority are asymptomatic
 - Little physical discomfort, but are disfiguring and psychologically distressing

- Sometimes associated with itching, burning, bleeding, vaginal or urethral discharge, dyspareunia and outlet obstruction if lesion is large

FINDINGS

a. Site

- Multifocal infection of anogenital skin lesions
- Most common at areas traumatized during sexual intercourse, but may occur at any site
- Uncircumcised men (glans penis, coronal sulcus, fraenum, inner aspect of foreskin)
- Circumcised men (shaft of penis often involved. May also occur on scrotum, groin, perineum and anal area)
- In females (fourchette, labia minora, labia majora, clitoris, urethral meatus, perineum, anal region, vestibule, introitus, hymen, vagina and ectocervix)
- Urethral meatus is affected in 20-25% of males and 4-8% of females
- Anal warts seldom found proximal of the dentate line
- Intraanal warts more common with receptive anal intercourse
- Extragenital lesions may be seen on oral cavity, larynx, conjunctivae, and nasal cavity

b. Morphology

Clinical disease (Visible warts)

- Single or multiple lesions
 - May coalesce into large plaques (more common in immunosuppressed and in diabetics)
 - Colour varies from pinkish-raspberry to salmon-red (non-keratinised warts), grayish-white (heavily keratinized lesions), and ashen-grey to brownish black (pigmented lesions)
 - On warm, moist, non-hair bearing skin tend to be soft and non-keratinised
 - On dry hairy skin are firm and keratinized
- 3 major lesional types
- acuminate warts - predominate on mucosal epithelium
 - papular warts - common on keratinized epithelium
- often hyperkeratotic or pigmented
 - macular lesion - on mucous membranes
- grayish-white, pinkish-red or reddish-brown

- **'Giant condyloma' (Buschke-Lowenstein tumour)**
 - very rare variant of HPV 6 and 11-associated disease
 - characterized by increase in size and appears as large cauliflower-like masses
 - characterized by aggressive downgrowth into dermal structures
 - complex histological pattern with areas of benign condyloma intermixed with foci of atypical epithelial cells or well differentiated squamous-cell carcinoma
 - diagnosis requires multiple biopsies

INVESTIGATIONS

Diagnosis

- Naked eye examination in most cases
- If in doubt, or lesion is atypical or pigmented, biopsy for histology should be done

Assessment of lesions

- Examine external anogenital & surrounding skin under good illumination
- All women should have a speculum examination to identify presence of coexisting vaginal/or cervical warts
- Biopsy of cervical lesions mandatory & done under colposcopic guidance
- Meatoscopy if meatus involved or history of distortion of urine flow or bleeding
- Occasionally urethroscopy indicated for more proximal warts
- Anoscopy/proctoscopy up to dentate line if anal warts present or history of anal receptive sex
- Classify warts as to morphology
- Recording lesions on genital maps at each visit is useful, provides a record of approximate number, distribution, and response to treatment

Subclinical lesions

- Lesions of external anogenital skin not seen by the naked eye but detectable by soaking skin with 5% acetic acid and examining with a colposcope
- Lesions usually asymptomatic, but may cause irritation and inflammation of skin e.g. atypical balanoposthitis or vulvitis

- Not recommended that these lesions are sought unless clinically indicated for the following reasons :
 - many acetowhite lesions are not caused by HPV
 - histologic changes are not specific for HPV infection and
 - treatment does not affect course of disease in the patient or their partner

TREATMENT

Natural course of HPV infection

- Untreated visible warts may resolve spontaneously (40%), remain the same, or increase in size

Primary goal

- Removal of visible / symptomatic warts

Indications for treating genital warts

- Cosmetic reasons
- Reduce transmissibility (no controlled studies)
- Provide relief from symptoms
- Improve self esteem

Effects of treatment

- May reduce HPV DNA in genital tissue, and therefore reduce infectivity
- Does not eradicate HPV or reduce the risk of genital cancer
- No controlled studies on effects of treatment and HPV transmission rates
- Recurrence rates often 20—30% or more

Treatment

- All treatments have significant failure and relapse rates
- Treatment decisions should be made after discussing the appropriate options with the patient, taking into account their preference and convenience
- Treatment may involve discomfort and local skin reactions. Written information on management of treatment side effects is recommended
- Local anaesthetic creams plus or minus injection with e.g. lignocaine 2% could be used before ablative therapy to minimize discomfort.
- Adrenaline-containing anaesthetic should be avoided on the penis and around the clitoris.

Treatment choice

- The evidence to direct first and second line treatments is not strong
- Treatment choice depends on a number of factors including the number, size, site, morphology, patient preference, cost, convenience, adverse effects, pregnancy, and provider experience
- Soft non-keratinised warts respond well to podophyllin, podophyllotoxin, and cryotherapy, excision, or electrocautery
- Keratinised lesions are better treated with physical ablative methods such as cryotherapy, excision, or electrocautery
- Imiquimod may be suitable for both types
- People with a small number of low volume warts irrespective of type are best treated with ablative therapy from outset
- No treatment is an option at any site, particularly in vaginal and anal canal as they may resolve spontaneously with time

Treatments available for external genital & perianal warts

Patient applied

Podophyllotoxin 0.5% solution or 0.15% cream daily for 3 days in a week

Imiquimod 5% cream 3 times per week up to 16 weeks

Provider administered

Podophyllin 10-20% 1-2 times per week

Cryotherapy with liquid nitrogen cryoprobe once in 1-2 weeks

Trichloroacetic acid 40-100% weekly

Scissor excision

Surgery

Electrosurgery

Laser surgery

Patient applied therapies

Can be safely applied by the patient (refer to appropriate section)

Provider administered therapies

Initial treatment is usually with locally applied caustic agents.

It is usual to start with podophyllin – a cytotoxic agent – which should be applied to the lesions in strengths of 10% or 20% in industrial spirit and repeated at least twice or even three times a week (refer appropriate section).

If it is ineffective after 4-6 weeks, the more caustic agent glacial TCA 50-100% may be used. This agent is more useful for hyperkeratotic warts but even so these warts are often resistant and cryotherapy or electrosurgery will be needed.

Electrosurgery, or surgical excision should be considered at an earlier stage if the warts are large or numerous.

General guide to the treatment of genital warts

Site or type of warts	Start with	One week	Two weeks	Three weeks	Four weeks
Few, small, and soft	10-25% podophyllin or podophyllotoxin solution or cryotherapy	→	→	Trichloroacetic acid	Cryotherapy, electrocautery
Solitary, large, and discrete	Electrocautery diathermy, excision or cryotherapy				
Extensive, multiple vegetations	10-25% podophyllin or podophyllotoxin solution or trichloroacetic acid	→		→	Cryotherapy, surgical excision
Hyperkeratotic or keratinised	Trichloroacetic acid or cryotherapy	→		Electrocautery, diathermy	
Intrameatal	Cryotherapy	→		Electrocautery, cryotherapy	
Cervical	Colposcopy + biopsy ? → cryotherapy, laser				
Vaginal	Cryotherapy or trichloroacetic acid				
Perianal	Cryotherapy or podophyllotoxin cream				
Pregnancy	None – unless discrete small vaginal, vulval, or introital, then use trichloroacetic acid or cryotherapy -? electrocautery				* Note : do not use podophyllotoxin, podophyllin, fluorouracil, or imiquimod

Overview of clearance and recurrence rates with different treatments for external genital warts**Patient applied therapies**

Treatment	Clearance rate (%)		Recurrence rate (%)
	End of treatment ≥ 3months		
Imiquimod	50-62	50-62	13-19
Podophyllotoxin	42-88	34-77	10-91

Provider applied therapies

Treatment	Clearance rate (%)		Recurrence rate (%)
	End of treatment ≥ 3months		
Podophyllin	32-79	22-73	11-65
TCA	50-81	70	36
Surgical excision	89-93	36	0-29
Electrotherapy	93-94	78-91	24
Laser therapy	27-89	39-86	<7-45
Cryotherapy	63-88	63-92	0-39
Interferon	19-62	36-62	0-33

Reproduced with kind permission of K R Beutner (modified to include imiquimod)
Studies not strictly comparable as methods and endpoints differ across the studies

Chemical treatment - patient applied**Podophyllotoxin (Podofilox, condylox)**

- Antiproliferative with cytotoxic & antimetabolic action
- Purified extract of podophyllin in the form of 0.5% solution or 0.15% cream or gel is suitable for home treatment
- Indication : Few, small and soft anogenital warts
- Method
 - Twice daily application for 3 days, followed by 4 days rest for 4 cycles
 - Solution applied with cotton swab; gel with finger
 - Cream may be easier for many patients to apply, especially at the anus
 - Discontinue if significant side effects (local irritation)

Cure rates of 70-80% over 4 wks for first episode

Caution : Avoid in pregnancy

Imiquimod (Aldara)

- Topical cell mediated immune response modifier – produces a TH1-like response when applied to skin infected with HPV
- Indication : Suitable for all external AGWs
- Method
 - Apply thin layer of 5% cream to external visible warts, then rub in until cream vanishes; apply 3 times weekly & wash off 6-10 hours later for up to 16 weeks
 - Response to treatment may be delayed for some weeks
- Cure rates 77% in women, 40% circumcised & 62% uncircumcised men over 4-12 wks & low relapse rate
- Caution: Not approved for use in pregnancy / internally

Chemical treatment - physician applied

Podophyllin resin

- Non-standardised cytotoxic compound
- Antiproliferative with cytotoxic, antimitotic action causing tissue necrosis
- Animal experiments indicate teratogenic and oncogenic properties but evidence of these in humans is lacking
- Indication : few, small and soft anogenital warts; intrameatal warts
- Method
 - Use 10 –25% Podophyllin in compound tincture of Benzoin (10% Podophyllin in compound tincture of Benzoin for vaginal and anal warts)
 - Apply carefully to the warts while avoiding surrounding normal tissue
 - Protect surrounding skin with vaseline
 - Allow treated area to dry before contact with normal tissue or mucosa, especially in anal warts. For vaginal warts, treated area must be dry before removing speculum
 - Instruct patient to wash it off thoroughly in 4-5 hours
 - Treat twice per week
 - If poor response after 4 – 6 weeks of treatment, alternative treatment is indicated

- **Caution**
 - Limit application to 10cm² or 0.5ml for external warts and less than 2cm² for vaginal warts
 - Can cause serious systemic side effects if applied in excess
 - Avoid on cervix, vagina or anal canal, & in pregnancy - potentially teratogenic & oncogenic; (squamocolumnar junction prone to dysplasia) and increased systemic absorption likely if used internally
- Advise patients to use condoms
- Yearly pap smear for women with anogenital warts
- Atypical or persistent warts should be biopsied

Trichloroacetic acid

- Acts as caustic agent resulting in protein coagulation with cellular necrosis of wart tissue (destructive action)
- Indication : Few, small soft or hyperkeratotic warts; Used in most anatomical areas
- Method
 - Weekly application of TCA 40-100% solution in a specialist clinic setting only; small amount applied & allowed to dry until a white frosting develops
 - Intense burning sensation may be experienced for 5-10mins after application
- Caution
 - Ulceration into dermis may occur, therefore not recommended for large volume warts;
 - Wash excess with liquid soap or sodium bicarbonate (NaHCO₃)
 - Extremely corrosive; protect normal skin with vaseline

Physical ablation

Excision

- Indication : Pedunculated warts, & small numbers of keratinised warts at anatomically accessible sites
- Best done by a specialist & requires local anaesthetic, because may cause scarring
- Haemostasis achieved with electrocautery or use of a haemostatic agent
- Repeated as required

Cryotherapy

- Indication : Small to moderate number of warts
- Apply with liquid nitrogen spray, cryoprobe or cotton-tip applicator
- Causes cytolysis at dermo-epidermal junction resulting in necrosis
- Treatment applied until a “halo” of freezing seen a few mm around the lesion (about 10-20 seconds)
- A freeze, thaw, freeze technique should be used
- LA (topical or injection) may facilitate treatment
- Randomised trials show similar response as compared to podophyllin, TCA, & cautery

Electrosurgery

- Indication : Used in most anatomical areas
- 3 types commonly used
 - Electrocautery (results in burning of treatment site & surrounding tissue)
 - Hyfrecator (acts by electrofulguration resulting in superficial charring & little dermal damage or for deeper tissue penetration by eletrodessication)
 - Monopolar (different waveforms can be generated, allowing dessication, cutting, or coagulation. Results in cleaner cut & less damage to surrounding tissue)
- Caution: leave skin bridges between treatment sites to aid healing & minimise scarring

Laser surgery

- Indication: CO2 laser suitable for large volume warts & in difficult anatomical areas, e.g. urethral meatus or intra-anal, or extensive vaginal warts
- May be useful for HIV-infected patients with very large external genital warts
- Caution: All electrosurgical & laser techniques result in a plume of smoke which contain HPV DNA & may cause infection of the respiratory tract in operating personnel. Therefore, masks should be worn & adequate extraction provided

Adverse effects of treatment

	Adverse effects & incidence (%)
Podophyllotoxin	Burning at application site (70), pain (50), inflammation (70); low risk for systemic toxicity
Imiquimod	Erythema (70); irritation, ulceration & pain (10); burning, erosion, flaking, edema, induration, & pigmentary changes; minimal systemic absorption
Podophyllin	Local irritation, erythema, burning, & soreness (75); possible mutagenicity, oncogenicity Application of large quantities may cause peripheral neuropathy, coma, and hypokalemia
Trichloroacetic acid	Local pain & irritation; no systemic side effects
Cryotherapy	Pain or blisters at application site (20)
Surgical excision	Pain (100), bleeding (40), scarring (10), risk for burning and allergic reaction from LA
Laser treatment	Similar to surgical excision; risk for HPV via smoke plume

ADVICE

- Detailed explanation of condition with long term implications for health of themselves and partner
- Reinforced with clear and accurate written information
- Condom usage with regular sex partners not shown to affect treatment outcome, although one study suggested a reduction in new HPV associated lesion formation
- Use of condoms may prevent transmission of HPV to uninfected partners and should be encouraged

CONTACT TRACING

- Current sexual partner may benefit from assessment as
 - they may have undetected genital warts
 - undetected other STIs
 - need explanation and advice about disease process in partner
- Tracing of previous sexual partner is not recommended

PREVENTION

Primary prevention

HPV vaccines

- Quadrivalent vaccine (Gardasil-MSD); US FDA approved June 2006, EU approved July 2006 & Malaysia Oct 2006
- Bivalent vaccine (Cervarix-GSK); EU approved September 2007; submitted to US FDA on 29 March 2007 and awaiting approval. Approved in Malaysia in December 2007
- Both vaccines have a favourable tolerability profile
 - The quadrivalent vaccine (GARDASIL) has been shown to be highly effective in preventing cervical cancer, CIN 2/3, AIS, vulval and vaginal dysplasia, and other anogenital diseases, including genital warts caused by HPV 6, 11, 16, and 18 in women naïve to the relevant HPV types
 - The bivalent vaccine (Cervarix) has been shown to be highly effective in preventing cervical cancer, CIN 2/3, & AIS caused by HPV 16 and 18 in women naïve to the relevant HPV types but not against genital warts caused by HPV 6 and 11

SPECIAL CONSIDERATIONS

Anatomical sites

Podophyllin, imiquimod & 5 FU no longer recommended for internal warts

Intravaginal

- Cryotherapy, TCA, & electrosurgery are recommended treatments
- If podophyllin used, apply carefully to no more than a total area of 2 cm² weekly

TRICHOMONIASIS

AETIOLOGY

Trichomonas vaginalis

INCUBATION PERIOD : 4 days to 4 weeks

PRESENTATION / FINDINGS

Female

- Diffuse, malodorous, frothy, yellow-green discharge with vulval itching ± dyspareunia, ± dysuria (vulvitis and vaginitis)
- Strawberry cervix
- Occasionally lower abdominal discomfort and sometimes asymptomatic

Male

- 15-50% asymptomatic
- Usually contacts of infected women
- Scanty or moderate urethral discharge (50-60%)
- Rarely prostatitis or balanoposthitis

INVESTIGATIONS

Female

Saline wet smear from posterior fornix

- motile flagellates oval or pear shaped organism with jerky movement
- positive in 40-80% of cases

Cervical pap smear

- sensitivity 60%, but high rate of false positives
- not recommended

Culture

- 95% sensitivity

OSOM Trichomonas Rapid Test and Affirm VP III

- sensitivity 83% and specificity 97%

PCR

- sensitivity and specificity almost 100%

Male

Saline wet smear

- positive in 30% of cases

Urethral or first void urine culture

- positive in 60-80% of cases

TREATMENT

Recommended

- Metronidazole 400 mg b.d. P.O. for 5 – 7 days or
- Metronidazole 2 g single dose P.O. or
- Tinidazole 2 g single dose P.O.

(95% cure rate; resistance rarely reported; published data suggest no increased teratogenic risk in pregnancy)

ADVICE

- No unprotected sex until treatment completed
- No alcohol (antabuse effect with metronidazole)

CONTACT TRACING

- Examine and investigate current partner for full range of STIs
- Treat sex partners epidemiologically

FOLLOW-UP

Repeat wet film and culture in 7 – 10 days

ANOGENITAL CANDIDIASIS

AETIOLOGY

Candida albicans 80 – 92%

Non-albicans species eg. *C.glabrata*

PRESENTATION

Female

- Vulval itching & soreness
- Thick white curdy vaginal discharge that is worse before menses ± dyspareunia and ± dysuria

Male

- Rash on glans penis
- Penile soreness/itch

FINDINGS

Female

- Vulval erythema with satellite lesions
- Fissures at perineum
- Thick white curdy vaginal discharge

Male

- Erythema over glans penis
- Fissures over prepuce
- Oedema of prepuce
- Phimosis

INVESTIGATIONS

- Lateral wall of vagina/subpreputial smear
 - 10% KOH microscopy (sensitivity 70%)
 - Gram stain for Gram-positive yeast-like cells (sensitivity 65 – 68%)
 - Saline wet mount (sensitivity 40 – 60%)
- Culture on Saboraud's media
- Vaginal pH 4 – 4.5

TREATMENT

Topical and oral azole therapies (Cure rate 80 – 95%)

RECOMMENDED

Topical Therapy

- Clotrimazole pessaries 200 mg daily for 3 nights or
- Clotrimazole pessaries 500 mg single dose

ALTERNATIVE

Topical Therapy

- Nystatin pessaries 100,000 units nocte for 2 weeks or
- Tioconazole pessaries 200 mg daily for 3 days or
- Tioconazole 6.5% ointment 5 g intravaginally-single application

Oral Therapy

- Fluconazole 150 mg single dose P.O.
- Itraconazole 200 mg b.d. P.O. for 1 day

Pregnancy

- Topical therapies recommended for a longer period

ADVICE

- Avoid local irritants e.g. perfumes
- Avoid tight fitting synthetic clothing

CONTACT TRACING

• Evidence to support epidemiological treatment of asymptomatic male sexual partners

FOLLOW-UP

- 7 – 14 days after completion of therapy
- Repeat vaginal smear for candida

RECURRENT VAGINAL CANDIDIASIS

- 4 or more episodes of symptomatic candidiasis annually
- Predisposing factors: diabetes mellitus, HIV infection, corticosteroid use, frequent broad spectrum antibiotic use

TREATMENT

Recommended

- Fluconazole 100 mg P.O. weekly for 6 months or
- Clotrimazole vaginal pessary 500 mg weekly for 6 months or
- Itraconazole 400 mg P.O. monthly for 6 months

BACTERIAL VAGINOSIS / ANAEROBIC VAGINOSIS

AETIOLOGY

- Bacterial Vaginosis (BV) is a polymicrobial clinical syndrome resulting from replacement of the normal hydrogen peroxide – producing *Lactobacillus* sp. in the vagina with high concentrations of anaerobic bacteria (e.g., *Prevotella* sp. and *Mobiluncus* sp.), *Gardnerella vaginalis*, and *Mycoplasma hominis*
- Is not a STI but frequently detected during STI screening

PRESENTATION

- Abnormal vaginal discharge with a strong fish-like odour, especially after sexual intercourse
- Dysuria and / or itching around the outside of the vagina
- 50% of women with BV are asymptomatic

FINDINGS

- Discharge, if present, is usually homogeneous thin, white or grey, uniformly adherent
- Inflammation of the vaginal wall is absent

INVESTIGATIONS

Using the Amsel's criteria, diagnosis is made by the presence of any 3 out of the 4 features given below :

- Homogeneous, thin, white discharge that smoothly coats the vaginal walls
- Presence of clue cells on microscopic examination
- pH of vaginal fluid >4.5
- Fishy odor of vaginal discharge before or after addition of 10% KOH (the 'Amine' Sniff test)

An alternative is to use a Gram stained vaginal smear, with the Hay/Ison criteria or the Nugent criteria. The Hay/Ison criteria is 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 (Bacterial Vaginosis): Predominantly *Gardnerella* and/or *Mobiluncus* morphotypes. Few or absent *Lactobacilli*

The Nugent score is derived from estimating the relative proportions of *Lactobacilli* and bacterial vaginosis morphotypes to give a score of between 0 and 10. A score of < 4 is normal, 4 to 6 intermediate, and > 6 indicates bacterial vaginosis.

TREATMENT

Treatment is indicated for:

- Symptomatic women
- Women undergoing gynecological procedures
- Pregnant women

Recommended

- Metronidazole 400 mg b.d. P.O. for 5 to 7 days or
- Metronidazole 2 g single dose P.O.

Alternative

- Intravaginal metronidazole 0.75% gel once daily for 5 days or
- Intravaginal clindamycin 2% cream once daily for 7 days or
- Clindamycin 300 mg b.d. P.O. for 7 days

Allergy

Use 2% clindamycin cream for metronidazole allergic women.

Pregnancy and Breastfeeding

BV during pregnancy is associated with adverse pregnancy outcomes:

- Premature rupture of the membranes
- Preterm labour
- Preterm birth

- Chorioamnionitis
- Postpartum endometritis

Meta-analyses have concluded that there is no evidence of teratogenicity from the use of metronidazole in women during the first trimester of pregnancy.

ADVICE:

Patients should be advised to avoid vaginal douching.

CONTACT TRACING

Routine screening and treatment of male partners are not indicated.

FOLLOW - UP

- A test of cure is not required if symptoms resolve
- If treatment is prescribed in pregnancy to reduce the risk of preterm birth, a repeat test should be made after 1 month and further treatment is offered if there is evidence of recurrence of bacterial vaginosis

GRANULOMA INGUINALE (DONOVANOSIS)

AETIOLOGY

Klebsiella (Calymmatobacterium) granulomatis

Endemic in Western Guinea, South America, the Caribbean, Southeast India and aboriginal population in Australia.

INCUBATION PERIOD: 1-4 weeks (up to 6 months)

PRESENTATION / FINDINGS

Present initially as a single or multiple painless nodules or papules which erode to form beefy exuberant, granulomatous ulcers with rolled and elevated border, usually painless, bleeds easily and enlarge slowly. May autoinnoculate to form kissing lesions. May form **pseudobuboes** on the inguinal area.

May present as hypertrophic or necrotic lesions.

Complications include haemorrhage, genital lymphoedema, genital mutilation and cicatrization. Squamous cell carcinoma may complicate the presentation.

INVESTIGATIONS

- Tissue smears to look for bipolar staining rod-like bacilli resembling safety pins (Donovan's bodies) with Wright or Giemsa stain. Silver stains have a high sensitivity
- Tissue biopsy
- PCR studies from tissue
- Tests to exclude other causes of genital ulcers

TREATMENT

Recommended

- Azithromycin 1g P.O. once a week for 4 weeks or 500mg daily for 7 days

Alternative

- Cotrimoxazole 2 tabs b.d. P.O. for 2-3 weeks or
- Ceftriaxone 1 g daily I.M. or I.V. for 2-3 weeks or
- Erythromycin 500 mg q.i.d. P.O. for 2-3 weeks or
- Doxycycline 100 mg b.d. P.O. for 2-3 weeks

Gentamycin 1mg/kg 8hourly I.M. or I.V. is used as an adjunct treatment if the above regimens do not give a satisfactory response after a few days.

Treatment should be continued until lesions have healed.

Pregnancy

Erythromycin is recommended.

Infants born to mothers with untreated genital lesions are at risk of infection and a course of prophylactic antibiotics should be considered.

CONTACT TRACING

Sexual partners must be screened and treated

FOLLOW-UP

Weekly till ulcers have healed

CHANCROID

AETIOLOGY

Haemophilus ducreyi

INCUBATION PERIOD : 3 to 10 days

PRESENTATION / FINDINGS

Divided into those at site of primary inoculation and at regional lymph nodes.

At the site of primary inoculation

In males, ulcers are found on the prepuce near the frenulum or in the coronal sulcus. In females, ulcers are found at the entrance to the vagina, particularly the fourchette.

The ulcers are classically described as:

- Multiple, painful
- Not indurated (“soft sore”)
- With a necrotic base and purulent exudate
- Bordered by ragged undermined edges
- Bleeds easily on contact

At the regional lymph nodes

- Painful unilateral inguinal adenitis is a characteristic feature (50%), leading to the formation of buboes.
- Buboes are fluctuant and may rupture, releasing thick pus, and may result in extensive ulceration.

INVESTIGATIONS

- **PCR** (>95% sensitivity)
- **Gram stain** of scrapings from the ulcer base or pus aspirated from the bubo
 - Gram negative coccobacilli, with characteristic appearance (“school of fish”)
- **Culture**
 - Specimen plated directly in the clinic or sent within 4 hours to the laboratory using a transport medium. Calcium alginate or plastic swabs should be used for sample collection.

- Screening for other possible causes of genital ulcers:
 - *Treponema pallidum*
 - Genital herpes
 - Lymphogranuloma venereum (LGV)
 - Donovanosis
 - HIV
 - Neoplasia

TREATMENT

Recommended

- Azithromycin 1 g single dose P.O. or
- Ceftriaxone 250 mg single dose I.M. or
- Ciprofloxacin 500 mg b.d. P.O. for 3 days or
- Erythromycin base 500 mg q.i.d. P.O. for 7 days

Alternative

- Spectinomycin 2 g single dose I.M.

Epidemiological Treatment

Sexual contacts within 10 days before onset of the patient's symptoms should be examined and treated even in the absence of symptoms, as asymptomatic carriage of *H. ducreyi* is not uncommon.

Special considerations

- Management of fluctuant buboes
 - Needle-aspirate fluctuant buboes from adjacent healthy skin. Is simpler and safer than incision, which is prone to sinus formation.
- Treatment of pregnant or lactating mothers and children
 - The safety of azithromycin for pregnant and lactating women has not been established.
 - Ciprofloxacin is contraindicated for pregnant and lactating women, children, and adolescents less than 18 years of age.
 - The erythromycin or ceftriaxone regimens should be used.
 - No adverse effects of chancroid on pregnancy outcome or on the fetus have been reported.

- HIV patients
 - Healing of ulcer may be slower with a high rate of treatment failure
 - Ceftriaxone and azithromycin regimens should be used among persons known to be infected with HIV only if follow-up can be assured

ADVICE

- Patients should be advised to avoid unprotected sexual intercourse until they and their partner/s have completed treatment and follow-up.
- Patients and partner/s should be given a detailed explanation of the condition with particular emphasis on the long-term implications to their health. This should be reinforced by giving them clear and accurate written information.

FOLLOW-UP

- Patients should be re-examined 3-7 days after initiation of therapy.
- If treatment is successful, ulcers improve symptomatically within 3 days and substantial re-epithelization occurs within 7 days after onset of therapy.
- The time required for complete healing is related to the size of the ulcer (and perhaps HIV); large ulcers may require more than 2 weeks.
- Treatment failure:
 - Investigate for possible co-infections with *T. pallidum* or HSV
 - Determine possible resistance by isolation of *H. ducreyi* and susceptibility testing
 - Clinical resolution of fluctuant lymphadenopathy is slower than that of ulcers and may require frequent needle aspiration (or drainage)

LYMPHOGRANULOMA VENEREUM

(LGV, also known as Lymphogranuloma inguinale, lymphopathia venerum or Duran-Nicholas-Favre's disease)

AETIOLOGY

- *Chlamydia trachomatis* of either serovars L1, L2 or L3
- Recently, there has been a resurgence of LGV in the West occurring mostly among HIV positive men who have sex with men (MSM)

INCUBATION PERIOD : 3 to 30 days

PRESENTATION / FINDINGS

There are three stages consisting of primary, secondary and tertiary lesions

Primary lesion

- Often transient and imperceptible
- Painless papule or pustule or shallow erosion found at the site of inoculation such as on the coronal sulcus of the penis in males, perianal region in MSM and on the posterior vaginal wall, fourchette, vulva or cervix in females
- Extra-genital lesions may be seen in the tonsil or extragenital lymph nodes

Secondary lesion

- Inguinal and/or femoral lymph nodes are involved, more commonly unilateral (2/3 cases)
- One lymph node or an entire chain of lymph nodes may be involved
- Bubo formation that occurs may be complicated by ulceration, purulent discharge and formation of chronic fistula
- Involvement of inguinal and femoral lymph nodes separated by the inguinal ligament forms the classical "groove sign" (15-20%)
- Systemic spread is associated with fever, arthritis, pneumonitis and more rarely hepatitis

Tertiary or the Genito-ano-rectal syndrome

- Vast majority recover after the secondary stage without any sequelae
- A few may develop proctitis, or acute proctocolitis mimicking Crohn's disease
- Women may develop fistulae, strictures and chronic granulomatous disfiguring lesions of the vulva
- Long term infection may result in lymphoedema of the genitalia (elephantiasis)

INVESTIGATIONS

- Exclude other causes of genital ulcers and inguinal lymphadenopathy
- Specimens for specific diagnosis include an ulcer/ bubo/ urethral/ cervical swabs or urine
- Laboratory tests include:
 - PCR
 - Cell culture
 - *C. trachomatis* serology
 - Antigen detection using Direct Immunofluorescence (DIF)

TREATMENT

Recommended

- Doxycycline 100 mg b.d. P.O. for 21 days or
- Erythromycin 500 mg q.i.d. P.O. for 21 days

Alternative

- Minocycline 300 mg loading dose followed by 200 mg b.d. P.O. or
- Azithromycin 1 g daily P.O. for 2-3 weeks

Epidemiological Treatment

- Sexual contacts within 30- 60 days before onset of the patient's symptoms should be tested for rectal, urethral or cervical chlamydial infection
- Treat presumptively with azithromycin 1g single dose P.O. or doxycycline 100 mg b.d. P.O. for 7 days

Patients with known allergy to tetracycline and pregnant mothers should be treated with erythromycin. Patients with HIV infection should be treated with the same antibiotics but a longer duration may be required.

ADVICE

- Patients should be given a detailed explanation of their condition and the long term implications to their health and their partner/s.
- Unprotected sexual intercourse should be avoided until the patients and their partner/s have completed treatment and follow-up.

FOLLOW-UP

- Patients should be followed up until their signs and symptoms have resolved (within 3 - 6 weeks).
- Fibrotic lesions and fistulae may need reconstructive genital surgery.

SYNDROMIC APPROACH TO STI MANAGEMENT

In 1991, WHO endorsed the syndromic approach because it was a new approach to managing STI cases and it works because it is simple, cost-effective and applicable at primary health care level where the majority of the people in the community live or work, rather than through specialized health services.

The syndromic approach to STI case management is management of STIs according to their clinical presentation. The main infectious agents are grouped according to clinical syndromes they cause and patients treated for all the important causes of a syndrome.

In the year 2000, the Malaysian Government identified 3 syndromes for local use at the primary health care level, which included urethral discharge, vaginal discharge and genital ulcer.

Algorithms were based on WHO recommendations and adapted for local use. Some elements of laboratory investigations and follow-up and counseling were incorporated into the management of the 3 syndromes.

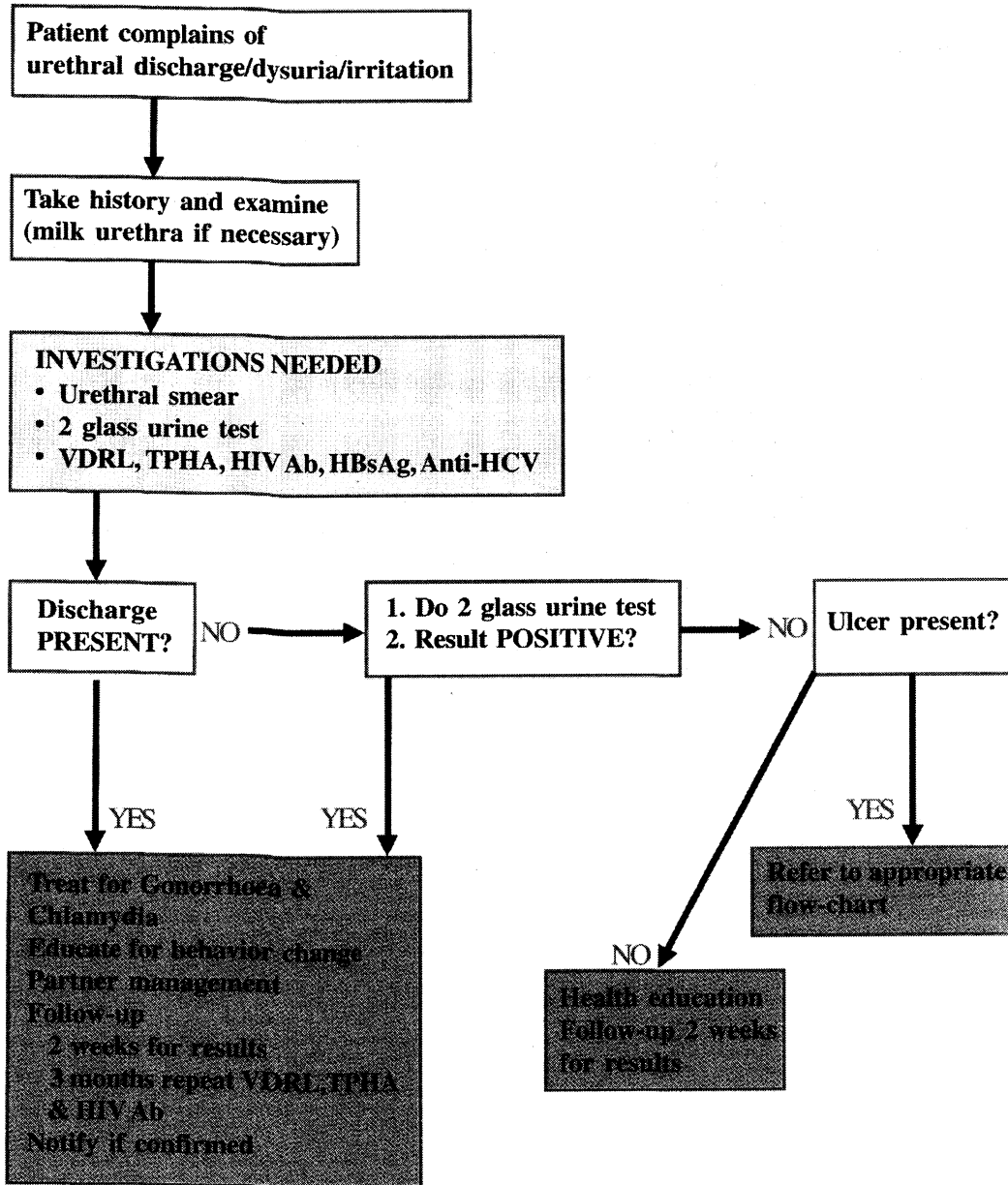
Once patients come to a health care facility with a suspected STI, health care workers can use the syndromic approach to provide treatment quickly while using the most effective and standardized treatment regimens.

In addition, health care workers are encouraged to deliver effective health education aimed at improving patient compliance with therapy and at reducing the patients high risk behavior.

Three STI syndromes

Syndrome	Symptoms described by patients	Signs observed by providers	Most common cause
Vaginal discharge	Unusual vaginal disch Vaginal itching Dysuria Dyspareunia	Abnormal vaginal disch	VAGINITIS Trichomoniasis Candidiasis CERVICITIS Gonorrhoea Chlamydia
Urethral discharge	Urethral discharge Dysuria Frequent urination	Urethral discharge	Gonorrhoea Chlamydia
Genital ulcer	Genital sore	Genital ulcer Enlarged inguinal lymph nodes	Syphilis Chancroid HSV

URETHRAL DISCHARGE SYNDROME IN MEN



TREATMENT PROTOCOL FOR URETHRAL DISCHARGE SYNDROME

Treatment for Gonorrhoea and Chlamydia

First choice

IM ceftriaxone 250 mg single dose
plus
Azithromycin 1 gm single dose P.O.

Second choice

IM ceftriaxone 250 mg single dose
plus
Doxycycline 100 mg bd P.O. for 10-14 days

Third choice

IM ceftriaxone 250 mg single dose
plus
Erythromycin ES 800 mg qid P.O. for 10 - 14 days

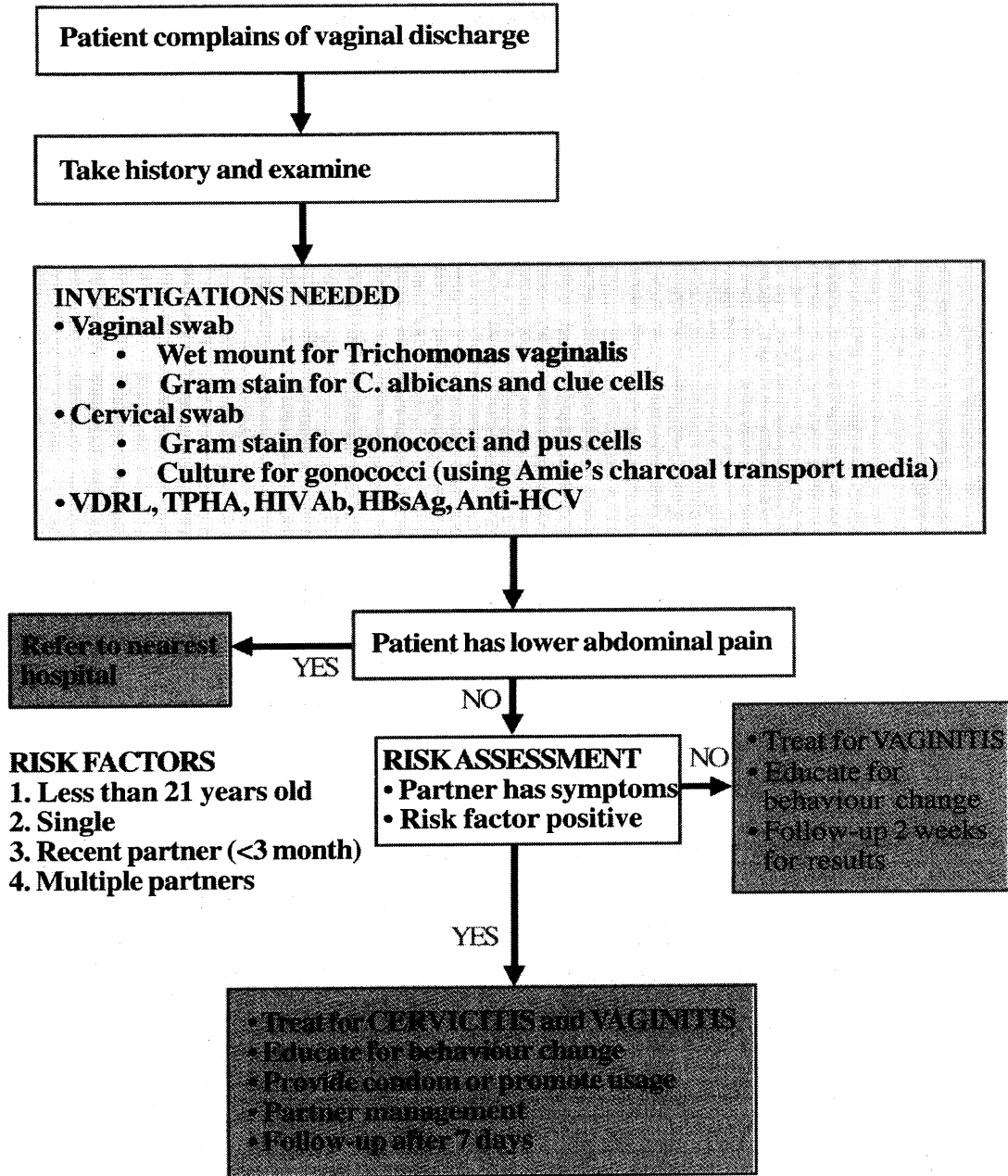
If Ceftriaxone and Azithromycin are not available

IM spectinomycin 2 gm stat
plus
Doxycycline 100 mg bd P.O. for 10 - 14 days

OR

IM spectinomycin 2 gm stat
plus
Erythromycin ES 800 mg qid P.O. for 10 - 14 days

VAGINAL DISCHARGE SYNDROME



**TREATMENT FOR VAGINAL DISCHARGE SYNDROME
(CERVICITIS AND VAGINITIS)**

Treatment for cervicitis

First choice

IM ceftriaxone 250 mg single dose
plus
Azithromycin 1 gm orally single dose P.O.

Second choice

IM ceftriaxone 250 mg single dose
plus
Doxycycline 100 mg bd P.O. for 10 - 14 days

Third choice

IM ceftriaxone 250 mg single dose
plus
Erythromycin ES 800 100 mg bd P.O. for 10 - 14 days

PLUS

Treatment for vaginitis

Metronidazole 2 gm stat

plus

Nystatin pessaries 100,000 units daily for 14 days OR

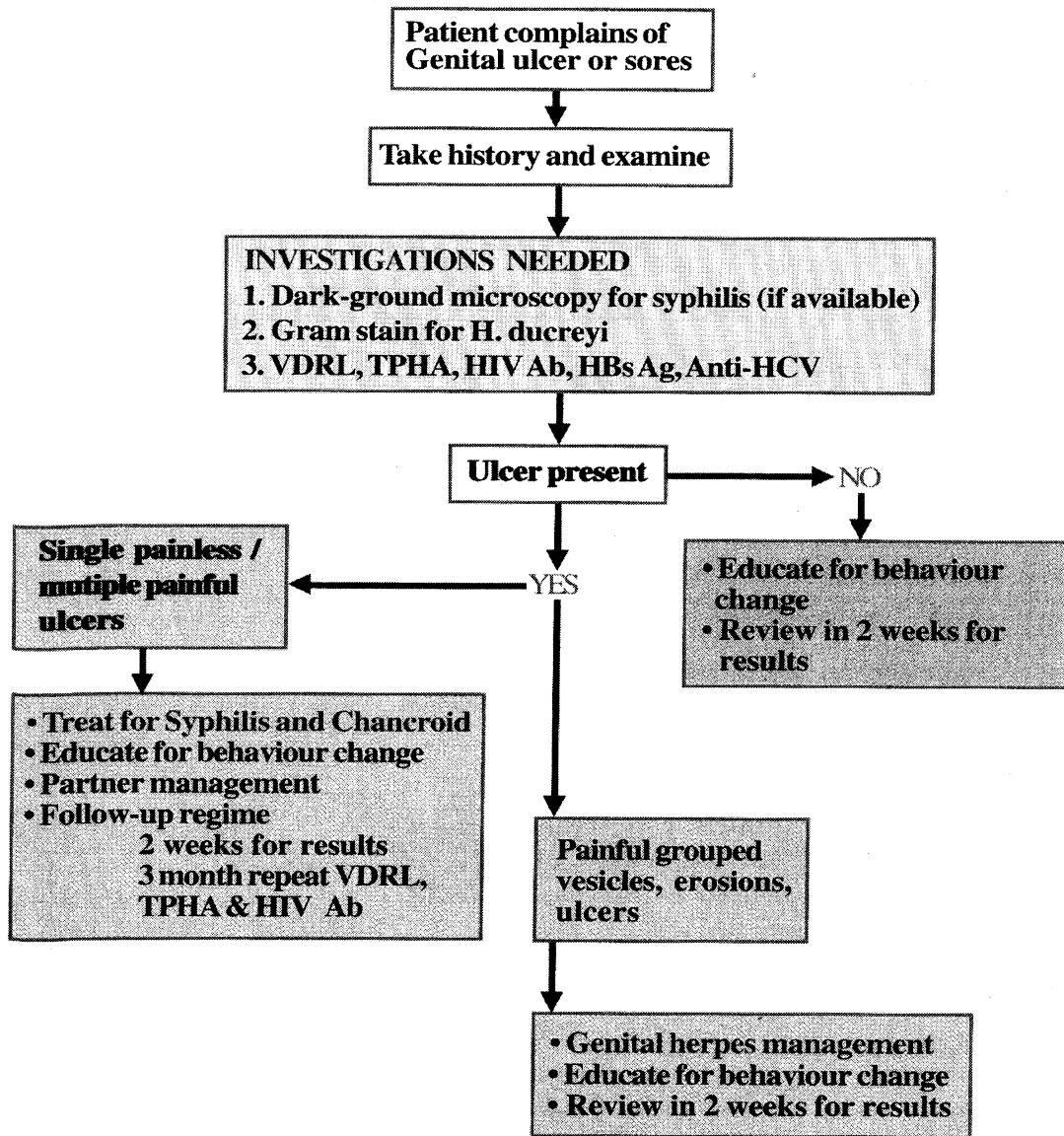
Clotrimazole pessaries 200mg daily for 3 days OR 500mg single dose

Follow-up

if no improvement or not effective
to continue Metronidazole 400 mg bd X 7 days

OR Treat for vaginitis only

GENITAL ULCER SYNDROME



TREATMENT PROTOCOL FOR GENITAL ULCER SYNDROME

Treatment for syphilis and chancroid

First choice

IM Benzathine penicillin 2.4 million units weekly X 2 (once a week X 2 weeks)
plus
Azithromycin 1.0 gm single oral dose

Second choice

IM Benzathine penicillin 2.4 million units weekly X 2 (once a week X 2 weeks)
plus
IM Ceftriaxone 250 mg single dose

NOTE If patient develops allergic reaction to the 1st dose of IM benzathine penicillin, do not give the second dose

If patient allergic to penicillin, use EITHER
Doxycycline 100 mg bd P.O. for 14 days OR
Erythromycin ES 800 mg qid P.O. for 14 days

Doxycycline should not be used during pregnancy or lactation
Babies of mothers who are treated with Erythromycin must be treated for syphilis

Treatment for genital herpes

Refer to guidelines on genital herpes

ABBREVIATIONS

Ab	Antibody
Ag	Antigen
AIDS	Acquired Immunodeficiency Syndrome
Anti-HCV	Hepatitis C antibodies
BASHH	British Association for Sexual Health and HIV
BV	Bacterial Vaginosis
CDC	Centers for Disease Control and Prevention
CIN	Cervical Intraepithelial Neoplasia
CMI	Cell-mediated Immunity
CNS	Central Nervous System
CS	Caesarian Section
CSF	Cerebrospinal fluid
DIF	Direct Immunofluorescent Assay
DFA	Direct Fluorescent Antibody
DGI	Disseminated Gonococcal Infection
DNA	Deoxyribonucleic acid
EB	Elementary Bodies
EIA	Enzyme immunoassay
ELISA	Enzyme-linked immunosorbent assay
EPT	Expedited partner therapy
FBC	Full Blood Count
FDA	Food and Drug Administration
FTA-ABS	Fluorescent treponemal antibody absorption
GC	Gonococcus
GH	Genital Herpes
GU	Genito-urinary
HAART	Highly Active Antiretroviral Therapy
HBsAg	Hepatitis B surface Antigen
HBV	<i>Hepatitis B virus</i>
HCV	<i>Hepatitis C virus</i>
HIV	<i>Human immunodeficiency virus</i>
HPV	<i>Human papilloma virus</i>
HSV	<i>Herpes simplex virus</i>
IFA	Immunofluorescent assay
Ig	Immunoglobulin
I.M.	Intramuscular
IUD	Intrauterine device

I.V.	Intravenous
KOH	Potassium hydroxide
LGV	Lymphogranuloma venereum
MMWR	Morbidity and Mortality Weekly Report
MSM	Men who have sex with men
NAAT	Nucleic acid amplification test
NGU	Nongonococcal urethritis
NSU	Nonspecific urethritis
NSGI	Nonspecific genital infection
Pap	Papanicolaou
PCR	Polymerase chain reaction
PID	Pelvic Inflammatory Disease
P.O.	Per oral/ by mouth
QOL	Quality of life
QRNG	Quinolone resistant <i>Neisseria gonorrhoeae</i>
RB	Reticulate bodies
RNA	Ribonucleic acid
RPR	Rapid Plasma Reagin
SARA	Sexually acquired reactive arthritis
STD	Sexually transmitted disease
STI	Sexually transmitted infection
TCA	Trichloroacetic acid
TPHA	<i>Treponema pallidum</i> haemagglutination
TPPA	<i>Treponema pallidum</i> particle agglutination
VDRL	Venereal Disease Research Laboratory
VZV	Varicella zoster virus
WBC	White blood cell
WHO	World Health Organization
WSW	Women who have sex with women

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