NATIONAL CLINICAL GUIDELINES

THE DIAGNOSIS & MANAGEMENT OF SEXUALLY TRANSMITTED INFECTIONS

Ministry of Public Health

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المبادئ الإرشادية السريرية لدولة قطر
NATIONAL CLINICAL GUIDELINES FOR QATAR

وزارة الصحـــــة العامـــــة
Ministry of Public Health
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Abbreviations

The abbreviations used in this guideline are as follows:

CT	Computed Tomography
C. trachomatis	*Chlamydia trachomatis*
CIA	Chemiluminescence Immunoassay
DFA	Direct Immunofluorescence Assay
FTA-ABS	Fluorescent Treponemal Antibody Absorption
HAV	Hepatitis A Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
HSV	Herpes Simplex Virus
IM	Intramuscular Administration
IV	Intravenous Administration
LGV	Lymphogranuloma Venereum
M. genitalium	*Mycoplasma genitalium*
MRI	Magnetic Resonance Imaging
MSM	Men Who Have Sex with Men
N. gonorrhoeae	*Neisseria gonorrhoeae*
NAAT	Nucleic Acid Amplification Test
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs

PCR	Polymerase Chain Reaction
PID	Pelvic Inflammatory Disease
PO	Oral Administration
RPR	Rapid Plasma Reagin
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
T. pallidum	*Treponema pallidum*
T. vaginalis	*Trichomonas vaginalis*
TOC	Test-Of-Cure
TP-EIA	*Treponema pallidum* Enzyme Immunoassay
TPHA	*Treponema pallidum* Hemagglutination Assay
TPPA	*Treponema pallidum* Particle Agglutination Assay
TRUST	Toluidine Red Unheated Serum Test
UGTI	Upper Genital Tract Infection
VDRL	Venereal Disease Research Laboratory

View Pathway

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1 Information about this Guideline

1.1 Objective and Purpose of the Guideline

The purpose of this guideline is to define the appropriate diagnosis, and management of sexually transmitted infections. The objective is to guide the appropriate investigation, treatment and referral of patients presenting to provider organisations in Qatar. It is intended that the guideline will be used primarily by healthcare professionals in primary care and outpatient settings.

1.2 Scope of the Guideline

This guideline covers the following aspects of care:

- STI Prevention.
- Diagnosis and Management in by causative organisms, including:
  - Gonorrhoea.
  - Syphilis.
  - Chlamydia.
  - Chancroid.
  - Donovanosis.
  - Lymphogranuloma Venereum.
  - Mycoplasma Genitalium.
  - Trichomoniasis.
  - Genital Warts.
  - Genital Herpes Simplex.
- Diagnosis and Management by Syndromic Presentation, including:
  - Urethritis in Males.
  - Cervicitis.
  - Vaginal discharge.
  - Genital ulcer disease.
  - Pelvic Inflammatory Disease.
  - Epididymitis and Epididymo-Orchitis

1.3 Editorial Approach

This guideline document has been developed and issued by the Ministry of Public Health of Qatar (MOPH), through a process which aligns with international best practice in guideline development and localisation. The guideline will be reviewed on a regular basis and updated to incorporate comments and feedback from stakeholders across Qatar.

The editorial methodology, used to develop this guideline, has involved the following critical steps:

- Extensive literature search for well-reputed, published evidence relating to the topic.
- Critical appraisal of the literature.
- Development of a draft summary guideline.
- Review of the summary guideline with a Guideline Development Group, comprised of practising healthcare professionals, subject matter experts and patient representatives, from across Qatar.
- Independent review of the guideline by the National Clinical Guidelines & Pathways Committee, appointed by the MOPH, from amongst stakeholder organisations across Qatar.

Whilst the MOPH has sponsored the development of the guideline, the MOPH has not influenced the specific recommendations made within it.

1.4 Sources of Evidence

The present National Clinical Guideline was developed based on an unpublished document developed by the Public Health Department of the Ministry of Public Health. The document has been used as a guide to current clinical practice processes in Qatar and has been supplemented with other relevant studies.

The professional literature published in the English language has been systematically queried using specially developed, customised, and tested search strings. Search strategies are developed to allow efficient yet comprehensive analysis of relevant publications for a given topic and to maximise retrieval of articles with certain desired characteristics pertinent to a guideline.

For each guideline, all retrieved publications have been individually reviewed by a clinical editor and assessed in terms of quality, utility, and relevance. Preference is given to publications that:

1. Are designed with rigorous scientific methodology.
2. Are published in higher-quality journals (i.e. journals that are read and cited most often within their field).
3. Address an aspect of specific importance to the guideline in question.

Further information about the literature search and appraisal process is included in the appendix.

1.5 Evidence Grading and Recommendations

Recommendations made within this guideline are supported by evidence from the medical literature and where possible the most authoritative sources have been used in the development of this guideline. In order to provide insight into the evidence basis for each recommendation, the following evidence hierarchy has been used to grade the level of authoritativeness of the evidence used, where recommendations have been made within this guideline.

Where the recommendations of international guidelines have been adopted, the evidence grading is assigned to the underlying evidence used by the international guideline. Where more than one source has been cited, the evidence grading relates to the highest level of evidence cited:

- **Level 1 (L1):**
  - Meta-analyses.
  - Randomised controlled trials with meta-analysis.
  - Randomised controlled trials.
  - Systematic reviews.

- **Level 2 (L2):**
  - Observational studies, examples include:
    - Cohort studies with statistical adjustment for potential confounders.
    - Cohort studies without adjustment.
    - Case series with historical or literature controls.
    - Uncontrolled case series.
  - Statements in published articles or textbooks.

- **Level 3 (L3):**
    - Expert opinion.
    - Unpublished data, examples include:
        - Large database analyses.
        - Written protocols or outcomes reports from large practices.

In order to give additional insight into the reasoning underlying certain recommendations and the strength of recommendation, the following recommendation grading has been used, where recommendations are made:

- **Recommendation Grade A (RGA):** Evidence demonstrates at least moderate certainty of at least moderate net benefit.
- **Recommendation Grade B (RGB):** Evidence is insufficient, conflicting, or poor and demonstrates an incomplete assessment of net benefit vs harm; additional research is recommended.
- **Recommendation Grade C (RGC):** Evidence demonstrates potential harm that outweighs benefit; additional research is recommended.
- **Recommendation of the GDG (R-GDG):** Recommended best practice based on the clinical experience of the Guideline Development Group members.

1.6 Guideline Development Group members

The following table lists members of the Guideline Development Group (GDG) nominated by their respective organisations and the Clinical Governance Group. The GDG members have reviewed and provided feedback on the draft guideline relating to the topic. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

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1.7 National Clinical Guidelines & Pathways Committee members

The following table lists members of the National Clinical Guidelines & Pathways Committee (NCGPC), appointed by the MOPH. The NCGPC members have reviewed and provided their feedback and approval of the guideline document. Each member has completed a declaration of conflicts of interest, which has been reviewed and retained by the MOPH.

National Clinical Guidelines & Pathways Committee (NCGPC) Members		
Name	**Title**	**Organisation**
Ms Huda Amer Al-Katheeri	Chair of the NCGPC, Director of Strategic Planning & Performance Department	Ministry of Public Health
Shk Dr Mohammed Hamad J. Al Thani	Co-Chair of the NCGPC, Director of Public Health	Ministry of Public Health

National Clinical Guidelines & Pathways Committee (NCGPC) Members		
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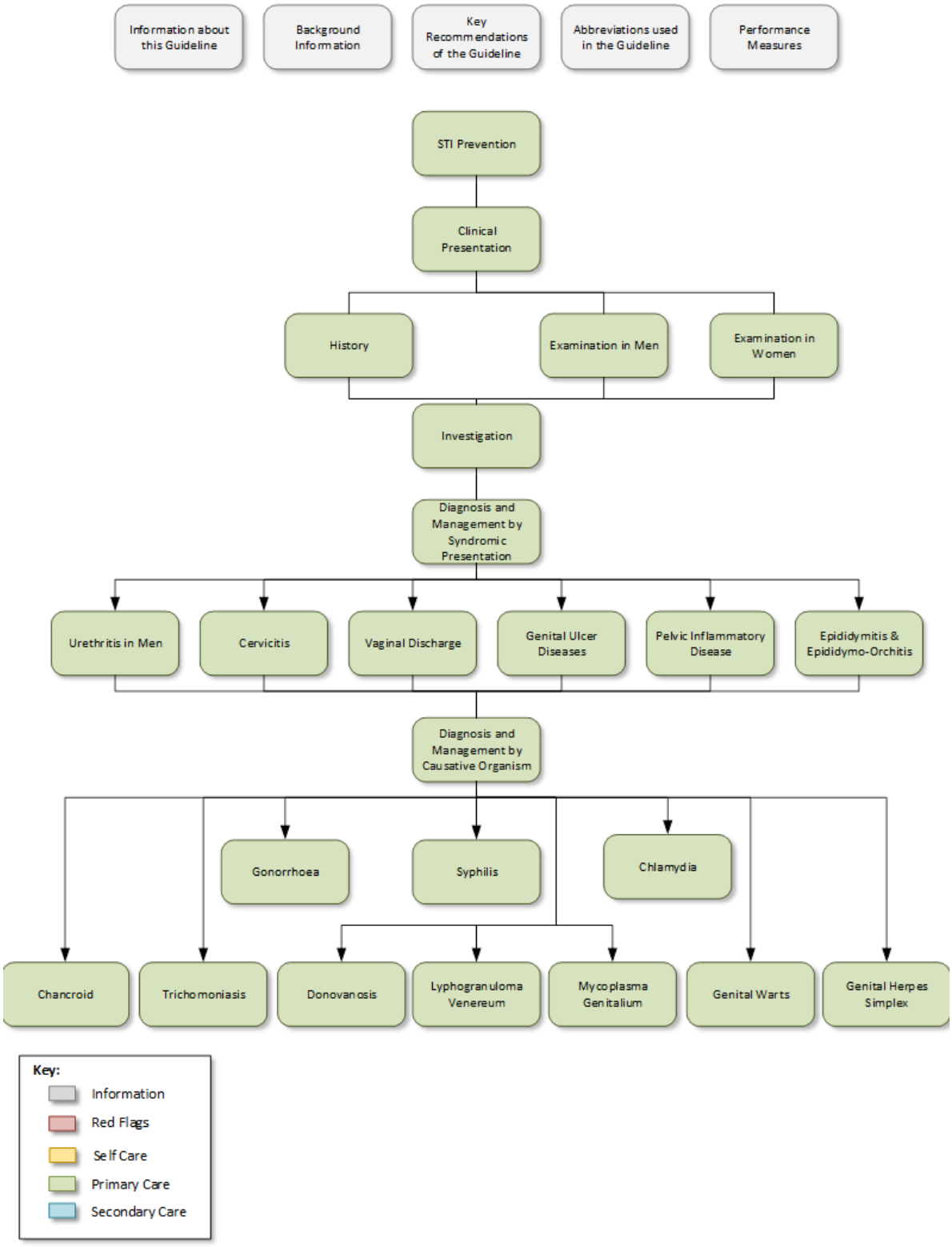
1.8 Responsibilities of Healthcare Professionals

This guideline has been issued by the MOPH to define how care should be provided in Qatar. It is based upon a comprehensive assessment of the evidence as well as its applicability to the national context of Qatar. Healthcare professionals are expected to take this guidance into account when exercising their clinical judgement in the care of patients presenting to them.

The guidance does not override individual professional responsibility to take decisions which are appropriate to the circumstances of the patient concerned. Such decisions should be made in consultation with the patient, their guardians, or carers and should consider the individual risks and benefits of any intervention that is contemplated in the patient's care.

2 STIs Pathway

Click on a box below to see the relevant page of the Pathway.



3 Key Recommendations of the Guideline

The key recommendations of this guideline are:

STI Prevention (*Section 5*):

- The comprehensive approach to STI prevention is based on five major strategies [1] [**L1, RGA**]:
  - Accurate risk assessment, with education and counselling of at-risk individuals on ways to avoid STIs.
  - Pre-exposure vaccination of individuals at risk for vaccine-preventable STIs.
  - Identification of both asymptomatic and symptomatic individuals with STIs.
  - Effective diagnosis, treatment, counselling, and follow-up of infected individuals.
  - Evaluation, treatment, and counselling of sexual partners of infected individuals.
- As part of the clinical encounter, healthcare providers should routinely obtain sexual histories from their patients and address risk reduction[1] [**L1, RGA**].
- Screening for STIs depends on the individual's risk factors (see *Section 4.4*) [6].
- Routine laboratory screening should be considered for sexually active adolescents and pregnant women [1] [**L1, RGA**].
- Routine screening for certain STIs (e.g. syphilis, trichomoniasis, bacterial vaginosis, HSV, human HPV, hepatitis A virus (HAV), and hepatitis B virus (HBV)) is not recommended in asymptomatic adolescents [1,10,11] [**L1, RGB**] but may be considered in patients who are at increased risk for infection [11] [**L1, RGA**].
- Vaccination is an important strategy to prevent several infections that are sexually transmitted or associated with sexual activity [1] [**L1, RGA**]. See Section 5.3 for details on vaccinations to be offered to different patient groups.

Clinical Assessment (*Section 6*):

- Most common symptoms of STIs include but are not limited to [16]:
  - Dysuria.
  - Genital skin problems.
  - Unusual vaginal discharge.
  - Unusual or a change in vaginal bleeding (including post-coital and inter-menstrual bleeding).
  - Urethral discharge.
  - Abdominal pain or deep dyspareunia.
  - Testicular discomfort or swelling.
  - Peri-anal or anal symptoms.
- More clinical features and symptoms that can be used to recognise and diagnose specific STIs are listed in respective sections under the Management (see *Sections 8 and 9*).
- See *Sections 6.2* and *6.3* for detailed information on appropriate history taking and examination.

Investigation (*Section 7*):

- All laboratories conducting STI tests should follow a quality improvement programme if not accredited nationally or internationally to ensure that all reports produced by the laboratory are of high quality [21] [**L1, RGA**].
- The minimum tests that in combination constitute an STI check (an STI screen) are those for [14] [**L1**]:
  - Chlamydia.
  - Gonorrhoea.
  - Syphilis.
  - HIV.

- If unsure, consider seeking specialist advice and assistance in the interpretation of results [**R-GDG**].

Diagnosis and Management of STIs by Causative Organism (*Section 8*):

- Refer to Section 8 for detailed information on the investigation, diagnosis and treatment of the following STIs by the causative organism:
    - Gonorrhoea.
    - Syphilis.
    - Chlamydia.
    - Chancroid.
    - Donovanosis.
    - Lymphogranuloma Venereum.
    - Mycoplasma Genitalium.
    - Trichomoniasis.
    - Genital Warts.
    - Genital Herpes Simplex.

Diagnosis and Management of Urethritis in Males (*Section 9.1*):

- Urethritis should be specified as either gonococcal or non-gonococcal urethritis (NGU) [1].
- The following basic tests recommended for the diagnosis [1,39]:
    - First pass urine for NAAT if dysuria is present.
    - Urethral swab for microscopy and culture, if any discharge or a urethral swab can be collected.
- Additional tests may be considered in MSM patients [22] [**L2**]:
    - Rectal swabs and culture for chlamydia and gonorrhoea.
    - Throat swab and culture for gonorrhoea.
    - Blood test for syphilis, HIV, HAV and HBV.
    - Consider testing for HCV, if:
        - There is a history of injecting drug use.
        - Patient is HIV positive.
- Men who receive a diagnosis of NGU should be tested for HIV and syphilis [1].
- Patients with urethritis and their sexual partners referred for evaluation, should receive the appropriate treatment when required (see *Table 9.1.4*) [1,39] [**L1, RGA**].
- Sexual partners of patient with confirmed gonorrhoea and chlamydia should be traced [22] [**L2**].
- All sexual partners of men with non-gonococcal urethritis within the preceding 60 days should be referred for evaluation, testing, and presumptive treatment regardless of symptoms or signs [1,5] [**L1**].

Diagnosis and Management of Cervicitis (*Section 9.2*):

- Cervicitis is an inflammation of the cervix defined clinically by the presence of cervical ectopy and/or a friable cervix with easily induced bleeding at the cervical os and/or mucopurulent discharge at the cervical os [1,5,22].
- Possible causative pathogens include [1,2,22]:
    - Most common:
        - *C. trachomatis.*
        - *N. gonorrhoeae.*
    - Less common:
        - *M. genitalium.*
        - *T. vaginalis.*
        - HSV.

- Cervicitis is frequently asymptomatic but the following two symptoms may be presented in some patients [1,2,6,22]:
    - Vaginal discharge:
    - Intermenstrual or post-coital vaginal bleeding.
- Speculum examination to view cervix should be performed [5,22] [**L1, RGA**].
- A cervical swab is the minimal diagnostic test required for cervicitis [**R-GDG**].
- It is not always possible to identify a pathogen in women with cervicitis, who are at low risk of STIs [22]. In such patients, cervicitis may be due to exposure to chemical irritants (e.g. spermicides or deodorants).
- Women with cervicitis should be tested for HIV and syphilis [1].
- If cervicitis is found incidentally on vaginal examination (e.g. PAP smear), consider testing for other STIs, especially in patients from a high risk group[1,22].
- Treatment at initial assessment is recommended in women with cervicitis who are at increased risk for STIs (see *Table 9.2.4*) even if a pathogen have not been yet identified [22] [**L2, RGA**].
- Advise sexually active patients to avoid sexual contact for 7 days after treatment or until they and their partner(s) are treated [1,22] [**L1, RGA**].
- Routine follow up is not required [22] [**L1, RGB**] but may be provided if another STI or symptoms of PID have been identified [22] [**L2, RGA**]. If PID diagnosed, assess response to antibiotics after 7 days [22] [**L1**].
- Patients with cervicitis due to chlamydia, gonorrhoea, or trichomoniasis should be tested for reinfection 3 months after treatment [1] [**L3, RGA**].

Diagnosis and Management of Vaginal Discharge (*Section 9.3*):

- Women of reproductive age may have normal physiological discharge [22].
- If an abnormal vaginal discharge is present, consider one of the following conditions:
- Bacterial vaginosis.
- Aerobic vaginitis.
- Candidiasis.
- **Sexually Transmitted Infections** [1,22,49]**:**
    - Gonorrhoea (see *Section 8.2*).
    - Chlamydia (see *Section 8.4*).
    - *M. genitalium* (see *Section 8.8*).
    - Trichomoniasis (see *Section 8.9*).
    - HSV (see *Section 8.11*).
- **Other Non-Infectious Causes** [1,22,49] (see *Section 9.3*).
- See detailed information on the diagnosis of causes of vaginal discharge based on clinical presentation in *Table 9.3.2*.
- See *Table 9.3.3* for detailed information on laboratory testing in patients with vaginal discharge.
- All patients with bacterial vaginosis should be tested for HIV and other STIs [1,22] [**L1**]. Treatment options should be selected based on the identified cause (see *Table 9.3.4*) [22].
- Probiotics are not currently recommended for the treatment of bacterial vaginosis [49] [**L1, RGB**].
- Advise sexually active patients to avoid sexual contact until they and their partner(s) are treated [**R-GDG**].
- See *Table 9.3.4* for detailed information on treatment of vaginal discharge according to the causative organism identified.
- Follow-up visits are not required for patients with non-STIs if symptoms resolve [1] [**L1**].

- If bacterial vaginosis was treated in pregnancy, the patient should be retested after 1 month and further treatment offered if required [49] [**L1, RGA**].

See *Section 9.4* for detail information on the **Diagnosis and Management of Genital Ulcer Disease.**
See *Section 9.5* for detail information on the **Diagnosis and Management of Pelvic Inflammatory Disease.**
See *Section 9.6* for detail information on the **Diagnosis and Management of Epididymitis and Epididymo -Orchitis.**

4 Background Information

4.1 Definition and Classification

The term sexually transmitted diseases (STDs) refers to a variety of clinical syndromes and infections caused by pathogens that can be acquired and transmitted through sexual activity[1]. STD is equivalent to STI (sexually transmitted infection).

STIs can be classified into two main categories [2]:

- Primary infections due to sexually transmitted pathogenic microorganisms.
- Infections caused by the patient's natural flora.

4.2 Aetiology

Sexually transmitted pathogens include [2]:

- Parasites:
  - *Trichomonas vaginalis (T. vaginalis).*
- Bacteria:
  - *Neisseria gonorrhoeae (N. gonorrhoeae).*
  - *Chlamydia trachomatis (C. trachomatis).*
  - *Haemophilus ducreyi.*
  - *Treponema pallidum (T. pallidum).*
- Viruses:
  - Herpes simplex virus (HSV).
  - Human papillomavirus (HPV).
  - Human immunodeficiency virus (HIV).

Bacterial vaginosis is caused by the disbalance of vaginal flora[2].

Genital infections caused by the following microorganisms are not sexually transmitted [2]:

- *Candida* spp.
- *Bacteroides fragilis*.
- Members of the family Enterobacteriaceae.

4.3 Prevalence

There is little information on the incidence and prevalence of STIs in Qatar. However, the problem of STIs is generally believed to be similar to that of other developing countries. According to preliminary data from the Ministry of Public Health, gonorrhoea and syphilis are the predominant STIs reported in Qatar [3].

Chlamydia is also a commonly reported communicable disease in Qatar. In 2008, the prevalence of *C trachomatis* was reported ~5% and was similar among Qatari and non-Qatari women [4].

4.4 Risk Factors

Behavioural risk factors include [3,5,6]:

- Sexually active before 25 years of age.
- New or multiple sexual partners.
- Sexual partners with recent STI.
- No or inconsistent condom use outside a monogamous sexual partnership.
- Sexual contact with sex workers.
- Victims of sexual assault/abuse.

Patients from the following populations are at increased risk for STIs and warrant specific considerations for screening and counselling [1,5,6]:

- Adolescents.
- Pregnant women.
- Human immunodeficiency virus (HIV)-infected individuals.
- Men who have sex with men (MSM).
- Transgender individuals.
- Sex workers.

4.5 Complications

Failure to diagnose and treat STI at an early stage may result in serious complications, including [7,8]:

- Chronic pelvic pain.
- Anogenital cancer.
- Infertility.
- Ectopic pregnancy.
- Miscarriage.
- Premature birth.
- Still birth.
- Congenital or neonatal infection.

The presence of STIs can facilitate HIV transmission[7,8].

5 STI Prevention

The comprehensive approach to STI prevention is based on five major strategies [1] [**L1, RGA**]:

1. Accurate risk assessment, with education and counselling of at-risk individuals on ways to avoid STIs.
2. Pre-exposure vaccination of individuals at risk for vaccine-preventable STIs.
3. Identification of both asymptomatic and symptomatic individuals with STIs.
4. Effective diagnosis, treatment, counselling, and follow-up of infected individuals.
5. Evaluation, treatment, and counselling of sexual partners of infected individuals.

As part of the clinical encounter, healthcare providers should routinely obtain sexual histories from their patients and address risk reduction[1] [**L1, RGA**].

5.1 Screening

Screening for STIs depends on the individual's risk factors (see *Section 4.4*) [6]. Routine laboratory screening should be considered for sexually active adolescents and pregnant women [1] [**L1, RGA**].

Routine laboratory screening for common STIs in sexually active adolescents [1,9] [**L1, RGA**]:

- Routine annual screening for *C. trachomatis* and *N. gonorrhoeae* for all sexually active females.
- All individuals being evaluated for STI screening or diagnosis should be tested for HIV infection [1,5] [**L1, RGA**].
- Cervical cancer screening should begin at age of 21 years.
- Routine screening for certain STIs (e.g. syphilis, trichomoniasis, bacterial vaginosis, HSV, human HPV, hepatitis A virus (HAV), and hepatitis B virus (HBV)) is not recommended in asymptomatic adolescents [1,10,11] [**L1, RGB**] but may be considered in patients who are at increased risk for infection [11] [**L1, RGA**].

Laboratory screening for common STIs in pregnant women [1,5,6,9,12] [**L1, RGA**]:

- At the first prenatal visit, pregnant women, especially those at increased risk for infection, should be screened for the following infections, even if they have been previously vaccinated and/or tested:
    - HIV.
    - Syphilis.
    - HBV and hepatitis C virus (HCV).
    - *C. trachomatis*.
    - *N. gonorrhoeae*.
- In the third trimester, retesting for the following infection should be performed in women who are in the high-risk group:
    - HIV.
    - *C. trachomatis.*
- Papanicolaou (Pap) test in pregnant women should be performed at the same frequency as in non-pregnant women.
- Routine screening for bacterial vaginosis, *T. vaginalis*, HSV-2 in asymptomatic pregnant women is not recommended [1,10] [**L1, RGB**].

Asymptomatic patients may be screened for syphilis, hepatitis B, and HIV as part of the blood donation or premarital screening programme [**R-GDG**].

5.2 Counselling

All healthcare providers should encourage risk reduction by providing prevention counselling [1,7] [**L1, RGA**]. It should be offered to [1,13] [**L1**]:

- All sexually active adolescents.
- All adults who:
    - Received an STI diagnosis.
    - Had an STI in the past year.
    - Have multiple sexual partners.
    - Do not consistently use condoms.

The patient-centred risk reduction counselling can be performed during a single brief session and entails [**R-GDG**]:

- Safe-sex information [6].
- Assessing the patient's understanding of STI transmission risk [6].
- Discussing the risk of the patient's sexual behaviour.
- Assessing the patient's willingness to change.
- Negotiating a goal for behavioural change.
- Identifying a concrete and realistic step toward that goal.

5.3 Vaccination

Vaccination is an important strategy to prevent several infections that are sexually transmitted or associated with sexual activity [1] [**L1, RGA**]. The following vaccinations may be considered [1,5,6] [**L1, RGA**]:

- HAV vaccine for:
    - Non-immune MSM.
    - Individuals with chronic liver disease.
    - Individuals with risk factors for HAV infection (including illicit drug use).
- HBV vaccine for:
    - Non-immune individuals with STI risk factors (including MSM, injection drug users, and HIV-infected patients).
- HPV vaccine for:
    - All females and males 9-26 years old.
- Meningococcal vaccine for:
    - Individuals exposed to outbreaks (including MSM).
    - HIV-infected individuals.

5.4 Other Preventive Measures

The following STI prevention efforts should also be considered [1] [**L1, RGA**]:

- Using barrier methods [1,5,14]:
    - Male and female condoms should be considered.
    - Use of male condoms decreases the risk of transmission of HIV, chlamydia, gonorrhoea, HSV, and HPV.
- Antimicrobial-based preventive strategies [1,14,15]:
    - Antiretroviral treatment as prevention.
    - Pre-exposure prophylaxis.
    - Post-exposure prophylaxis to prevent HIV infection.
    - Suppressive antiviral therapy of individuals with genital HSV to prevent transmission.

6 Clinical Assessment

6.1 Clinical Presentation

If present, signs, and symptoms may vary in severity depending on the degree of the disease. Most common symptoms of STIs include but are not limited to [16]:

- Dysuria.
- Genital skin problems.
- Unusual vaginal discharge.
- Unusual or a change in vaginal bleeding (including post-coital and inter-menstrual bleeding).
- Urethral discharge.
- Abdominal pain or deep dyspareunia.
- Testicular discomfort or swelling.
- Peri-anal or anal symptoms.

More clinical features and symptoms that can be used to recognise and diagnose specific STIs are listed in respective sections under the Management (see *Sections 8 and 9*).

6.2 History

Individuals who are at high risk of STIs should be identified using their sexual history [17] [**L1, RGA**].

The utmost care should be taken to preserve [16,17] [**L3, RGA**]:

- Private environment:
  - One-to-one structured discussions are preferred.
  - Each session should last at least 15–20 minutes.
- Confidentiality of the patient.
- Confidentiality of patient's sexual contacts.
- The right to select a clinician of their preferred gender where possible.

History should be detailed and comprehensive[16,17] [**L1, RGA**]. The health worker may need to ask for more complaints in addition to the symptoms of STIs as concomitant medical illnesses or infections may dictate the risk of infection and the choice of treatment [**R-GDG**].

The following should be covered as part of a comprehensive history [6,16,18] [**L3, RGA**]:

- Age, sex, marital status.
- Reasons for attendance.
- Presence or absence of any complaints and symptoms.
- Last sexual contact and previous sexual contacts with a different partner(s), if within the last three months.
- Contraception use and risk of pregnancy.
- Sexual practices.
- HIV/viral hepatitis risk.
- Safeguarding concerns.
- Use of recreational drugs (including alcohol).
- Past medical and surgical history where relevant.
- Vaccination history (more details in *Section 5.3*).
- Drug history and history of allergies.

6.3 Examination

The physical examination of a patient suspected to have STIs is complimentary to the history of the patient[19]. The health worker should be systematic and meticulous during the examination; coexisting STIs or other medical conditions should not be missed (e.g. presence of oral thrush, lymphadenopathy, or herpes zoster scar) [**R-GDG**].

6.3.1 Examination in Men

Examination in men should proceed as follows [**R-GDG**]:

- General examination:
  - Inspection of the skin for the presence of any rash, sores, warts and discoloration.
  - Palpation to determine the presence of enlargement of lymph nodes in the anterior and posterior cervical region, sub mental, sub occipital, axillary and epitrochlear areas.
- Examination of the oral cavity.
  - Inspection with a torch for ulcers, candidiasis, leucoplakia, gingivitis.
- Examination of the penis:
  - Retraction of the foreskin to look for redness, rash, discharge, warts and ulcers on the glans penis.
  - The urethra should be milked for discharge if an obvious urethral discharge is not seen.
- Examination of the scrotum and testes:
  - Palpation of the scrotum and testes with the aim of ruling out any swelling and pain.
- Examination of the inguinal and femoral triangle lymph nodes:
  - Palpation of the inguinal areas and the femoral triangles to check for lymphadenopathy or lymphadenitis.

6.3.2 Examination in Women

Examination in women should proceed as follows [**R-GDG**]:

- General examination:
  - Inspection of the skin for the presence of any rash, sores, warts, and discoloration.
  - Palpation to determine the presence of enlargement of lymph nodes in the anterior and posterior cervical region, sub mental, sub occipital, axillary and epitrochlear areas.
- Examination of the oral cavity.
  - Inspection with a torch for ulcers, candidiasis, leucoplakia, gingivitis.
- Examination of the abdomen:
  - Palpitation to estimate the size of the liver and spleen.
  - Palpitation for the presence of any masses, tenderness, guarding and rebound tenderness.
- Examination of the inguinal and femoral triangle lymph nodes:
  - Palpation of the inguinal areas and the femoral triangles to check for lymphadenopathy or lymphadenitis.
- Examination of the vulva:
  - Separation of the labia and visual inspection of the vulva for the presence of any lesions.
- Examination of the anus and perineum:
  - Visual inspection for the presence of any lesions.
- Speculum examination:
  - Visualise the cervix.
- Digital bimanual examination:
  - Examination to enlist cervical tenderness/excitation or adnexal masses.
- Examination for intimate partner violence [20].

7 Investigations

All laboratories conducting STI tests should follow a quality improvement programme if not accredited nationally or internationally to ensure that all reports produced by the laboratory are of high quality [21] [**L1, RGA**].

Tests for STIs may be used for different purposes, including [21] [**L1**]:

- Surveillance.
- Validation of syndromic management algorithms.
- Quality assurance.
- Diagnosis of persons with signs and symptoms of possible STI
- Screening of asymptomatic at-risk persons.
- Antimicrobial susceptibility testing.

The minimum tests that in combination constitute an STI check (an STI screen) are those for [14] [**L1**]:

- Chlamydia.
- Gonorrhoea.
- Syphilis.
- HIV.

If unsure, consider seeking specialist advice and assistance in the interpretation of results [**R-GDG**].

8 Diagnosis & Management of STIs by Causative Organism

8.1 General Principles of Management

The relationship between the caregiver and the patient is very important [1] [**L1, RGA**]:

- The personal attribute of the healthcare specialist is required to build trust with the patient [18].
- The healthcare specialist should be friendly and refrain from value judgments and an accusatory manner[1,7,18].
- Privacy and confidentiality should be assured for patients diagnosed with an STI [18].

Partner notification is a critical component of STI control and prevention, including the re-infection of the same patient [1,5,17]:

- The healthcare specialist should provide help to the patient to identify previous sexual contacts and to get their current partners tested and treated when necessary. This support should be tailored to the patient's individual needs.
- The patient and their partner(s) should be provided with infection-specific information, including advice about possible re-infection.

Management of children with STIs should be performed in close cooperation between clinicians, laboratorians, and child protection organisations[1]. Official investigations should be initiated when indicated[1].

8.2 Gonorrhoea

8.2.1 Aetiology

Gonorrhoea is a common STI of the genitals, rectum, and throat caused by the Gram-negative diplococcus *N. gonorrhoeae* [1,21,23] and transmitted by the direct inoculation of infected secretions from one mucous membrane to another. It can also be transmitted to the newborn from the mother's genital tract at the time of birth [23,24].

8.2.2 Clinical Presentation

Gonorrhoea may be asymptomatic, particularly in women [1,21,23]. Symptoms are rarely present in the pharyngeal and rectal gonorrhoea [21,23]. Most common clinical features and possible complications of untreated gonorrhoea are listed in the table below.

Symptom	Males	Females
Dysuria	Yes	
Dyspareunia with Cervicitis		Yes
Urethral/Vaginal Discharge	Yes	Yes
Ano-Rectal Symptoms, Including Discharge, Irritation, Painful Defaecation, Disturbed Bowel Function	Yes	Yes
Conjunctivitis: Purulent, Sight-Threatening	Yes	Yes

Possible Complications	Males	Females
Epididymo-orchitis	Yes	
Prostatitis	Rarely	
Pelvic Inflammatory Disease (PID)		Yes
Dyspareunia		Yes
Intermenstrual Bleeding and/or Post-Coital Bleeding		Yes
Cervicitis		Yes
Endometritis		Yes
Salpingitis		Yes
Perihepatitis		Yes
Ectopic Pregnancy or Preterm Rupture of Membranes		Yes
Disseminated Disease	Yes	Yes
Septic Arthritis	Yes	Yes
Meningitis or Endocarditis (rarely)	Yes	Yes
Infertility	Rarely	Yes
Vertical Transmission to Neonate During Vaginal Delivery		Yes

Table 8.2.2: Clinical Features of Gonorrhoea in Males and Females [1,21–23].

8.2.3 Assessment and Diagnosis

The diagnosis of gonorrhoea is established by identification of *N. gonorrhoeae* in genital or extra-genital secretions by microscopy, culture, and/or molecular techniques (see *Table 8.2.3*) [1,21] [**L1, RGA**]. No direct immunofluorescence assays, enzyme immunoassays, or serum antibody detection methods are commercially available to date [21]. Direct microscopic examination is not recommended [21] [**L1, RGB**].

Test for cultures should always be performed before treating gonorrhoea [21,23] [**L1, RGA**] for monitoring the local antimicrobial susceptibility, contribute in anti-microbial resistance surveillance, and for evaluating suspected cases of treatment failure [22].

Specimen types	Microscopy	Culture	Nucleic Acid Amplification Test (NAAT)*
Endocervical Swab	Yes[1]	Yes	Yes
Vaginal Swab	No	Yes[2]	Yes (some assays)
Urine Female: Urine Male:	No No	No No	Yes[3] Yes
Urethral Swab	Yes[1]	Yes	Yes
Rectal Swab	No	Yes	No[4]
Oropharyngeal Swab	No	Yes	No[4]
Conjunctival Swab	Yes	Yes	No[4]

Table 8.2.3: Common Diagnostic Tests for *N. gonorrhoeae* detection [21]**.**

Notes on Table 8.2.3:
* - Test both *N. gonorrhoeae* and *C. trachomatis* on the same specimen.
[1] – Microscopy has high sensitivity and specificity in symptomatic men (with urethritis), low sensitivity in asymptomatic men, and endo-cervical infections, and is not recommended for vaginal, urine, rectal, or pharyngeal specimens.
[2] – Not an ideal specimen, mainly applied for pre-pubertal girls or women who have had a hysterectomy and when endo-cervical samples cannot be obtained.
[3] – Urine is not the ideal sample, due to suboptimal sensitivity, for detection of *N. gonorrhoeae* in women. Applied ONLY if endo-cervical swab/self-collected vaginal swab cannot be taken.
[4] – There are no internationally-licensed NAAT tests for use with extra-genital samples, but there is increasing evidence that NAAT tests are more sensitive than culture at these sites. It is recommended that a positive NAAT test for rectal and pharyngeal specimens be confirmed with a supplementary test (NAAT with another target sequence) to avoid false-positive results.

8.2.4 Management

Consider testing for other STIs (including chlamydia, syphilis, and HIV), if not undertaken at first presentation [1] [**L1, RGA**].

Dual antibiotic treatment using two antimicrobials with different mechanisms of action is preferred (see *Table 8.2.4*) [1,22,23] [**L1, RGA**].

- The choice of therapy should be based on the latest available local resistance data [7,23].
- The dual therapy should be administered together on the same day, preferably simultaneously and under direct observation [1,5] [**L1, RGA**].

Pregnant patients should receive the same principal treatment unless otherwise indicated [22] [**L2**].
Consider seeking specialist advice before treating any complicated presentation [**R-GDG**].

Condition	Antimicrobial Recommendations	
	First-Line	Alternative
Uncomplicated: • Genital infection • Anorectal infection	Ceftriaxone 250mg intramuscular (IM), stat + Azithromycin 1g orally (PO), stat	Cefixime 400mg PO + Azithromycin 1g PO Alternative treatment is not recommended because of high levels of resistance but may be considered in patients with severe allergic reactions
Uncomplicated: • Pharyngeal infection	Ceftriaxone 250mg IM, stat + Azithromycin 2g PO, stat	
Rectal Coinfection: • Asymptomatic: • Symptomatic	Ceftriaxone 250mg IM, stat + Doxycycline 100mg PO twice daily for 7 days Ceftriaxone 250mg IM, stat + Doxycycline 100mg PO twice daily for 21 days	For rectal coinfection with chlamydia, treatment should be given for both gonorrhoea AND chlamydia.
Gonococcal conjunctivitis: • Adults • Neonates	Ceftriaxone 250mg intramuscular (IM), stat + Azithromycin 1g orally (PO), stat Ceftriaxone 50mg/kg (maximum 150mg) IM	Cefixime 400mg PO + Azithromycin 1g PO Kanamycin OR Spectinomycin 25mg/kg (maximum 75mg) IM

Condition	Antimicrobial Recommendations	
	First-Line	Alternative
Treatment Failure*	Ceftriaxone 1g IM + Azithromycin 1g PO OR Ceftriaxone 500mg IM + Azithromycin 2g PO OR Cefixime 800mg PO + Azithromycin 2g PO OR Gentamicin 240mg IM + Azithromycin 2g PO (not recommended in pregnancy). (Gentamicin may be infused intravenously (IV) over 30 minutes if IM route is not feasible) OR Spectinomycin 2g IM (if not oropharyngeal infection) + Azithromycin 2g PO	

Table 8.2.4: Treatment Options for Gonorrhoeal Infection [1,5,22,23]**.**
* - Symptoms do not resolve within 3-5 days after treatment or the test-of-cure (TOC) is positive [1].

If the patient has been fitted with an intrauterine device, this should remain in place whilst treating the STI[22] [**L2, RGA**].

In patients with suspected reinfection [23] [**L1, RGB**]:
- Re-treat with a recommended regimen.
- Reinforce sexual abstinence or condom use.
- Provide partner treatment.

Neonates born to women with untreated gonorrhoea should receive the appropriate treatment (see *Table 8.2.4*) [5] [**L2, RGA**]. They should be referred to a consultation with a paediatric specialist [5] [**L2, RGA**]. Prophylactic co-treatment is not generally recommended [5] [**L2, RGB**].

Advise sexually active patients to:
- Avoid sexual contact for 7 days after treatment is administered and until all sexual partners are adequately treated [1] [**L1, RGA**].
- Avoid sex with partners from the last 2 months until the partners have been tested and treated if necessary [1] [**L1, RGA**].

8.2.5 Contact Tracing

Contact tracing should be performed in all patients with confirmed gonorrhoea [1,5,22,23] [**L1, RGA**].
- All sexual contacts in the last 60 days, regardless of symptoms or signs, must be located and examined [5,22] [**L2, RGA**].
- This time period may be extended until a sexual contact is identified [5] [**L2**].

All sexual contacts should be offered treatment [1,5,23] [**L1, RGA**].

8.2.6 Test of Cure and Retesting

Test of Cure (TOC) is not recommended in individuals with uncomplicated urogenital or rectal gonorrhoea and treated with the recommended regimen [1] [**L1, RGB**]. TOC using NAAT or culture is recommended 2 weeks after the completion of treatment in individuals with pharyngeal gonorrhoea and treated with an alternative regimen [1] [**L1, RGA**].

8.3 Syphilis

8.3.1 Aetiology

Syphilis is a systemic disease caused by *T. pallidum*[25]. It is transmitted by contact with a sore on the genitals, anus, rectum, lips or mouth, or from mother to child during pregnancy [8,26].

The disease can be classified into the following categories based on clinical manifestations (also see *Table 8.3.2*) [1,25,26]:

- Primary syphilis.
- Secondary syphilis.
- Latent syphilis (asymptomatic):
    - Early latent (<1 year):
        - If untreated, people become asymptomatic over a period of 12-24 months after initial infection.
    - Late latent (>1 year):
        - Patients with syphilis of unknown duration and absent symptoms, should be considered as having late latent infection.
        - After 24 months people are considered no longer infectious to sexual partners, but women may still pass the infection on to the unborn fetus.
- Tertiary syphilis.

8.3.2 Clinical Presentation

About 50% of people are asymptomatic [22]. Untreated, symptoms slowly resolve over a period of weeks but may recur [22]. Latent infections are characterised by positive syphilis serology with no clinical symptoms or signs [1,22,26].

Stage	Symptoms

Primary Syphilis	• Genital ulcer or chancre(s):
	  ○ Usually painless.
	  ○ Ulcers may be difficult to notice on anal skin, on the cervix, or in the mouth.
	  ○ Ulcers tend to be non-tender.
	  ○ Ulcers usually have a well-defined margin with an indurated base.
	  ○ Multiple chancres are present in ~30% of cases.
	  ○ Untreated chancres spontaneously heal within 3-10 weeks.
	• Inguinal lymph nodes are usually enlarged, rubbery and non-tender.

Secondary Syphilis	• Constitutional symptoms, including:
	  ○ Fever.
	  ○ Malaise.
	  ○ Headache.
	  ○ Lymphadenopathy.
	• Maculopapular rash in over 90% of cases:
	  ○ Usually generalised.
	  ○ Usually involves the trunk but may affect the palms and soles only.
	  ○ Often symmetrical and non-itchy.
	  ○ Can be confused with drug eruptions, pityriasis rosea, or guttate psoriasis.
	• Mucocutaneous lesions:
	  ○ Affect both skin and mucous membranes.
	• Alopecia.
	• Condylomata lata (wart-like lesions in the anogenital area).
	• Neurological signs including cranial nerve palsies, ophthalmic signs, and meningitis.

Stage	Symptoms
Latent Syphilis	• Hydramnios. • Fetal loss due to spontaneous abortion. • Preterm delivery. • Vertical transmission to neonate during vaginal delivery.

Tertiary Syphilis	• Gummatous lesions (gumma).
	• Cardiovascular disease (cardiosyphilis)
	• Neurosyphilis:
	  ○ Acute changes in mental status.
	  ○ Meningitis.
	  ○ Stroke.
	  ○ Cranial nerve dysfunction.
	• Auditory or ophthalmic and ocular abnormalities.

Table 8.3.2: Clinical Features of Syphilis [1,24–26]**.**

8.3.3 Assessment and Diagnosis

The diagnosis of syphilis is based on the patient's history, physical examination, laboratory testing and sometimes radiology (see below) [26].

The available laboratory tests for diagnosis of syphilis include [21,25–27]:

- Direct detection methods (*these are not generally available*):
  - Darkfield microscopy.
  - Direct fluorescent antibody test.
  - NAAT.
- Serology:
  - Specific treponemal tests:
    - Fluorescent treponemal antibody absorption (FTA-ABS).
    - *T. pallidum* particle agglutination assay (TPPA).
    - *T. pallidum* Hemagglutination Assay (TPHA).
    - *T. pallidum* enzyme immunoassay (TP-EIA).
    - Chemiluminescence immunoassay (CIA).
    - Immunoblots.
    - Microhemagglutination test for antibodies to *T. pallidum* (MHA-TP).
    - Rapid treponemal tests.
  - Non-treponemal tests:
    - Rapid plasma reagin (RPR)*:
      - If a non-treponemal RPR test was used for the screening and latent syphilis needs to be excluded, a treponemal test is required [**R-GDG**].
    - Venereal Disease Research Laboratory (VDRL).
    - Toluidine Red Unheated Serum Test (TRUST).
    - Dual non-treponemal/treponemal rapid test.
- Examination of cerebrospinal fluids.

Latent infections (without clinical manifestations) should be detected by serological testing [1] [**L1, RGA**]:

- A *presumptive diagnosis* of syphilis requires a positive result from either treponemal or non-treponemal test.
- A *confirmed diagnosis* requires positive results from both types of serological tests.

8.3.4 Management

Penicillin administered parenterally is preferred (see *Table 8.3.4*) [1] [**L1, RGA**]:

- Long acting penicillin formulation is recommended, as short acting formulations (e.g. benzyl penicillin) are ineffective [22] [**L2, RGA**].
- Supplementation with other antibiotics (e.g. amoxicillin) is not recommended [1] [**L1, RGB**].
- The preparation, dosage, and length of treatment depend on the stage and clinical manifestations of the disease [1].

Patients with primary and secondary syphilis should have RPR repeated on the day treatment is commenced to provide an accurate baseline for monitoring treatment [22] [**L2**].

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
Infectious Syphilis (Primary, Secondary, Early Latent)			
Adults	Benzathine penicillin 2.4 MU, IM, stat	Doxycycline 100 mg PO twice daily, for 14 days	Non-penicillin regimens have less evidence than penicillin but have shown to be effective
Pregnant Women		Erythromycin 500mg PO, 4 times daily for 14 days OR Ceftriaxone 1g IM, once daily for 10-14 days OR Azithromycin 2 g once PO	Seek specialist advice. Only penicillin has been shown to be effective, so those allergic should be desensitised and treated with penicillin [1,5]. Consider alternatives ONLY if desensitisation is not possible
Infants and Children	Aqueous benzyl penicillin 100 000–150 000 U/kg/day IV for 10–15 days OR Procaine penicillin 50 000 U/kg/day single dose IM, for 10–15 days		The dose should not exceed the adult dose of 2.4 MU
Non-Infectious Syphilis (Late Latent)			
Adults	Benzathine penicillin 2.4 MU, IM, weekly for 3 weeks	Doxycycline 100 mg PO twice daily, for 28 days	Non-penicillin regimens have less evidence than penicillin but have shown to be effective.
Pregnant Women		Erythromycin 500mg PO, 4 times daily for 30 days	Seek specialist advice. Only penicillin has been shown to be effective, so those allergic should be desensitised and treated with penicillin [1,5]. Consider alternatives ONLY if desensitisation is not possible

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
Tertiary Syphilis			
Adults	Crystalline penicillin G, 4 MU, IV q4h for 10-14 days.	Ceftriaxone 2g IV daily for 10-14 days	In penicillin-allergic patients, strongly consider penicillin desensitisation, followed by treatment with penicillin.

Table 8.3.4: Treatment Options for Syphilis [1,5,24,26]**.**

In the following cases, consider referral to a specialist:

- Early referral of all patients (including pregnant patients[5]) with syphilis to sexual Health Clinic is strongly recommended [**R-GDG**].
- Patients with complicated syphilis and acute neurological, ophthalmic, or suspected tertiary disease should be referred to local sexual health or infectious diseases clinic [**R-GDG**].
- Patients with syphilis and HIV co-infection should be referred to infectious disease specialist [**R-GDG**].
- Infants and children aged ≥1 month with primary and secondary syphilis should be referred to a paediatric infectious-disease specialist and evaluated for sexual abuse [1].

8.3.5 Contact Tracing

Contact tracing for syphilis should be performed in all patients with confirmed infection [1,5,23] **L1, RGA**]. The period should be selected according to sexual history and clinical stage of infection [22]:

- Primary syphilis: 3 months plus duration of symptoms.
- Secondary syphilis: 6 months plus duration of symptoms.
- Late latent syphilis: long term partners only.

Presumptive treatment (benzathine penicillin 2.4 MU, IM, stat) should be offered to [1,22] [**L1, RGA**]:

- Individuals who have had sexual contact with a patient who receives a diagnosis of primary, secondary, or early latent syphilis within 90 days preceding the diagnosis.
- Individuals who have had sexual contact with a patient who receives a diagnosis of primary, secondary, or early latent syphilis ≥ 90 days before the diagnosis if:
    - Serological test results are not immediately available.
    - Serological test results confirm syphilis.
    - The opportunity for follow-up is uncertain.

8.3.6 Test of Cure and Retesting

Clinical evaluation of the patient and serial RPR testing is recommended at 3 months, at 6 months, 12 months, and 24 months after completing treatment [**R-GDG**]. Consider retesting for HIV and other STIs at the 3 months visit [22] [**L2**].

Note that even after treatment, syphilis treponemal tests may remain positive for life. Patients with positive serology tests do not necessarily require treatment [5].

8.4 Chlamydia

8.4.1 Aetiology and Classification

Infection by *C. trachomatis*, is one of the most common bacterial STIs worldwide[28], especially among individuals <25 years old who are at greatest risk [29]. *C. trachomatis* is presented by three biovars based on the type of infection [21] (see *Table 8.4.1*). The predominant biovar consists of serovars D-K. Chlamydial infection can also be transmitted to the newborn from the mother at delivery, resulting in neonatal conjunctivitis and/or nasopharyngeal infection [28].

Serovar	Characteristics	Infection
A-C (Incl. Ba)	Non-invasive	Endemic blinding trachoma
D-K (Incl. Da, Ia, Ja)	Non-invasive	Urogenital, conjunctivitis, neonatal pneumonia
L1, L2, L3 (Incl. L2a, L2b)	Invasive	Lymphogranuloma venereum (LGV)

Table 8.4.1: Characteristics and Infections Associated with Different Serovars of *C. trachomatis* [21].

8.4.2 Clinical Presentation

Genital and non-genial (i.e. rectal and oropharyngeal) chlamydial infections are frequently asymptomatic[1,28,29]. Approximately 50% of males and 70% of females have no symptoms [22,28]. The most typical clinical features are listed in table below.

Symptom of Genital Infections	Males	Females
Urethral/vaginal discharge	Yes	Yes
Dysuria	Yes	Yes
Testicular pain	Yes	
Pelvic pain		Yes
Deep dyspareunia		Yes
Post-coital and intermenstrual bleeding		Yes
Cervical friability and discharge		Yes
Symptoms of Oropharyngeal Infections	**Males**	**Females**
Rectal discharge	Yes	Yes
Rectal pain	Yes	Yes
Blood in the stools	Yes	Yes
Symptoms of Oropharyngeal Infections	**Males**	**Females**
Pharyngitis.	Yes	Yes
Mild sore throat	Yes	Yes
Possible Complications	**Males**	**Females**
Epididymo-orchitis	Yes	
Prostatitis	Yes	
Reactive arthritis	Yes	Yes
Salpingitis		Yes
Ectopic pregnancy		Yes
Preterm birth and low birth weight		Yes
Tubal factor infertility		Yes
Vertical transmission to neonate during vaginal delivery		Yes

Table 8.4.2: Clinical Features of Chlamydial Infection [1,21,22,28,29].

8.4.3 Assessment and Diagnosis

A number of chlamydia diagnostic technologies are currently available (see *Table 8.4.3*) [1,21,28].

The choice of test is dependent on the resources available and level of laboratory support [**R-GDG**] but when selecting the following should be considered:

- Asymptomatic patients can collect vaginal swabs, urine, and anorectal swabs themselves [1,21,22] [**L2**].
- NAATs are strongly recommended for diagnosis and screening of chlamydial infections due to their superior performance characteristics [1,21,24,29] [**L1, RGA**].
- Culture tests should be reserved for use in reference laboratories where isolates stored for potential future phenotypic, genetic studies and/or monitoring of possible antimicrobial resistance [21] [**L1**].
- Direct immunofluorescence assay (DFA) test is highly recommended for immediate identification of conjunctival infections [21] [**L1, RGA**].

Specimen Types	NAAT*	Culture	DFA	Point-of-Care Test
Endocervical Swab	Yes	Yes	Yes	Yes
Liquid Cytology Medium	Yes (some tests)	No	No	No
Vaginal Swabs: Self-Collected: Clinician-Collected:	 Yes (some tests) Yes (some tests)	 No No	 No No	 Yes (some tests) Yes (some tests)
Urine Female: Urine Male:	Yes Yes	No No	No No	No No
Male urethral swab	Yes	Yes	Yes	Yes
Rectal swab	No[1]	Yes[2]	Yes[2]	No
Oropharyngeal swab	No[1]	Yes[2]	Yes[2]	No
Conjunctival swab	No[1]	Yes	Yes	No

Table 8.4.3: Diagnostic Tests for *C. trachomatis* [21].

* - Test both *N. gonorrhoeae* and *C. trachomatis* on same species.

[1] – Data indicate that appropriate NAATs perform well for these sample types, but no manufacturer has a claim for extra-genital specimens.

[2] – Compared to modern NAATs, the sensitivity of culture and DFA assay is likely to be even lower for these specimen types.

8.4.4 Management

Consider testing for other STIs (including gonorrhoea and HIV), if not undertaken at first presentation [1,22,29] [**L1, RGA**]. Chlamydia treatment should be provided promptly for patients with high index of suspicion [**R-GDG**] and all patients who test positive[1,28] (see *Table 8.4.4*).

Note:

- Treatment may be initiated without waiting for lab results [**R-GDG**].
- Prophylactic treatment of newborns from women with untreated chlamydial infection is **not** recommended[1,5] [**L2, RGB**]. All cases should be monitored for signs and symptoms [1,5] [**L2, RGA**].
- If the patient has been fitted with an intrauterine device, this should remain in place while treating the STI[22] [**L2, RGA**].
- If the infection remains untreated, chlamydial infection may persist or resolve spontaneously with no sequelae but may result in severe complications [28,29].

Advise sexually active patients to:

- Avoid all sexual contact for 7 days after treatment is administered or until completion of the selected regimen and resolution of symptoms [1,29] [**L1, RGA**].
- Avoid sex with partners from the last 6 months until the partners have been tested and treated if necessary [22] [**L2, RGA**].

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
Uncomplicated: • Genital infection • Pharyngeal infection	Doxycycline 100mg PO, twice daily for 7 days OR Azithromycin 1g PO, stat	Erythromycin base 500mg PO, 4 times daily for 7 days OR Erythromycin ethylsuccinate 800mg PO, 4 times daily for 7 days OR Levofloxacin 500mg PO, once daily for 7 days OR Ofloxacin 300mg PO, twice daily for 7 days	
Anorectal Infection: • Asymptomatic: • Symptomatic:	Doxycycline 100mg PO, twice daily for 7 days Doxycycline 100mg PO, twice daily for 21 days	Azithromycin 1g PO, stat, and repeat in 1 week	
Rectal Coinfection • Asymptomatic: • Symptomatic:	Ceftriaxone 250mg IM, stat + Doxycycline 100mg PO, twice daily for 7 days Ceftriaxone 250mg IM, stat + Doxycycline 100mg PO, twice daily for 21 days		For rectal coinfection with gonorrhoea, treatment should be given for both infections [5,29]
Lymphogranuloma Venereum	Doxycycline 100mg PO, twice daily for 21 days	Azithromycin 1 g PO weekly for 3 weeks	
Pregnant or Breastfeeding Women	Azithromycin 1g PO, stat	Amoxicillin 500mg PO, 3 times daily for 7 days OR Erythromycin base 500mg PO 4 times daily for 7 days OR Erythromycin base 250mg PO 4 times daily for 14 days OR Erythromycin ethylsuccinate 800mg PO 4 times daily for 7 days OR Erythromycin ethylsuccinate 400mg PO 4 times daily for 14 days	Doxycycline and erythromycin estolate are contraindicated in pregnant women [1,5]
Conjunctivitis: • Infants and children	Azithromycin 20mg/kg/day PO, once daily for 3 days	Erythromycin 50mg/kg/day PO in 4 divided doses daily for 14 days	Topical antibiotic therapy is not required when systemic treatment is administered [1].

Table 8.4.4: Treatment Options for Chlamydial Infections [1,5,24,28,29]**.**

8.4.5 Contact Tracing

Contact tracing is important to prevent reinfection and reduce transmission:

- Sexual partners should be referred for evaluation, testing, and presumptive treatment if they had sexual contact with the partner during the 60 days preceding the patient's onset of symptoms or a chlamydia diagnosis[18].
- Consider extending this time period until all sexual contacts are identified [5].

8.4.6 Test of Cure and Retesting

A Test of Cure (TOC) is not routinely recommended [22] [**L2**] but patients in the groups listed below should pass the NAAT test at least 3-4 weeks after treatment is completed [1,5,22] [**L1, RGA**]. An earlier TOC could yield a false positive result due to the presence of chlamydia DNA remnants [1,22] [**L1, RGC**].

Test of Cure is warranted in the following patients[1,5,22] [**L1, RGA**]:

- Pregnant women.
- Patients with rectal chlamydia.
- Pre-pubertal patients.
- Patient whose therapeutic adherence is in question.
- Patients with persistent symptoms.
- If reinfection is suspected.

8.5 Chancroid

8.5.1 Aetiology

Chancroid is a rare form of genital ulceration caused by the pathogen *Haemophilus ducreyi* and is mainly seen in individuals from the North India, African and the Caribbean regions [1,30]. It is transmitted exclusively by sexual contact [21].

It is more frequently seen in men than in women [21,22] and in uncircumcised rather than in circumcised men[22,30]. It is often associated with commercial sex workers and drug use [22].

8.5.2 Clinical Presentation

Almost all cases are symptomatic (see *Table 8.5.2*) [22]. Chancroid presents with/without bubo formation (localised swollen painful lymph nodes) [21,22]. Chancroid may also have atypical presentations and can be easily confused with other genital ulcer diseases (e.g. genital herpes) [21].

Symptom	Males	Females
Multiple, deep, painful genital ulcers with ragged undermined edges	Typically occurs on the prepuce and in the coronal sulcus.	Typically occur on the vulva; Less commonly on the cervix.
Perianal ulcers	Yes	Yes
Extragenital lesions (e.g. fingers)	Yes	Yes
Possible Complications	**Males**	**Females**
Bubo formation	Yes	Yes
Phagedenic ulceration	Yes	

Table 8.5.2: Clinical Features of Chancroid [1,21,30]**.**

8.5.3 Assessment and Diagnosis

At present, there is no commercially available for chancroid diagnostic test (culture, molecular, antigen detection and serology have limited use in reference or research centres) [21,27]. Therefore, if chancroid is suspected, seek specialist advice.

When diagnosing chancroid, consider the two types of diagnosis [1] [**L1, RGA**]:

- A *probable diagnosis* of chancroid can made if all four of the following criteria are met:
  - The patient has one or more painful genital ulcers.
  - The patient has no evidence of *T. pallidum* infection by darkfield examination of ulcer exudate or by serological testing (performed at least seven days after the onset of ulcers).
  - The clinical presentation, appearance of genital ulcers, and if present, regional lymphadenopathy are typical for chancroid.
  - A test for HSV – polymerase chain reaction (PCR) or culture – performed on the ulcer exudate is negative.
- A *definitive diagnosis* of chancroid requires a laboratory confirmation on special culture media [1].

8.5.4 Management

Patients with genital ulcers should also be tested for syphilis, HIV, herpes infections, LGV and donovanosis if indicated [1,22,30] [**L1**]. HIV test should also be performed at the time chancroid is diagnosed [1,22] [**L1**].

Condition	Antimicrobial Recommendations	
	First-Line	Alternative
Uncomplicated infection	Azithromycin 1g PO, stat OR Ceftriaxone* 250mg IM, stat OR Ciprofloxacin** 500mg PO, twice daily for 3 days OR Erythromycin base 500mg PO, 3 times a day for 7 days	Alternative regimens are not recommended.

Table 8.5.4: Treatment Options for Chancroid [1,30]**.**
* – Children can be treated with ceftriaxone.
** – Ciprofloxacin is contraindicated in pregnant and lactating women as well as in children and adolescents less than 18 years.

Note:

- Usually single dose regimens are sufficient [22].
- HIV positive patients may require longer courses [1,22] [**L1, RGA**] and multiple day regimens [30,31] [**L2, RGA**].
- Needle aspiration of fluctuant buboes or incision and drainage may be required in some cases [1,30] [**L1**]. If performed, antibiotics should still be provided [30] [**L1**].
- All sexual contacts should be offered treatment [1,22,30] [**L1, RGA**] and testing for other STIs, including HIV [30] [**L1**].
- Advise sexually active patients to avoid sexual contact for 7 days after treatment is administered[22] and until all current sexual partners are adequately treated [30].

8.5.5 Contact Tracing

Contact tracing is important to prevent reinfection and reduce transmission. Male and female partners should be traced back for 10 days preceding the patient's onset of symptoms[18].

8.5.6 Test of Cure and Retesting

Test of Cure (TOC) is not routinely recommended [22,30] [**L1, RGB**].

Patients should be re-examined 3-7 days after initiation of therapy to:

- Assess for symptom resolution [1,30]. Note that complete healing of ulcers may take >2 weeks [1].
- Evaluate healing that might be slower in some groups of patients (e.g. HIV-infected patients and uncircumcised men) [30].
- If the initial tests for syphilis and HIV infection were negative, a serological test should be performed 3 months after the diagnosis of chancroid [1,30] [**L1, RGA**].

8.6 Donovanosis

8.6.1 Aetiology

Donovanosis (Granuloma inguinale) is a rare cause of genital ulceration due to the gram-negative bacterium *Klebsiella granulomatis*[1]. It should be considered in patients returning from areas where the disease may be endemic, e.g. southern Africa, India, central Australia, and parts of South America [1,22].

Donovanosis is transmitted sexually but may also be transmitted vertically and by casual contact [22,32].

8.6.2 Clinical Presentation

The disease is characterised by slowly progressive ulcerative lesions (see *Table 8.6.2*) [1,32], which may resemble lesions formed by other STIs (e.g. syphilis, chancroid, carcinoma, and amoebiasis) [21].

Symptom	Males	Females
Relatively painless anogenital ulceration	Yes	Yes
Lesions: • Ulcerogranulomatous: beefy red ulcers that bleed to the touch. • Hypertrophic: with a raised irregular edge. • Necrotic. • Sclerotic or cicatricial with fibrous/scar tissue.	On the prepuce, coronal sulcus, frenum and glans penis	In the vulvo-labial area, vagina, cervix, perineum, and perianal area
Offensive odour due to secondary anaerobic bacterial infection	Yes	
Possible Complications	**Males**	**Females**
Extra-genital disease, involving non-genital mucous membranes	Rarely	Rarely
Secondary spread to liver and bone	Rarely	Rarely
Increase in HIV transmission risk	Yes	
Neoplastic transformation of untreated ulcers	Yes	
Spread of infection to uterus, fallopian tubes, ovaries and other pelvic structures.		Yes
Local tissue lymphatic destruction and subsequent pseudo-elephantiasis of genitalia		Yes
Vertical transmission to neonate during vaginal delivery		Yes

Table 8.6.2: Clinical Features of Donovanosis[1,21,22,32].

8.6.3 Assessment and Diagnosis

The causative organism is difficult to culture [1,21], therefore diagnosis typically requires visualisation of dark staining *Donovan Bodies* on a tissue crush preparation or biopsy[1]. Serological assays are currently unavailable [21]. Several other assays should be considered (see *Table 8.6.3*).

Test	Site/Specimen	Consideration
Histology	Stained histological sections of tissue/ lesion biopsies. Stained impression smears obtained from clinical lesions.	Low to moderate sensitivity but highly specific; requires experienced histopathologist.
NAAT	Dry swab or punch biopsy of lesions.	Highly sensitive and specific but available in research laboratories only.

Table 8.6.3: Diagnostic Tests for Donovanosis Detection [21,22,27,32].

8.6.4 Management

Patients with current donovanosis and patients with a past history of donovanosis, who present with unusual symptoms, should be reviewed for the extra-genital disease [22] [**L2**]. All individuals who receive a diagnosis of donovanosis should be tested for HIV [1] [**L1, RGA**].

Antibiotics should not be delayed [32] [**L1, RGA**]. Presumptive treatment should be initiated while waiting for diagnostic confirmation [22] [**L2, RGA**]. A number of effective antimicrobial regimens are currently available (see *Table 8.6.4*).

Condition	Antimicrobial Recommendations	
	First-Line	**Alternative**
Anogenital lesions	Azithromycin 500mg PO, daily for 7 days OR Azithromycin 1g PO, once weekly for at least 4 weeks and until complete resolution of lesions	Doxycycline 100mg PO, twice daily for a minimum of 3 weeks and until complete resolution of lesions OR Ciprofloxacin 750mg PO, twice daily for at least 3 weeks and until all lesions have completely healed. OR Erythromycin base 500mg PO, 4 times daily for at least 3 weeks and until all lesions have completely healed. OR Trimethoprim-sulfamethoxazole one double-strength (160mg/800mg) tablet PO, twice daily for at least 3 weeks and until all lesions have completely healed OR Co-trimoxazole 160/800 mg PO, twice daily
Pregnant and Lactating Women	Azithromycin is recommended. Erythromycin may be used.	Doxycycline is contraindicated. Sulfonamides should also be avoided.
Children	Azithromycin 20mg/kg PO, once daily until complete resolution of lesions.	Prophylactic antibiotics should be considered in neonates born to mothers with genital lesions: Azithromycin 20mg/kg once daily for 3 days.

Table 8.6.4: Treatment Options for Donovanosis[1,22,32,33].

Note:

- If there is no improvement within the first few days of therapy:
    - Another antibiotic (e.g. gentamicin 1mg/kg IV every 8 hours) may be used as an adjunct to these regimens [1,32] [**L1, RGA**].
    - Complicated or disseminated infection may require prolonged treatment [1] [**L1**]. Patients may require hospital admission [22] [**L2**].

Advise sexually active patients to:

- Avoid sexual contact for 7 days after treatment is administered [22].
- Avoid sex with partners from the last 6 months until the partners have been reviewed and treated if necessary [22].

8.6.5 Contact Tracing

Individuals who have had sexual contact with a patient diagnosed with donovanosis within the 60 days before onset of the patient's symptoms should be examined and offered therapy if required [1,32] [**L1, RGA**].

8.6.6 Test of Cure and Retesting

Patients should be followed clinically until signs and symptoms resolve and lesions have healed completely [1,32] [**L1, RGA**]. Because of high risk of relapse or re-infection, patients should be reviewed at completion of treatment course and at 3 months [22] [**L2**].

Consider biopsy in patient with lesions recurrence to exclude skin cancer [22] [**L2**].

8.7 Lymphogranuloma Venereum

8.7.1 Aetiology

Lymphogranuloma Venereum (LGV) is caused by the bacterium *C. trachomatis* serovars L1-L3, which disseminate via underlying connective tissue and spread to regional lymph nodes[1,21,22,27,34]. It is distributed worldwide but is more prevalent in tropical and subtropical areas such as East and West Africa, India and South-East Asia, South America, and the Caribbean [21,22].

8.7.2 Clinical Presentation

LGV is usually symptomatic [22]. The most common clinical manifestation of LGV is unilateral inguinal and/or femoral lymphadenopathy with or without an associated primary lesion (see *Table 8.7.2*) [1,21]. Rectal LGV can be asymptomatic [1].

The site of the primary lesion depends on the site of inoculation [22,34]. LGV can cause[34]:

- Inguinal disease after inoculation of the genitalia or anal area.
- Anorectal syndrome after inoculation via the rectum.

Primary Symptoms	Males	Females
Small ulcers or nodules on penis/vulva or anus	Yes	Yes
Proctitis	Yes	Yes
Unilateral inguinal and/or femoral lymphadenopathy	Yes	Yes
Erythema	Sometimes	Sometimes
Tertiary Symptoms ('Anogenitorectal Syndrome')	**Males**	**Females**
Presence	Less often	More often
Chronic proctitis	Yes	Yes
Fistulae	Yes	Yes
Strictures	Yes	Yes
Genital oedema	Yes	Yes
Scarring of vulva (Esthiomene)		Yes

Table 8.7.2: Clinical Features of LGV [1,21,34]**.**

Note:

- Patients with genital and colorectal LGV lesions can develop secondary bacterial infection or can be coinfected with other pathogens transmitted either sexually or non-sexually [1,22].

8.7.3 Assessment and Diagnosis

Diagnosis of LGV is based on clinical suspicion, epidemiological information, and the exclusion of other aetiologies for proctocolitis, inguinal lymphadenopathy, or genital or rectal ulcers [1] [**L1**]. HSV NAAT should be taken at the time of consultation to exclude HSV causing symptoms of proctitis [22] [**L2**].

A Serological test for LGV is not currently available [1]. However, several other assays may be used to diagnose LGV (see *Table 8.7.3)*. A gram stain showing >20 white cells/high powered film is suggestive of LGV [22].

Genital lesions, rectal specimens, and lymph node specimens (i.e. lesion swab or bubo aspirate) can be tested for *C. trachomatis* by [1,34]:

- Culture.
- Direct immunofluorescence.
- Nucleic acid detection (NAAT performed on rectal specimens is the preferred approach[1] [**L1**]).

Routine screening of asymptomatic patient is not recommended [22] [**L2**].

Test	Site/Specimen	Consideration
Chlamydia NAAT*	• Clinician collected or self-collected rectal swab	Initial test in patients with proctitis symptoms
LGV specific NAAT	Performed on same rectal sample collected for initial test	Subsequent test performed on positive rectal chlamydia test
Chlamydia NAAT*	• Swab from ulcers. • First pass urine in men. • Endocervical in women. • Bubo aspirate or swab when present.	Chlamydia NAAT is not a routine test for genital ulceration and should only be performed in those with high clinical suspicion of LGV [34].

Table 8.7.3: Diagnostic Tests for LGV Detection [21,27,34]**.**
* – The test doesn't discriminate between non-LGV and LGV strains[21]. PCR-based genotyping can be used for this purpose [1,21].

8.7.4 Management

All individuals who receive a diagnosis of LGV should be tested for gonorrhoea, syphilis, HCV, and HIV co-infection [34] [**L1, RGA**]. Consider syphilis NAAT from an ulcerated area in addition to serology [22] [**L2**].

At the initial consultation, patients with proctitis and a suspicion of LGV should be treated for LGV (see *Table 8.7.4*), gonorrhoea (see *Section 8.2*), and chlamydia (see *Section 8.4*). Consider addition of valaciclovir 500mg PO, twice daily for 7 days [22] [**L2**].

Condition	Antimicrobial Recommendations	
	First-Line	Alternative
Suspected or Confirmed LGV	Doxycycline 100mg PO twice daily for 21 days	Azithromycin 1gm PO, once weekly for 21 days OR Erythromycin base 500mg PO, 4 times daily for 21 days
Pregnant Women	Azithromycin 1gm PO, once weekly for 21 days.	Erythromycin may also be used. Doxycycline is contraindicated.

Table 8.7.4: Treatment Options for LGV[1,22,34]**.**

Note:

- Patients with HIV infection may require prolonged therapy [1] [**L1**].
- Needle aspiration of fluctuant buboes or incision and drainage under ultrasound guidance may be required in some cases [1,22,34] [**L1, RGB**].
- If performed, antibiotics should still be provided.
- Seek specialist advice.

Advise sexually active patients to:

- Avoid sexual contact during treatment [22,34].
- Avoid sex with partners from the last 3 months until the partners have been tested and treated if necessary [22].

8.7.5 Contact Tracing

If the patient is symptomatic, sexual partners should be traced back for a minimum of60 day before the onset of the patient's symptoms[18]. If the patient is asymptomatic, sexual partners dating back at least 6 months, should be traced [22].

All traced sexual contacts should be offered empirical treatment until LGV has been excluded [1,34] [**L1, RGA**].

8.7.6 Test of Cure and Retesting

All patients should be followed-up until full resolution of signs and symptoms [1] [**L1**].

TOC using NAAT should be performed at 6 weeks (3 weeks after treatment completion) [22,34] if alternative treatment regimens were used [34] [**L3, RGB**].

Re-screening for gonorrhoea, syphilis, HCV, and HIV infection should be performed 3 months after an LGV diagnosis to cover window periods and exclude reinfections [22,34] [**L1**].

8.8 Mycoplasma Genitalium

8.8.1 Aetiology

Mycoplasma genitalium (M. genitalium) is an established cause of urethritis in men and several inflammatory reproductive tract syndromes and pregnancy complications in women [1,22]. The infection is primarily transmitted by direct genital-genital mucosal contact [35,36].

8.8.2 Clinical Presentation

40-80% of women are asymptomatic [21]. In men, symptoms may resemble those of chlamydia infection [22]. The most common signs and symptoms are listed in *Table 8.8.2*. Anorectal infection in MSM is often asymptomatic [22].

Symptoms	Males	Females
Proctitis	Possibly	
Urethritis	Yes	
Urethral or Vaginal Discharge	Yes	Yes
Dysuria	Yes	Possibly
Urgency		Yes
Cervicitis		Yes
Pelvic or Lower Abdominal Pain		Yes
Intermenstrual and or Post-Coital Bleeding		Yes
Possible Complications	**Males**	**Females**
Epididymo-orchitis	Possibly	
Reactive arthritis	Yes	Yes
PID (endometritis, salpingitis)		Yes
Ectopic Pregnancy and Pre-Term Delivery		Yes
Tubal Factor Infertility		Possibly

Table 8.8.2: Clinical Features of *M. genitalium* Infection [1,21,22,35,36].

8.8.3 Assessment and Diagnosis

Asymptomatic screening is not currently recommended [22] [**L2, RGB**]. Tests should only be offered to symptomatic patients and their sexual contacts [22] [**L2, RGA**].

Because the causative organism is extremely slow to culture, serological and antigen detection assays as well as point-of-care tests have not been approved for clinical use, the only practical method for diagnosis of *M. genitalium* infection is NAAT (see *Table 8.8.3*) [1,21,35,36] [**L1, RGA**].

If NAAT results are not available, *M. genitalium* should be suspected in cases of persistent or recurrent urethritis and may be considered in persistent or recurrent cases of cervicitis and PID [1] [**L1**].

Test	Site/Specimen*	
	Men	Women
NAAT	• First pass urine	• Endocervical swab. • Vaginal swab (clinician or self-collected) • First pass urine**.

Table 8.8.3: Diagnostic Tests for *M. genitalium* Detection [22]**.**
* - Throat swabs are not routinely recommended as pharyngeal infection is uncommon[22].
** - Less sensitive than the vaginal swab.

8.8.4 Management

Individuals who receive a diagnosis of *M. genitalium* infection should be tested for other STIs, including chlamydia, gonorrhoea, syphilis, HIV, and *T. vaginalis* where appropriate [35] [**L2**].

Only few antimicrobial classes have activity against *Mycoplasma* (see *Table 8.8.4*) [35]. These include tetracyclines, macrolides and fluoroquinolones [35]. Doxycycline monotherapy has a poor efficacy [35–37]. Antibiotics targeting cell-wall biosynthesis (e.g. beta-lactams including penicillins and cephalosporins) are ineffective [1].

Antimicrobial susceptibility testing of *M. genitalium* is only feasible in specialised reference laboratories [21].

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
Macrolide Sensitive Infection	Azithromycin* 1gm PO, single dose OR Azithromycin* 500mg for one day, then 250mg PO daily for 4 days	Moxifloxacin 400mg PO, daily for 10-14 days	Alternative regimen for previous treatment failures. In pregnancy, a 5-day-course of azithromycin is generally acceptable.
Macrolide Resistant Infection	Moxifloxacin 400mg PO, daily for 7 days	Pristinamycin may be considered after consultation with a microbiologist.	Treatment in pregnant women may be considered postponed until after delivery.
PID due to *M.genitalium.*	Moxifloxacin 400mg PO, daily for 14 days**		

Table 8.8.4: Treatment Options for *M. genitalium* Infection [1,22,35,36,38]**.**
* – Azithromycin resistance is common [1].
** - After a good response to treatment, the course may be shorten to 10 days [22].

If the first- and second-line principal treatment options are ineffective, consider the following regimen [35,36] [**L2, RGB**]:

- Doxycycline 100mg twice daily for 14 days.
- Pristinamycin 1g PO 4 times daily for 10 days.
- Minocycline 100mg PO twice daily for 14 days.

Advise sexually active patients to:

- Avoid condomless sex until complement of treatment and negative TOC [22,35,36].
- Avoid sex with untested previous sexual partners [22].

8.8.5 Contact Tracing

Contact tracing is highly encouraged [22] [**L2**]. The time period for contact tracing cannot be currently specified [22], therefore all sexual contacts should be offered testing and treatment [1,22,35] [**L2, RGA**].

8.8.6 Test of Cure and Retesting

Test of Cure using NAAT should be performed in all patients no earlier than 3 weeks after starting treatment [35,36,39] [**L2**].

8.9 Trichomoniasis

8.9.1 Aetiology

Trichomoniasis is caused by the protozoan *T. vaginalis* [21,40]. In adults, trichomoniasis is transmitted almost exclusively through sexual intercourse [40].

8.9.2 Clinical Presentation

Most infected individuals have minimal symptoms [1]. Up to 50% of patients are asymptomatic [40] and might be unaware of their infection [1]. If untreated, trichomoniasis might last for very long periods (months to years) [1].

Symptoms	Males	Females
Urethral irritation	Yes	
Urinary frequency	Yes	
Dysuria	Uncommon	Yes
Urethral or Vaginal Discharge	Copious and purulent (rare)	Profuse and frothy, may be yellow-green
Vulval Itch and Soreness		Yes
Ulceration		Yes
Cervicitis		Yes
Low Abdominal Discomfort		Yes
Possible Complications	**Males**	**Females**
Associated with Prostatitis	Yes	
Facilitated HIV Transmission and Acquisition	Yes	Yes
Pregnancy Complications, including Premature Rupture of Membranes, Pre-Term Delivery, Low Birth Weight		Yes
Post-Partum Sepsis		Yes

Table 8.9.2: Clinical Features of Trichomoniasis [1,21,22,24,40].

8.9.3 Assessment and Diagnosis

A number of trichomoniasis diagnostic technologies are currently available (see *Table 8.9.3*). The use of highly sensitive and specific tests is recommended [1] [**L1, RGA**].

Specimen types	Microscopy*	Point-of-Care Test	Culture	NAAT
Endocervical Swab	No	No	No	Yes
Liquid Cytology Medium**	No	No	No	Yes
Vaginal Swabs: Self-collected Clinician-collected	 Yes Yes	 Yes Yes	 Yes Yes	 Yes Yes
Urine: Female **Urine: Male**	No Yes	No No	No Yes	Yes Yes
Male urethral swab	Yes	No	Yes	Yes

Table 8.9.3: Diagnostic Tests for Trichomoniasis [21,40].

* - The most common method for *T. vaginalis* diagnosis might be wet preparations because of convenience and relatively low cost [1,40]. But sensitivity is low compared to NAAT.

** - Neither conventional nor liquid-based Pap tests are considered diagnostic tests for trichomoniasis due to possible false negatives and false positives results [1].

8.9.4 Management

The nitroimidazoles are the only class of antimicrobials that is effective against *T. vaginalis*[1].

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
Uncomplicated Infection	Metronidazole 2g PO with food, stat OR Tinidazole* 2g PO, stat	Metronidazole 500mg PO with food, twice daily for 7 days OR Nystazole Vaginal tab [Metronidazole 500mg + Nystatin 20mg (100,000 IU)]	High-level metronidazole resistance has been reported. Consider treatment with extended doses of oral or intra vagina tinidazole for these patients
Failed Treatment	Metronidazole 500mg PO, twice daily for 7 days OR Metronidazole 800mg PO, 3 times daily for 7 days OR Metronidazole or Tinidazole 2g PO, for 5-7 days OR	Tinidazole 2-3g PO, for 14 days in combination with intravaginal tinidazole 500mg twice daily	Extended metronidazole therapy. Consultation with a specialist is mandatory in alternative treatment.
Pregnant Women	Metronidazole 500mg PO with food, twice daily for7 days		Treatment is recommended only if symptomatic. Tinidazole should be avoided. Newborns should be observed for diarrhoea.
Lactating Women	Metronidazole 400 mg PO, 3 times daily for 7 days		Consider intravaginal treatment. Avoid high doses of metronidazole in breastfeeding because it is secreted in breast milk.
HIV Positive Women	Metronidazole 500mg PO, twice daily for 7 days.		Extended metronidazole regimen may be required

Table 8.9.4: Treatment Options for Trichomoniasis [1,5,22,40].

Note:

- Treatment failures with single-dose metronidazole should trial single dose tinidazole or extended metronidazole therapy.
- Alcohol should be avoided during metronidazole and tinidazole treatment [1,22,40] and for at least 48h (72h for tinidazole) thereafter [40] [**L1, RGC**].
- Intravaginal treatment and metronidazole gel are not generally recommended due to low cure rates [1,40] [**L1, RGB**] but may be considered in some cases, e.g. as an adjuvant in nitroimidazole-resistant infections [1].
- Advise sexually active patients to avoid sex until they and their sexual partners have been adequately treated and any symptoms have resolved [1,22] [**L1, RGA**].
- The infection can be cleared without treatment. The spontaneous cure rate is 20–25% [40].

8.9.5 Contact Tracing

Current partners should be referred for presumptive therapy [1]. All other partners should be traced back for 4 weeks prior to presentation [40]. They should be screened for the full range of STIs[40] and treated simultaneously [5] [**L2**].

8.9.6 Test of Cure and Retesting

Test of Cure is not usually recommended [22] [**L2, RGB**] but may be required if patient remains symptomatic following treatment or if symptoms recur [40] [**L2, RGB**].

Re-testing is recommended for the following groups of patients:

- Who remain symptomatic: after 4 weeks [22].
- Whose partner treatment remains uncertain: after 4 weeks [22].
- All sexually active women: after 3 months [1].
- Pregnant women with HIV: after 3 months [5].

8.10 Genital Warts

8.10.1 Aetiology

90-95% of anogenital warts are caused by non-oncogenic HPV types 6 and 11 [1,21,41,42]. HPV types 16 and 18, which are oncogenic [1,21,41] and cause most cervical, penile, vulvar, vaginal, anal, and oropharyngeal cancers and precancers [1]. They may co-exist in anogenital warts [41,43] but there is no evidence that they cause them[41].

HPV is transmitted via direct skin to skin contact [22,43]. Virus access basal cells of the epithelium via micro-abrasions on the recipients' skin [22].

8.10.2 Clinical Presentation

Most HPV infections are asymptomatic and self-limited [1,41]. They remain unrecognised by patients[1]. Visible genital lesions develop rarely [41]. Disease may worsen during pregnancy [1,22,24,41].

Symptoms	Males	Females
Warty Growths in and around Genital Skin	Yes	Yes
Itch in the Infected Area	Yes	Yes
Urethral or Cervical lesions	Bleeding is possible	Yes
Anal Lesions	Yes	Yes
Rectal Bleeding after Passage of Stools	Yes	Yes
Psychological Distress	Yes	Yes
Distorted Urinary Stream	Yes	
Possible Complications	**Males**	**Females**
Malignancy	Penile, Anal, Oropharyngeal	Vulvar, Vaginal, Cervical, Anal, Oropharyngeal
Psychosexual Impact (anxiety, guilt, anger, loss of self-esteem)	Yes	Yes

Table 8.10.2: Clinical Presentation of Genital Warts [1,41,43]**.**

8.10.3 Assessment and Diagnosis

Diagnosis is usually based on the visual appearance [1,22,24] [**L1**]:

- HPV testing for low-risk genotypes is not recommended for anogenital wart diagnosis[1,21,41] [**L1, RGB**].
- Serology is relatively insensitive [21].
- Conventional culture methods cannot culture HPV [21].
- The diagnosis can be confirmed by biopsy [1] [**L1, RGA**], which is indicated in limited patient groups [1,24,41] [**L1**]:
    - Patients with atypical lesions (e.g. variable pigmentation, raised plaque-like lesions or cervical warts) [22].
    - If the diagnosis is uncertain or does not respond to treatment.

Application of dilute acetic acid is non-specific and not recommended in the routine evaluation [1,41] [**L1, RGB**].

Patients with external anal warts, may also have intra-anal warts [1]. Consider inspection of the anal canal by [1] [**L1**]:

- Digital examination.
- Standard anoscopy.
- High-resolution anoscopy.

8.10.4 Management

There is no cure for HPV [21,22]. The aim of treatment is the removal of the wart, amelioration of symptoms, and prevention of transmission [1,21]. No treatment can be recommended over the other[1,41].

Condition	Treatment Options	
	Patient-Applied	**Provider-Administered**
Men and Non-Pregnant Women	Podophyllotoxin either 0.15% cream in perianal area, introital area ,and under the foreskin or 0.5% paint on external keratinised skin topically applied, twice daily for 3 days, then 4 days off, repeated weekly for up to 4 cycles until resolution OR Imiquimod* 3.75% or 5% cream topically, 3 times per week at bedtime (wash after 6-10 hours) until resolution or up to 16 weeks OR Sinecatechins 15% ointment 3 times daily (0.5 cm strand of ointment to each wart) until resolution or up to 16 weeks	Clinician initiated cryotherapy with liquid nitrogen or cryoprobe applied weekly until resolution. OR Excision under local anaesthetic (tangential scissor excision, tangential shave excision, curettage, laser, or electrosurgery). OR Ablative therapy under general anaesthetic. OR Application of trichloroacetic acid or bichloroacetic acid 80%–90% solution applied weekly until resolution
Pregnant Women	Podophyllotoxin, podophyllin, and sinecatechins are contraindicated. Imiquimod should be avoided.	Surgical removal OR Application of trichloroacetic acid or bichloroacetic acid 80-90% solution applied weekly until resolution
Complicated or Disseminated Infection		Laser removal or diathermy

Table 8.10.4: Treatment Options for Genital Warts [1,22,24,34,41]**.**

* –Should be with care in patients with history of significant eczema or dermatitis.

Persistent intra-anal lesions in HIV positive patients should be considered for surgical excision and DNA typing [22] [**L2**]. Repeated or prolonged treatments may be required [41].

Alternative regimen may be considered ONLY if other treatment options have failed [1,41] [**L1, RGB**]. They should be applied with caution after a consultation with a specialist. Alternative therapies are often associated with more side effects and efficacy is unclear [1].

Options include [1,41]:

- Intralesional/topical interferon.
- Photodynamic therapy.
- Topical cidofovir.
- 5-fluorouracil cream.
- Podophyllin resin.

Shaving or waxing should be avoided around warts as this may facilitate local spread into areas with microtrauma [22] [**L2, RGC**].

If left untreated, anogenital warts may [1]:

- Resolve spontaneously:
    - The resolution usually occurs within 1 year [1].
    - In women, up to 30% of cases regress within 4 months [43,44]
- Remain unchanged.
- Increase in size or number.

8.10.5 Contact Tracing

Contact tracing and screening are not generally recommended [1,22] [**L1**] as the majority of partners are probably infected sub-clinically [22].

8.10.6 Test of Cure and Retesting

Test of Cure is not recommended [22] [**L2, RGB**].

Most anogenital warts respond to therapy within 3 months [1]. Rarely, treatment can result in chronic pain or painful defecation or fistulas [1]. These should be managed accordingly.

8.11 Genital Herpes Simplex

8.11.1 Aetiology

Genital herpes is a lifelong infection with periodic reactivation [21,45,46]. It is caused by one of the two HSV types [1,21,46–48]:

- HSV-1 typically causes non-STI oral herpes [21,46]. It can also be transmitted to the genitals through oral sex [46].
- HSV-2 is one of the most common causes of genital ulcers [27,46]. It is usually the cause of the recurrent genital herpes [1,47].

8.11.2 Clinical Presentation

The clinical diagnosis of genital herpes can be difficult because most initial infections are asymptomatic or atypical[22,45,46]. Approximately 30% of patients with genital herpes are symptomatic [47]. They exhibit recognised clinical features at the time of acquisition (see *Table 8.11.2*) [45,47].

Note that signs and symptoms of HSV-1 and HSV-2 overlap and can only be distinguished by the laboratory testing [46].

Symptoms	Males	Females

• Constitutional symptoms, including:
  ○ Fever.
  ○ Malaise.
  ○ Localised adenopathy.
	Yes	Yes

Recurrent anogenital ulcers or blisters	Yes	Yes
Recurrent skin splits	Yes	Yes
Erythema with itching or tingling	Yes	Yes
Urethritis	Yes	
Proctitis	Yes	
Cervicitis		Yes
Discharge		Possibly
Possible Complications	**Males**	**Females**
Neuropathic bladder (initial episode)	Yes	Yes
Aseptic meningitis	Yes	Yes
Encephalitis	Yes	Yes
Hepatitis	Yes	Yes
Pneumonitis	Yes	Yes
Psychosexual morbidity	Yes	Yes
Enhanced HIV acquisition and transmission	Yes	Yes
Acute Urinary Retention		Yes
PID		Yes
Neonatal Herpes		In the last trimester

Table 8.11.2: Clinical Presentation of HSV [21,22,24,45,46].

8.11.3 Assessment and Diagnosis

Genital HSV infection may diagnosed based on clinical grounds as a result of the presence of a cluster of vesicular lesions [1,46,47] [**L1, RGA**]. When vesicles are not present or lesions look atypical, laboratory confirmation of the diagnosis is necessary to rule out other causes of genital ulcers [21,46,47] [**L1, RGA**] and to differentiate between HSV-1 and HSV-2 as patient's prognosis and counselling are determines by the type of the virus [1,45,47] [**L1, RGA**].

The following diagnostic tests are available [21,27,47,48]:

- NAAT for viral DNA is the preferred method [1,21,27,45,47] [**L1, RGA**].
- Viral culture:
    - Low sensitivity, especially for recurrent lesions.
- Serological assays:
    - Recommended as an aid to diagnosis of genital herpes in patients with recurrent genital symptoms, atypical lesions, or with healing lesions and negative HSV cultures.
    - Test sensitivity is 39% at best; false-positive diagnosis in approximately 20% of cases.

The following diagnostic tests are not recommended [1,21,45,47] [**L1, RGB**]:

- Antigen detection:
    - Direct immunofluorescence assay.
    - Enzyme immunoassay.
    - Tzanck and Papanicolaou staining.
- IgM testing.
- IgG testing.

Screening for HSV in the general population and asymptomatic individuals is not recommended [1,22] [**L1, RGB**].

8.11.4 Management

All individuals who receive a diagnosis of genital herpes should be tested for HIV [1] [**L1, RGA**].

There is no cure for latent HSV [1]. Management of genital HSV should be aimed at both the chronic nature of the disease and on treatment of acute episodes of genital lesions [1].

- Initial episodes may be severe. Prompt treatment is recommended [1,22,46,47] [**L1, RGA**].
    - They may require a longer duration of treatment [1].
- Recurrences are usually mild or asymptomatic and may not require treatment [5,22] [**L2, RGB**].
    - Symptomatic recurrences may be treated with either suppressive (for patients with more than 9 symptomatic outbreaks a year) or episodic (for patients with infrequent less than 6- 9 outbreaks per year) therapy (see *Table 8.11.4*) [1,5,22,45,46] [**L1, RGA**].
    - The choice of treatment (suppressive therapy, episodic therapy or no therapy) depends on clinical features, including frequency and severity of recurrences [22] [**L2**].

Antiviral chemotherapy with systemic antiviral drugs is the main treatment approach (see *Table 8.11.4*) [1]. Regimens do not differ for HSV-1 and HSV-2 [45].

Condition	Treatment Options	
	First-Line	Alternative
Initial Episode	Valaciclovir 1g PO, twice daily for 7-10 days	Acyclovir 400mg PO, 3 times daily for 7-10 days OR Acyclovir 200mg PO, 5 times daily for 7-10 days OR Famciclovir 250mg PO, 3 times daily for 7-10 days
Recurrence: Episodic Therapy	Valaciclovir 500mg PO, twice daily for 3 days OR Valaciclovir 1g PO, once daily for 5 days	Acyclovir 400mg PO, 3 times daily for 5 days OR Acyclovir 800mg PO, twice daily for 5 days OR Acyclovir 800mg PO, 3 times daily for 2 days OR Famciclovir 125mg PO, twice daily for 5 days OR Famciclovir 1g PO, twice daily for 1 day. OR Famciclovir 500mg PO once, followed by 250mg PO, twice daily for 2 days.
Recurrence: Suppressive Therapy**	Valaciclovir 500mg PO, daily	Famciclovir* 250mg PO, twice daily OR Valacyclovir 1g PO, daily OR Acyclovir 400mg PO, twice daily
Severe Disease with Complications	Acyclovir 5-10mg/kg IV every 8 hours for 2-7 days or until clinical improvement, followed by oral antiviral therapy to complete at least 10 days of total therapy	
HSV Encephalitis	Acyclovir 5-10mg/kg IV, for 21 days	
Pregnant Women	Acyclovir is preferred over other medicines	
Antiviral-Resistant HSV	Foscarnet 40-80 mg/kg IV, every 8 hours until clinical resolution	Cidofovir 5 mg/kg once weekly.

Table 8.11.4: Treatment Options for HSV [1,5,22,24,45–48].
* – Famciclovir is less effective for suppression of viral shedding.
** - The need for suppressive therapy should be assessed every six month as recurrences usually become less frequent and severe [22].

Topical agents (e.g. topical acyclovir) are not usually recommended due to their low efficiency [5,45,47] [**L1, RGB**]. Topical imiquimod or cidofovir gel 1% may be considered in patients with antiviral-resistant HSV [1].

Also consider the following when required [22,47]:

- Simple analgesia and antipyretics.
- Topical lignocaine.
- Saline bathing.
- Urinating in a bath or shower relieves superficial dysuria.
- Catheterisation of neurogenic bladder.

Advise sexually active patients to use barrier protection e.g. condoms with their current partners [1,22,45,47].

8.11.5 Contact Tracing

Contact tracing is not recommended [22] [**L2, RGB**]. Symptomatic sexual partners should be evaluated and offered treatment [1] [**L1, RGA**]. Asymptomatic sexual partners should be offered type-specific serologic testing to determine the risk of acquisition [1,45] [**L1, RGA**].

8.11.6 Test of Cure and Retesting

Patients should be followed-up until the resolution of the episode [47] [**L1**]. Test of Cure and retesting are not required [22] [**L2, RGB**].

View Pathway

9 Diagnosis & Management By Syndromic Presentation

The syndromic approach to STI diagnosis and management is focused on treating signs or symptoms (syndrome) rather than treating a specific disease [**R-GDG**]:

- It is based on the identification of a group of symptoms and easily recognised signs associated with infection with well-defined pathogens.
- It allows treatment of one or more conditions that often occur at the same time and is highly effective for the management of majority of STIs.
- Prompt and efficient case detection and treatment, results in immediate health benefits for individual patients. Reducing the duration of patients' infectiousness decreases the incidence and prevalence of STIs in the population.
- However, the approach tends towards over-treatment, rather than under-treatment, and may cause drug resistance.
- Nevertheless, syndromic management is accepted as the management approach of choice.

9.1 Urethritis in Males

9.1.1 Aetiology

Urethritis is inflammation of the urethra [1]. Possible causative pathogens include [1,2,22,39]:

- Most common:
  - *C. trachomatis.*
  - *M. genitalium.*
  - *N. gonorrhoeae.*
- Less common:
  - HSV.
  - Adenoviruses.
  - *T. vaginalis.*

Ureaplasma urealyticum is considered normal urethral flora [2,22].

9.1.2 Clinical Presentation

Urethritis in males is typically presented with [1,2,5,6,22,39]:

- Urethral pruritis.
- Urethral discharge:
  - Usually copious and purulent in gonorrhoea.
  - Usually less discharge in non-gonococcal infections.
- Dysuria.
- Urinary frequency (suggestive of bladder infection).
- Urgency.
- Feeling of heaviness in the genitals.

9.1.3 Assessment and Diagnosis

Urethritis should be specified as either gonococcal or non-gonococcal urethritis (NGU) [1].
NGU is defined as the presence of [5,39]:

- Urethritis; and/or
- ≥5 polymorphonuclear leukocytes per oil immersion field (x1000) in >5 non-adjacent, randomly selected fields in a smear of urethral secretions (if point of care microscopy available); and

- Absent gram-negative intracellular diplococci on gram stain of urethral secretions (if point of care microscopy available); and
- Negative tests or no tests performed for chlamydia and gonorrhoea.

The following basic tests recommended for the diagnosis [1,39]:

- First pass urine for NAAT if dysuria is present.
- Urethral swab for microscopy and culture, if any discharge or a urethral swab can be collected.

Additional tests may be considered in MSM patients [22] [**L2**]:

- Rectal swabs and culture for chlamydia and gonorrhoea.
- Throat swab and culture for gonorrhoea.
- Blood test for syphilis, HIV, HAV and HBV.
- Consider testing for HCV, if:
    - There is a history of injecting drug use.
    - Patient is HIV positive.

Recurrent NGU is defined as the recurrence of symptomatic urethritis occurring 30-90 days following treatment of acute NGU [39]. The following tests should be considered in patients with persistent/recurrent NGU [39] [**L1, RGA**]:

- NAAT for *M. genitalium* and screening for macrolide resistance.
- NAAT for *T. vaginalis*.

9.1.4 Management

Men who receive a diagnosis of NGU should be tested for HIV and syphilis [1]. Patients with urethritis and their sexual partners referred for evaluation, should receive the appropriate treatment when required (see *Table 9.1.4*) [1,39] [**L1, RGA**].

Condition	Antimicrobial Recommendations	
	First-Line	Alternative
NGU likely	Doxycycline 100mg PO, twice daily for 7 days OR Azithromycin* 1g PO, stat.	Erythromycin base 500mg PO, 4 times daily for 7 days OR Erythromycin ethylsuccinate 800mg PO, 4 times daily for 7 days OR Levofloxacin 500mg PO, daily for 7 days OR Ofloxacin 300mg PO, twice daily for 7 days
Known organism	See *Section 8* for Treatment according to Causative Organism.	

Table 9.1.4: Treatment Options for Urethritis in Males [1,39]**.**

* - Azithromycin should not be used routinely because of the increased risk of inducing macrolide antimicrobial resistance.

Patients with persistent urethritis or pain should be referred to a urologist [1,22] [**L1, RGA**].
Advise sexually active patients to [1,22,39]:

- Avoid sexual contact for 7 days after treatment.
- Avoid sex with partners from the last 6 months until the partners have been tested and treated.

9.1.5 Contact Tracing

Sexual partners of patient with confirmed gonorrhoea and chlamydia should be traced [22] [**L2**]. All sexual partners of men with non-gonococcal urethritis within the preceding 60 days should be referred for evaluation, testing, and presumptive treatment regardless of symptoms or signs [1,5] [**L1**].

9.1.6 Follow-Up and Test of Cure

For follow-up and TOC recommendation refer to relevant Sections:

- *N. gonorrhoeae* (see *Section 8.2.6*).
- *C. trachomatis* (see *Section 8.3.6*).
- *M. genitalium* (see *Section 8.8.6*).
- *T. vaginalis* (see *Section 8.9.6*).
- HSV (see *Section 8.11.6*).

9.2 Cervicitis

9.2.1 Aetiology

Cervicitis is an inflammation of the cervix defined clinically by the presence of cervical ectopy and/or a friable cervix with easily induced bleeding at the cervical os and/or mucopurulent discharge at the cervical os [1,5,22].

Mucopurulent cervicitis is defined as cervicitis and negative test results or no tests performed for chlamydia and gonorrhoea [5].

Possible causative pathogens include [1,2,22]:

- Most common:
  - *C. trachomatis.*
  - *N. gonorrhoeae.*
- Less common:
  - *M. genitalium.*
  - *T. vaginalis.*
  - HSV.

9.2.2 Clinical Presentation

Cervicitis is frequently asymptomatic but the following two symptoms may be presented in some patients [1,2,6,22]:

- Vaginal discharge:
- Intermenstrual or post-coital vaginal bleeding.

Cervicitis may be a sign of endometritis. Assessment for PID should be considered [1,22] especially in the presence of the following symptoms [22]:

- Uterine tenderness.
- Adnexal tenderness.
- Cervical motion tenderness on pelvic exam.

9.2.3 Assessment and Diagnosis

Speculum examination to view cervix should be performed [5,22] [**L1, RGA**].
A cervical swab is the minimal diagnostic test required for cervicitis [**R-GDG**].

Infection	Site/Specimen	Test
Chlamydia	Endocervical swab	NAAT
Gonorrhoea	Endocervical swab	NAAT. If positive, a swab should be taken at relevant sites for culture
Trichomoniasis	High vaginal swab or first pass urine	NAAT and pH test
M. genitalium	Endocervical swab	NAAT
Herpes*	Cervical swab	NAAT

Table 9.2.3: Diagnostic Tests for Cervicitis [1,22]**.**
* - If cervical ulcers are present.

Note:

- Leukorrhea (>10 WBC per high-power field on microscopic examination of vaginal fluid) may be suggestive of chlamydial and gonococcal infection of the cervix [1].
- It is not always possible to identify a pathogen in women with cervicitis, who are at low risk of STIs [22]. In such patients, cervicitis may be due to exposure to chemical irritants (e.g. spermicides or deodorants).

9.2.4 Management

Women with cervicitis should be tested for HIV and syphilis [1]. If cervicitis is found incidentally on vaginal examination (e.g. PAP smear), consider testing for other STIs, especially in patients from a high risk group[1,22]:

- <25 years old.
- With history of STI.
- With a recent new partner.
- With >1 partner in last 12 months.

Treatment at initial assessment is recommended in women with cervicitis who are at increased risk for STIs (see *Table 9.2.4*) even if a pathogen have not been yet identified [22] [**L2, RGA**].

Condition	Antimicrobial Recommendations	
	First-Line	Alternative
Unknown Organism	Doxycycline 100mg PO, twice daily for 7 days	Azithromycin 1g PO, stat*
Another Known Organism	See *Section 8* for Treatment according to Causative Organism.	

Table 9.2.4: Treatment Options for Cervicitis [1,5,22]**.**

* - Azithromycin should not be used routinely because of the increased risk of inducing macrolide antimicrobial resistance.

No recommendation can be given regarding the management of persistent cervicitis in the absence of STI reinfection, bacterial vaginosis and after treatment of partners [22] [**L2, RGA**]. Such patients should be referred to an STI specialist for further management [5] [**L2, RGA**].

Advise sexually active patients to avoid sexual contact for 7 days after treatment or until they and their partner(s) are treated [1,22] [**L1, RGA**].

9.2.5 Contact Tracing

Contact tracing should be performed for all patients with chlamydia, gonorrhoea, trichomoniasis, and *M. genitalium* infections [22]. All sexual partners in the past 60 days should be evaluated and referred for testing [1,5]. Contact tracing for herpes is not recommended [22] [**L2, RGB**].

All sexual contacts should be offered treatment [1,22] [**L1, RGA**].

9.2.6 Follow-Up and Test of Cure

Follow-up:

- Routine follow up is not required [22] [**L1, RGB**] but may be provided if another STI or symptoms of PID have been identified [22] [**L2, RGA**]. If PID diagnosed, assess response to antibiotics after 7 days [22] [**L1**].
- Mucopurulent cervicitis due to an ectropion will often persist despite treatment. Further treatment is not required [22] [**L2, RGB**].

Test of Cure:

- Patients with cervicitis due to chlamydia, gonorrhoea, or trichomoniasis should be tested for reinfection 3 months after treatment [1] [**L3, RGA**].

9.3 Vaginal Discharge

9.3.1 Aetiology

Women of reproductive age may have normal physiological discharge [22]. If an abnormal vaginal discharge is present, consider one of the following conditions:

Infections Not Associated with Sexual Transmission [1,21,22,49,50]:

- Bacterial vaginosis is a polymicrobial non-inflammatory clinical syndrome composed of a multiplex array of different anaerobic bacteria in high quantities [1,50,51]:
  - *Prevotella* sp.
  - *Mobiluncus* sp.
  - *Gardnerella vaginalis*.
  - Ureaplasma.
  - Mycoplasma.
  - *Peptostreptococcus.*
  - *Fusobacterium.*
  - *Eubacterium* spp.
  - Numerous fastidious or uncultivated anaerobes.
- Aerobic vaginitis is a vaginal infectious condition due to overgrowth of one or two enteric commensal flora bacteria [50]:
  - Group B streptococci (e.g. *Streptococcus agalactiae*).
  - *Staphylocuccus aureus.*
  - *Escherichia coli.*
  - Mixed infections.
- Candidiasis due to overgrowth of:
  - *Candida albicans*.
  - *Candida glabrata.*
  - Other yeasts.

Sexually Transmitted Infections [1,22,49]**:**

- Gonorrhoea (see *Section 8.2*).
- Chlamydia (see *Section 8.4*).
- *M. genitalium* (see *Section 8.8*).
- Trichomoniasis (see *Section 8.9*).
- HSV (see *Section 8.11*).

Other Non-Infectious Causes [1,22,49]:

- Hormonal contraception.
- Cervical ectropion and cervical polyps.
- Malignancy.
- Foreign body (e.g. retained tampon).
- Vulval dermatoses.
- Fistulae.
- Irritant or allergic reaction.
- Erosive lichen sclerosis.
- Desquamative inflammatory vaginitis.
- Atrophic vaginitis in lactating and postmenopausal women.

View Pathway

9.3.2 Clinical Presentation

The consistency of the discharge can often suggest the nature of the disease (see *Table 9.3.2*) [2]. Systemic symptoms can suggest an upper genital tract infection (UGTI) [22]. Patients may have psychosexual problems, especially in case of recurrent episodes of vaginal discharge and/or vulval burning [49].

Condition	Discharge	Bleeding * (Intermenstrual or Postcoital)	Itch	Superficial Dyspareunia	Deep Dyspareunia	Lower Abdominal Pain #	Dysuria
No infection	White or Clear Non-Offensive						
Bacterial Vaginosis	Thin & homogeneous Coating Vaginal Walls Grey-White Coloured Offensive, Fishy Odour	Yes					
Aerobic vaginitis	Purulent		Burning or stinging Erythema	Yes		Rare (if ulceration present)	Fissuring
Candidiasis	Thick or Curdy White Non-Offensive		Soreness Erythema	Yes			Yes
Chlamydia	Minimal Discharge; or Purulent	Yes			Yes	Yes	Yes
Gonorrhoea	Purulent	Yes			Yes	Yes	
M. genitalium	Minimal Discharge; or Purulent	Yes			Yes	Yes	Possibly

View Pathway

Condition	Discharge	Bleeding * (Intermenstrual or Postcoital)	Itch	Superficial Dyspareunia	Deep Dyspareunia	Lower Abdominal Pain #	Dysuria
Trichomoniasis	Scanty to Profuse Green/Yellow Offensive Frothy		Erythema			Rarely	Yes
Cervical ectropion	Yes	Yes					
Polyps	Yes	Yes					
Malignancy	Yes	Yes					
Dermatitis	Yes		Vulvogenital	Yes			External Fissuring
Lichen sclerosis	Yes			Yes			
Herpes	Yes		Yes				External Fissuring

Table 9.3.2: Clinical Features of Diseases characterised by Vaginal Discharge [1,21,22,49,51].

* - Suggestive of PID.

- Suggestive of UGTI.

9.3.3 Assessment and Diagnosis

Medical history alone is insufficient for accurate diagnosis[1] [**L1, RGC**]. The following is required to determine the aetiology of vaginal symptoms [1,22,51] [**L1**]:

- Detailed history.
- Physical examination, including:
  - Speculum examination of cervix and vagina.
  - Bimanual palpation.
- Laboratory testing (see *Table 9.3.3*).

Note:

- Testing is not required in asymptomatic women [49] [**L1, RGB**].
- In patents with signs of vulvar inflammation and absence of vaginal pathogens, non-infectious causes of vulvovaginal signs or symptoms should be considered (see *Section 9.3.1*) [1].

Condition	Site/Specimen	Test
Bacterial Vaginosis	Vaginal Swab	Microscopy & Gram Stain. Whiff test with 10% potassium hydroxide (KOH)*. pH test **. Microscopy of fresh discharge samples. Other commercial tests, when available.
Aerobic Vaginitis	Vaginal Swab	Microscopy & Culture. Molecular Detection.
Candidiasis	High or Self-Collected Vaginal Swab	Microscopy & Gram Stain. Culture.
STI	Endocervical Swab, Self-Collected Vaginal Swab, or First Pass Urine	See Relevant Sections for Test Recommendations.

Table 9.3.3: Diagnostic Tests for Diseases Characterised by Vaginal Discharge [1,21,22,49]**.**
* - Fishy odour of vaginal discharge before or after addition of 10% KOH suggests bacterial vaginosis [1].
** - pH>4.5 suggests bacterial vaginosis or trichomoniasis [1,21,22,51].

9.3.4 Management

All patients with bacterial vaginosis should be tested for HIV and other STIs [1,22] [**L1**]. Treatment options should be selected based on the identified cause (see *Table 9.3.4*) [22].

Probiotics are not currently recommended for the treatment of bacterial vaginosis [49] [**L1, RGB**].

Consider referral to a specialist in the following cases [1,22] [**L1, RGA**]:

- Systemically unwell.
- Persistent symptoms.
- Complicated presentation.
- Unclear aetiology.

Advise sexually active patients to avoid sexual contact until they and their partner(s) are treated [**R-GDG**].

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
Bacterial Vaginosis In Non-Pregnant Women	Metronidazole 400-500mg PO, twice daily for 5-7 days OR Metronidazole gel 0.75%, one full applicator (5g) intravaginally, once daily for 5 days OR Clindamycin cream 2%, one full applicator (5g) intravaginally at bedtime for 7 days	Metronidazole 2 g PO in a single dose OR Tinidazole 2g PO once daily for 2 days OR 1g once daily for 5 days OR Clindamycin* 300mg PO, twice daily for 7 days OR ovules 100mg intravaginally, once at bedtime for 3 days OR Dequalinium chloride 10mg vaginal tablet, one daily for 6 days	Alcohol should be avoided during metronidazole and tinidazole treatment [1,22,40] and for at least 48h (72h for tinidazole [1]) thereafter [40]. Avoid high doses of metronidazole in breastfeeding because it is secreted in breast milk.
Bacterial Vaginosis In Pregnant or Lactating Women	Metronidazole 250-500mg PO, twice daily for 5-7 days	Clindamycin 300mg PO, twice daily for 7 days	No recommendation regarding treatment of asymptomatic women
Recurrent Bacterial Vaginosis In Pregnant and Non-Pregnant Women	Metronidazole 500mg PO, twice daily for 10-14 days	Metronidazole gel 0.75%, one applicator (5g) intravaginally, once daily for 10 days, followed by metronidazole gel twice a week for 4-6 months OR Metronidazole or tinidazole 500mg PO, twice daily for 7 days followed by intravaginal boric acid 600mg daily for 21 days and then suppressive 0.75% metronidazole gel twice weekly for 4-6 months OR Monthly metronidazole 2g PO administered with fluconazole 150mg	Intravaginal agents should be avoided in pregnancy [5]. Avoid high doses of metronidazole in breastfeeding because it is secreted in breast milk.
Aerobic or D**esquamative Inflammatory Vaginitis**	Clindamycin cream 2%, one full applicator (5 g) intravaginally at bedtime for 7-21 days	Combination of intravaginal clindamycin and intravaginal steroids (e.g. hydrocortisone 300-500mg) for 7-21 days	In cases with a significant atrophy component, local oestrogens can be added.
Vulvovaginal Candidiasis In Non-Pregnant Women	**Over-the-Counter Intravaginal Agents *:** Clotrimazole 1% cream 5g intravaginally daily for 7-14 days OR 2% cream daily for 3 days OR Miconazole 2% cream 5g intravaginally daily for 7 days OR 4% cream daily for 3 days OR Miconazole 100mg one vaginal suppository daily for 7 days OR 200mg suppository for 3 days OR 1,200mg suppository once		Treatment is recommended only if symptomatic.

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
	OR Tioconazole 6.5% ointment 5g intravaginally once **Prescription Intravaginal Agents *:** Butoconazole 2% cream (single dose bioadhesive product), 5g intravaginally in a single application OR Terconazole 0.4% cream 5g intravaginally daily for 7 days OR 0.8% cream daily for 3 days OR 80mg one vaginal suppository daily for 3 days **Oral Agent:** Fluconazole 150 mg PO as a single dose OR Itraconazole 200mg PO, twice daily for 1 day		
Vulvovaginal Candidiasis In Pregnant or Lactating Women	Topical azole for 7 days	Fluconazole 150 mg PO as a single dose	Treatment is recommended only if symptomatic. Fluconazole is contraindicated in pregnancy but may considered an option in breastfeeding women
Severe Vulvovaginal Candidiasis	Topical azole for 7-14 days OR Fluconazole 150mg PO, in two sequential doses (second dose 72 hours after the initial dose)		
Recurrent Vulvovaginal Candidiasis	Topical therapy for 7–14 days OR Fluconazole 100mg, 150mg, or 200mg PO, every third day for a total of 3 doses		Longer duration of initial therapy is recommended
Non-Albicans Vulvovaginal Candidiasis	Non-fluconazole azole (oral or topical) for 7–14 days	Boric acid 600mg in a gelatine capsule, vaginally once daily for 2 weeks	The optimal treatment is unknown.
STI	Refer to Relevant Section under Section 8		

Table 9.3.4: Treatment Options for Vaginal Discharge [1,5,24,49,51]**.**

* - Topical/intravaginal agents are oil-based and may cause latex condoms or diaphragms to fail [1,5,22,49].

9.3.5 Contact Tracing

Contact tracing is not required for HSV and non-STIs [22] [**L2**]. Sexual partners of patients with STIs should be traced back. Refer to relevant sections for recommendations and tracing periods:

- *N. gonorrhoeae* (see *Section 8.2.5*).
- *C. trachomatis* (see *Section 8.4.5*).
- *M. genitalium* (see *Section 8.8.5*).
- *T. vaginalis* (see *Section 8.9.5*).

Routine treatment of male sexual partners of patients diagnosed with bacterial vaginosis or candidosis is not recommended [1,5,49] [**L1, RGB**] but may be considered if the male partner has symptoms (e.g. balanitis, pruritus or irritation) [1,5]. The recommended treatment is a topical azole cream twice daily for 7 days [5] [**L2, RGA**].

9.3.6 Follow-Up and Test of Cure

Follow-up:

- Follow-up visits are not required for patients with non-STIs if symptoms resolve [1] [**L1**].
- If bacterial vaginosis was treated in pregnancy, the patient should be retested after 1 month and further treatment offered if required [49] [**L1, RGA**].

For TOC recommendations refer to relevant sections:

- *N. gonorrhoeae* (see *Section 8.2.6*).
- *C. trachomatis* (see *Section 8.4.6*).
- *M. genitalium* (see *Section 8.8.6*).
- *T. vaginalis* (see *Section 8.9.6*).
- HSV (see *Section 8.11.6*).

9.4 Genital Ulcer Diseases

9.4.1 Aetiology

Genital ulcers may be located in the genital, anorectal or perineal areas [52]. They can be classified as [22,52]:

Infectious ulcers, causes include:

- STIs:
  - Genital HSV (the most common cause in developed countries [2]).
  - Chancroid (the most common cause in developing countries [2]).
  - Syphilis (the second most common cause in developed & developing countries [2]).
  - LGV.
  - Donovanosis.
- Secondary bacterial.
- Fungal:
  - *Candida* spp.

Non-Infectious Ulcers, causes include:

- Behcet syndrome (the most common cause in Middle East and Asia [52]).
- Fixed drug eruption.
- Psoriasis.
- Sexual trauma.
- Wegener granulomatosis.
- Aphthous ulcers.
- Carcinoma.
- Crohn's disease.
- Bollus pemphigoid.

9.4.2 Clinical Presentation

The appearance and clinical features of ulcers can often suggest the nature of the disease (see *Table 9.4.2*).

Condition	Symptoms
HSV	• Ulcers are commonly painful. • Preceded by prodromal symptoms. • Commence as vesicles. • Inguinal nodes often tender.
Syphilis	• The chancre lesion of primary syphilis. • Single, less painful, indurated ulcer with a clean base. • Lesions can be painful if super-infected by other microbes. • If untreated, the genital ulcer disappears. • Non-tender lymphadenopathy may be present.
Chancroid	• Ulcerations are usually non-indurated. • Lesions are painful and often multiple n direct opposition to each other. • Lesions have serpiginous border surrounding a friable base covered with a necrotic and often purulent exudate. • A painful and extremely tender unilateral inguinal adenitis may pe present. These may form buboes. • In men, the ulcer is located primarily on the prepuce and around the coronal sulcus. • In women, the fourchette, labia and perianal area can be involved.
LGV	• Painless papule that is frequently unnoticed. • Regional lymph nodes may be enlarged.

Condition	Symptoms
Donovanosis	• Painless papule. • Painless, raised, beefy-red lesion.
Behcet Syndrome	• Minor aphthous ulcers (round and less than 10 mm in diameter).

Table 9.4.2: Clinical Features of Diseases Characterised by Genital Ulceration [2,22,52]**.**

9.4.3 Assessment and Diagnosis

Diagnosing the cause of genital ulcer disease should be based on history and physical examination; laboratory findings may be performed when required [52]. Cultures are usually required to confirming the diagnosis because clinical symptoms of the genital ulcer diseases frequently overlap and because several pathogens may be present simultaneously [2].

For detailed information on diagnosis of each individual infection, refer to corresponding topics:

- Syphilis (see *Section 8.3.3*).
- Chancroid (see *Section 8.5.3*).
- LGV (see *Section 8.7.3*).
- HSV (see *Section 8.11.3*).

9.4.4 Management

For detailed information on Management of Infectious Ulcers, refer to corresponding topics:

- Syphilis (see *Section 8.3.4*).
- Chancroid (see *Section 8.5.4*).
- LGV (see *Section 8.7.4*).
- HSV (see *Section 8.11.4*).

The Management of Non-Infectious Ulcers includes the following treatment options [52] [**L1, RGB**]:

- Topical treatments (e.g. pastes, gels, sprays, injections, laser, locally dissolving tablets).
- Topical antimicrobials.
- Topical or oral anti-inflammatory agents.
- Topical or oral analgesics.
- Cool compresses with Burow's (aluminium triacetate) solution.
- Perineal cool water or saline bath.

Note:

- Consider biopsy in patient with persistent ulcer(s) to help identify other causes and to exclude skin cancer [22,52] [**L1**].
- Advise sexually active patients to avoid sexual contact until they and their partner(s) are treated [**R-GDG**].

View Pathway

9.4.5 Contact Tracing

Contact tracing is not required for HSV and non-STIs [22] [**L2**]. Sexual partners of patients with STIs should be traced back.

Refer to relevant sections for recommendations and tracing periods:

- Syphilis (see *Section 8.3.5*).
- Chancroid (see *Section 8.5.5*).
- LGV (see *Section 8.7.5*).
- HSV (see *Section 8.11.5*).

9.4.6 Follow-Up and Test of Cure

Follow-up visits are not required for patients with non-STIs if symptoms resolve [1] [**L1**].

For TOC recommendations refer to relevant sections:

- Syphilis (see *Section 8.3,6*).
- Chancroid (see *Section 8.5.6*).
- LGV (see *Section 8.7.6*).
- HSV (see *Section 8.11.6*).

9.5 Pelvic Inflammatory Disease

9.5.1 Aetiology

PID is an infection of the upper genital tract resulting from ascending vaginal or cervical infections [2,53]. In comprises a spectrum of inflammatory disorders and any combination of them, including [1,22,54]:

- Endometritis.
- Salpingitis.
- Parametritis.
- Oophoritis.
- Tubo-ovarian abscess.
- Pelvic peritonitis.

Possible causes of PID include [1,22,53]:

- STIs (the most frequent non-idiopathic cause [53]):
  - Gonorrhoea.
  - Chlamydia.
  - *M. genitalium.*
- Bacterial vaginosis.
- Vaginal facultative bacteria ascending to the upper genital tract.
- Polymicrobial infections.
- Cytomegalovirus.
- Idiopathic cause (up to 70% of cases [22]).

9.5.2 Clinical Presentation

Clinical presentation varies in symptoms and their severity (see *Table 9.5.2*) [22,53]. Some patients may be asymptomatic or may have subtle or non-specific symptoms [1,53].

Symptoms	Possible Complications
• Lower abdominal pain. • Vaginal or cervical discharge. • Pruritus. • Increased urinary frequency. • Dysuria. • Deep dyspareunia. • Vaginal or uterine bleeding. • Fever, nausea, vomiting in severe infection.	• Infertility. • Ectopic pregnancy. • Chronic pelvic pain. • Perihepatitis (Fitz-Hugh–Curtis syndrome).

Table 9.5.2: Clinical Features of PID [1,2,22,53,54]**.**

9.5.3 Assessment and Diagnosis

Sexually active women with new onset abdominal pain should have the following investigations [22,53] [**L1**]:

- Blood test.
- Urine pregnancy test.
- Pelvic ultrasound.
- Testing for STIs.
- Urinalysis.

The following investigations may be considered but should be reserved for patients with diagnostic uncertainty or concern for complications [22,53,54] [**L1**]:

- Imaging studies:
  - Transvaginal sonography (e.g. Doppler ultrasonography).
  - Computed tomography (CT).
  - Magnetic resonance imaging (MRI).
- Invasive studies:
  - Diagnostic laparoscopy.
  - Endometrial biopsy.

The diagnosis of PID is clinical [1,22,53]. It should be based on history and physical examination[22]. Due to the wide variation in symptoms and signs associated with this condition, a low threshold of suspicion should be maintained [1,22,54] [**L1, RGA**].

A presumptive diagnosis of PID can be made if [1,53] [**L1, RGA**]:

- No cause for the illness other than PID can be identified; and
- At least one of the following *minimum clinical criteria* are present:
  - Cervical motion tenderness.
  - Uterine tenderness.
  - Adnexal tenderness.
- *Additional criteria* enhance the specificity of the minimum clinical criteria and support a diagnosis of PID. These include:
  - Fever >38.3°C.
  - Abnormal cervical mucopurulent discharge or cervical friability.
  - Abundant number of white blood cells on saline microscopy of vaginal fluid.
  - Elevated erythrocyte sedimentation rate.
  - Elevated C-reactive protein.
  - Confirmed infection with *N. gonorrhoeae* or *C. trachomatis*.

Consider alternative diagnoses [1,53,54]:

- Surgical emergencies (e.g. acute appendicitis).
- Ectopic pregnancy or rupture.
- Endometriosis.
- Endometritis.
- Complications of an ovarian cyst (rupture or torsion).
- Tubo-ovarian abscess.
- Ureteral calculus.
- Irritable bowel syndrome.
- Urinary tract infection.
- Functional pain (pain of unknown physical origin).

9.5.4 Management

All women who receive a diagnosis of acute PID should be tested for HIV, gonorrhoea, chlamydia, *M. genitalium*, syphilis [1,53,54] [**L2**].

Prompt treatment (see *Table 9.5.4*) is recommended to prevent long term sequelae and potential complications [1,22,54] [**L1, RGA**]. It should be initiated as soon as the presumptive diagnosis has been made; waiting for test results is not required [1,22,53] [**L1, RGA**].

Note:

- Treatment regimens must provide empiric, broad spectrum coverage of likely pathogens [1,54].
- They should also be effective against *N. gonorrhoeae*, *C. trachomatis,* and anaerobic infection [1,54].
- No treatment can be recommended over the other [1,54].

Admission is required for patients with conditions listed below [1,5,22,53] [**L1, RGA**]. IV antibiotic regimens (see *Table 9.5.4*) may be considered in such patients [53,54] [**L1, RGA**]. IV antibiotics should be continued until 24h after clinical improvement and then switched to oral [54] [**L2, RGB**].

- Uncertain diagnosis.
- A surgical emergency (e.g. appendicitis) cannot be excluded.
- Suspicion or definitive diagnosis of a pelvic (tubo-ovarian) abscess.
- Intractable abdominal pain.
- Severe illness, nausea and vomiting, or high fever.
- Intolerance to oral therapy.
- Penicillin allergy.
- No clinical response to oral antimicrobial therapy.
- Pregnancy.
- Youth or adolescent.
- Immunocompromised status (e.g. HIV infection).

Condition	Antimicrobial Recommendations		Notes
	First-Line	Alternative	
Mild to Moderate Outpatient IM or Oral regimens	Ceftriaxone 250mg IM, stat OR Cefoxitin 2g IM, and Probenecid 1g PO, administered concurrently in a single dose OR other parenteral cephalosporins (e.g. ceftizoxime, cefotaxime) + Metronidazole 400-500mg PO, twice daily for 14 days + Doxycycline* 100mg PO, twice daily for 14 days	Levofloxacin 500mg PO, once daily for 14 days OR Ofloxacin 400mg PO, twice daily WITH or WITHOUT Metronidazole 400-500mg PO, twice daily for 14 days OR Moxifloxacin 400mg PO, once daily for 14 days	Alcohol should be avoided during metronidazole treatment [1,22,40] and for at least 48h thereafter [40]. If *M. genitalium* infection is confirmed treatment with moxifloxacin is preferred [22,54]. Doxycycline* is contraindicated in pregnant women [1,5].
Severe Inpatient Parenteral Regimen	Cefotaxime 2g IV, 3 times daily + Azithromycin 500mg IV, daily + Metronidazole 400-500mg IV, twice daily	Ampicillin/Sulbactam 3g IV, every 6 hours + Doxycycline** 100mg PO or IV, every 12 hours	Doxycycline* is contraindicated in pregnant women [1,5].

Table 9.5.4: Treatment Options for PID [1,5,22,52,54]**.**

* - Doxycycline may be replaced with azithromycin 1g PO, as a further single dose 1 week later [22].

** - If oral doxycycline is tolerated, it is preferred over parenteral administration [1,53].

Antibiotic therapy should be given for 10-14 days [54] [**L2**]. Response to treatment can be monitored by changes in C-reactive protein and white cell count [54]. Simple analgesia (e.g. Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), paracetamol) should be provided when required [1,22,53] [**L1**].

In patients who do not clinically improve after >72 hours of recommended treatment:

- Re-evaluate to confirm the diagnosis. If confirmed, administered IV therapy [1].
- Remove intrauterine device if present [22,54].
- Consider alternative diagnoses (see *Section 9.5.3*)[53].

Advise sexually active patients to avoid sexual contact until they and their partner(s) are treated [1,22,53] [**L1**].

9.5.5 Contact Tracing

Contact tracing is not required for non-STIs PID [**R-GDG**]. Sexual partners of patients with STIs should be traced back. Refer to relevant sections for recommendations and tracing periods:

- Syphilis (see *Section 8.3.5*).
- Chancroid (see *Section 8.5.5*).
- *M. genitalium* (see *Section 8.8.5*).
- Bacterial vaginosis (see *Section 9.3.5*).

9.5.6 Follow-Up and Test of Cure

Follow-up:

- Clinical response to treatment and treatment tolerance should be determined at the follow-up visit within 48-72h after hospital discharge or initiation of outpatient treatment [5,53,54] [**L1**].
- Further review should occur at 1-2 weeks [22].

TOC:

- All women with the diagnosis of PID due to chlamydial or gonococcal infection should be retested 3 months after treatment [1,53].
- Also see TOC and retesting recommendations in the relevant sections:
    - Syphilis (see *Section 8.3.6*).
    - Chancroid (see *Section 8.5.6*).
    - *M. genitalium* (see *Section 8.8.6*).
    - Bacterial vaginosis (see *Section 9.3.6*).

9.6 Epididymitis and Epididymo-Orchitis

9.6.1 Definitions and Aetiology

Definitions:

- Epididymitis is inflammation of the epididymis accompanied by pain and swelling [1].
- If the testis become involved the condition is referred as epididymo-orchitis [1,22,55].
- Orchalgia/epididymalgia is a non-infectious epididymitis [1].

Possible causes of epididymo-orchitis include [1,22,55–57]:

- STIs:
  - *C. trachomatis.*
  - *N. gonorrhoeae.*
  - *M. genitalium.*
  - Gram-negative enteric organisms (e.g. *Escherichia coli* and *Proteus* spp.)
- Non-STI uropathogens:
  - Paramyxovirus (mumps).
  - *Mycobacterium tuberculosis*.
  - Candida.
  - Brucellosis.
  - Cryptococcosis.
  - Fournier's gangrene.
- Non-infectious causes:
  - Medications (e.g. amiodarone).
  - Behcet's disease.
  - Tumour.
  - Sarcoidosis.
  - Idiopathic.

STIs is the most frequent cause of the scrotal swelling in sexually active men <35 years old [1,22]. In patients >35 years old who do not practice insertive anal intercourse, the most common cause is bacteriuria secondary to prostatic hypertrophy [1,57].

9.6.2 Clinical Presentation

Sexually transmitted acute epididymitis is typically presented with [1,22,55,56]:

- Unilateral testicular pain with sudden onset and tenderness.
- Positive Prehn sign (pain alleviated by lifting the scrotum).
- The pain may radiate into the lower abdomen.
- Dysuria and/or haematuria.
- Urinary frequency.
- Urethral discharge.
- Penile irritation.
- Hydrocele.
- Palpable swelling of the epididymis.
- Tender and swollen the spermatic cord.
- Erythema with or without oedema of scrotum.
- Urethritis (may be asymptomatic).
- Fever.

Suprapubic pain, frequency, and nocturia suggest urinary pathogen rather than STI [22].

Possible complications include [55]:

- Hydrocele.
- Abscess and infarction of the testicle.
- Infertility.

9.6.3 Assessment and Diagnosis

All patients with suspected acute epididymitis should be [1,22,56] [**L1**]:

- Physically examined to determine exact site and nature of symptoms.
- Evaluated for the presence of inflammation:
    - Gram or methylene blue or gentian violet stain of urethral secretions.
    - Leukocyte esterase test on first pass urine.
    - Microscopic examination of sediment from a spun first pass urine.
- Tested for gonorrhoea (see *Section 8.2.3*) and chlamydia (see *Section 8.4.3*).

The following investigations are not routinely recommended [1] [**L1, RGB**] but may be considered in patients with scrotal pain who cannot receive an accurate diagnosis by clinical findings or in patients suspected for spermatic cord (testicular) torsion:

- Ultrasound examination (e.g. color Doppler ultrasonography) [1,22,55,56].
- Radionuclide scanning of the scrotum [1].

If epididymitis or epididymo-orchitis due to an STI is suspected, see also corresponding section for the condition specific diagnosis:

- *N. gonorrhoeae* (see *Section 8.2.3*).
- *C. trachomatis* (see *Section 8.4.3*).
- *M. genitalium* (see *Section 8.8.3*).

If the diagnosis of epididymitis or epididymo-orchitis is uncertain, consider alternative diagnoses and referral to a urologist for review [1,22,55,56].

Other possible causes of scrotal pain include:

- Spermatic cord (testicular) torsion (surgical emergency).
- Torsion of appendix testis.
- Testicular cancer.
- Fournier's gangrene:
    - Refer to NCG on the *Diagnosis and Management of Skin and Soft Tissue Infection* published by the Ministry of Public Health of Qatar [58].

9.6.4 Management

All patients suspected for epididymitis or epididymo-orchitis should be tested for HIV and other STIs [1,55]. They should be presumptively treated for gonorrhoea and chlamydia before all laboratory test results available[1,22] [**L1, RGA**].

The treatment includes empiric antibiotics selected according to the likelihood of an STI or uropathogen (see *Table 9.6.4*).

Condition	Treatment
Acute Epididymitis If most likely to be caused by Chlamydia, Gonorrhoea or *M. genitalium*	See Relevant Sections of this Guideline for treatment recommendations
Acute Epididymitis If most likely to be caused by Chlamydia, Gonorrhoea, and enteric organisms	Ceftriaxone 250mg IM, in a single dose + Levofloxacin 500mg PO, once daily for 10-14 days or Ofloxacin 300mg PO, twice daily for 10-14 days [**R-GDG**].
Acute Epididymitis If most likely to be caused by enteric organisms	Levofloxacin 500mg PO, once daily for 10 days OR Ofloxacin 200-300mg PO, twice daily for 10-14 days
Idiopathic Chronic Epididymitis	NSAIDs with scrotal icing and elevation for 14 days. If symptoms persist, consider adding a tricyclic antidepressant or neuroleptic (e.g. gabapentin).

Table 9.6.4: Treatment Options for Epididymitis or Epididymo-orchitis [1,5,55,56]**.**

Scrotal support, appropriate analgesia and anti-inflammatory medications should be provided when required [22,56] [**L2**].

Advise sexually active patients to:

- Avoid sexual contact for 7 days after treatment is administered [22].
- Avoid sex with partners from the last 6 months until the partners have been reviewed and treated if necessary [1,22].

Consider referral to a urologist and hospital admission for patients with [1,56]:

- Severe pain or fever.
- Signs of a systemic infection.
- Orchalgia/epididymalgia.
- Inability to comply with an antimicrobial regimen.
- Persistent symptoms.
- Other diagnoses suspected (see alternative diagnoses in *Section 9.6.3*).

9.6.5 Contact Tracing

Contact tracing is not required for non-STIs epididymitis/epididymo-orchitis [22] [**L2**]. Sexual partners of patients with STIs should be traced back. Refer to relevant sections for recommendations and tracing periods:

- *N. gonorrhoeae* (see *Section 8.2.5*).
- *C. trachomatis* (see *Section 8.4.5*).
- *M. genitalium* (see *Section 8.8.5*).

9.6.6 Follow-Up and Test of Cure

Clinical response to treatment should be determined within 1 week (preferably within 3 days) after the initiation of treatment [1,55,56]. Symptoms should improve within 2-5 days, but residual pain and swelling may persist for several weeks [56].

For TOC and retesting recommendation refer to relevant sections:

- *N. gonorrhoeae* (see *Section 8.2.6*).
- *C. trachomatis* (see *Section 8.4.6*).
- *M. genitalium* (see *Section 8.8.6*).

10 Key Considerations for Patient Preferences

Patient preferences refer to patient perspectives, beliefs, expectations, and goals for health and life, and to the steps employed by individuals in assessing the potential benefits, harms, costs, and limitations of the management options in relation to one another. Patients may have preferences when it comes to defining their problems, identifying the range of management options and selecting or ranking the outcomes used to compare these options.

It is important for healthcare professionals to develop an understanding of the patient as an individual and the unique way in which each person experiences a condition and its impact on their life.

The following recommendations are therefore made for physicians and other healthcare professionals regarding general principles of patient care in Qatar:

- **Respect Patients:** Treat patients with respect, kindness, dignity, courtesy and honesty. Ensure that the environment is conducive to discussion and that the patient's privacy is respected, particularly when discussing sensitive, personal issues. Ask the patient how they wish to be addressed and ensure that their choice is respected and used.

- **Maintain Confidentiality:** Respect the patient's right to confidentiality and avoid disclosing or sharing patients' information without their informed consent. In this context, students and anyone not directly involved in the delivery of care should first be introduced to the patient before starting consultations or meetings, and let the patient decide if they want them to stay.

- **Clarify Third-Party Involvement:** Clarify with the patient at the first point of contact whether and how they like their partner, family members or carers to be involved in key decisions about their care or management and review this regularly. If the patient agrees, share information with their partner, family members or carers.

- **Obtain Informed Consent:** Obtain and document informed consent from patients, in accordance with MOPH policy and guidance.

- **Encourage Shared Decision Making:** Ensure that patients are involved in decision making about their own care, or their dependent's care, and that factors that could impact the patient's participation in their own consultation and care including physical or learning disabilities, sight, speech or hearing impairments and problems with understanding, reading or speaking English are addressed.

- **Disclose Medical Errors:** Disclose errors when they occur and show empathy to patients.

- **Ensure Effective Communication:** Explore ways to improve communication including using pictures, symbols or involving an interpreter or family members. Avoid using medical jargon. Use words the patient will understand and confirm understanding by asking questions.

- **Ensure Continuity of Care:** Provide clear and timely sharing of patient information between healthcare professionals especially at the point of any transitions in care.

11 Performance Measures

A list of potential performance measures is given below in *Table 11.1* [59].

Measure Ref	Numerator	Denominator
STI01	Number of sexually active adolescents, in whom a sexual history has been taken in the last 12 months.	Number of sexually active adolescents seen in the last 12 months.
STI02	Number of men diagnosed with Non-gonococcal urethritis in the last 12 months who are tested for HIV and syphilis.	Number of men diagnosed with Non-gonococcal urethritis in the last 12 months.
STI03	Number of women diagnosed with bacterial vaginosis in the last 12 months in whom an STI screen has been performed.	Number of women diagnosed with bacterial vaginosis in the last 12 months.

Table 11.1: Performance Measures.

12 References

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Appendix: Detailed Description of the Literature Search

The present National Clinical Guideline was developed based on an unpublished document developed by the Public Health Department of the Ministry of Public Health. The document has been used as a guide to current clinical practice processes in Qatar and has been supplemented with other relevant studies.

Recommendations from the Public Health guideline were checked against international clinical practice guidelines, peer-reviewed scientific articles and other publications found in the *PubMed* database and on websites of relevant organisations and societies including the *Wold Health Organisation (WHO), Melbourne Sexual Health Centre, British Association for Sexual Health and HIV, International Union against Sexually Transmitted Infections (IUSTI), Australian Sexual Health Alliance (ASHA), American Academy of Family Physicians (AAFP),* and other.

The search for existing literature was performed in the period August 18th – September 15th, 2020. The included publications were identified using the following terms and their combinations:

Guideline, adolescent, pregnant, women, men, prevalence, Qatar, assessment, screening, prevention, investigation, (differential/alternative) diagnosis, examination, classification, management, sexually transmitted infection/disease, gonorrhoea, syphilis, chlamydia, chancroid, donovanosis, lymphogranuloma, mycoplasma, trichomoniasis, genital wart(s)/ulcer(s), herpes, herpes simplex, urethritis, cervicitis, vaginal/urethral discharge, pelvic inflammatory disease, PID, epididymitis, epididymo-orchitis, treatment, follow-up, performance, quality measures/standards.

Figure A.1 on the next page demonstrates graphically the results of the search and application of exclusion criteria.

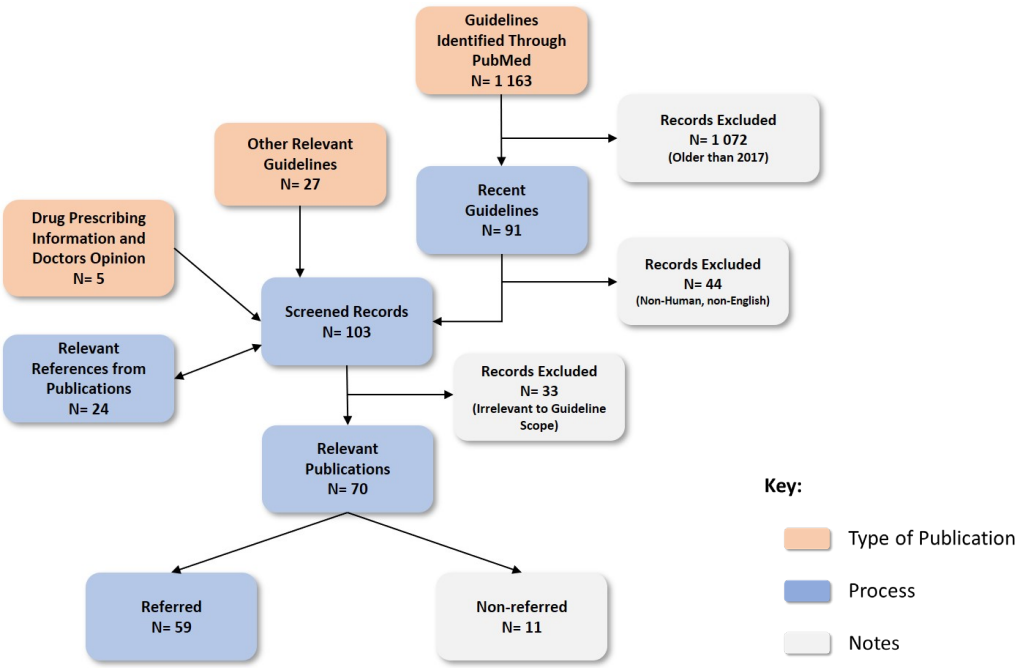

Fig A.1: Literature search results and application of exclusion criteria.

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